

**Gender Differences in Control Intervention Use: A Population-Based Cohort Study of  
Acute Psychiatric Hospital Patients in Ontario, Canada between 2006-2018**

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.

# GENDER DIFFERENCES IN RESTRAINT USE

## Abstract

**Background:** Both gender differences (GDs) have been explored in various areas of mental health including disease epidemiology, treatment, risk factors and community engagement. However, few articles examine GDs in quality of mental health care and even fewer studies of quality mental health care examine process indicators.

**Methods:** This population-based cohort study examined GDs in CIs among the adult acute inpatient psychiatry admissions in Ontario. The first aim of this study is to understand patterns of a process indicator over time by gender. The process indicators selected were control interventions (CIs) applied among inpatients in acute psychiatric settings across Ontario. The second aim is to investigate which demographic, clinical and behavioural factors are associated with the use of CIs for men compared to women.

**Analysis:** Data from the Ontario Mental Health Reporting System (OMHRS), based on the RAI-Mental Health Assessment System (RAI-MH) tool, was collected from every adult patient admitted to psychiatry units in Ontario. De-identified data from patients admitted between 2006-2018 were collected from CIHI, according to their data sharing agreement. Both a gender-stratified descriptive analysis, and a multivariable logistic regression were performed to understand the GDs in demographic, clinical and behavioural factors associated with the application of CIs.

**Results:** Use of both restraint and confinement was more common among men compared to women. In addition, the logistic regression identified that odds of restraints/confinement are increased by levels of aggression, mania symptoms, interpersonal conflict, neurocognitive disorders, stimulant use and age for both men and women. Men were at a greater odds of CIs for stimulant use, neurocognitive disorder, mania, interpersonal conflict and moderate risk of harm to others. At the highest level of risk of harm to others, and when exhibiting wandering and elopement behaviours, women were at a greater odds of experiencing CIs. Abnormal thoughts, involuntary admission and history of criminal activity being associated with CI use for men only. Hallucinations were associated with CI use for women, but not men. The odds of CI use were decreased by history of trauma, challenging social relationships, and self-harm behaviours for both genders. Overall, these results identified GDs in patterns of restraint/confinement use among psychiatric inpatients and supports the continued aim to employ least-restraint approaches in across mental health systems in Ontario, as well as evidence of the application of behaviour-based assessment tools in preventing/mitigating the use of CIs.

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### **Dedication**

To the women who came before me, Teia, Aurea and Rute, who fought for education and uplifted their families. I only dare to dream because of your victories.

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### Abbreviations List

ABS	Aggressive Behaviour Scale
Conflict CAP	Interpersonal Conflict Clinical Assessment Protocol
CPS	Cognitive Performance Scale
CI	Control Intervention
Criminal CAP	Criminal Activity Clinical Assessment Protocol
DSI	Depression Severity Index
GD	Gender Difference
Harm CAP	Harm to Others Clinical Assessment Protocol
IOM	Institute of Medicine
InterRAI*	International Resident Assessment Instrument*
MANIA	Mania Scale
OMHRS	Ontario Mental Health Reporting System
PSS	Positive Symptoms Scale
QI	Quality Indicator
RAI-MH Scales	Resident Assessment Instrument-Mental Health Scales
RHO	Risk of Harm to Others Scale
SOS	Severity of Self-Harm Scale
Self-Harm CAP	Suicidality and Purposeful Self-Harm Clinical Assessment Protocol
Trauma CAP	Traumatic Life Events Clinical Assessment Protocol
WHO	World Health Organization

*Note: \*Refers to both the international organization responsible for developing comprehensive clinical assessment systems and the suite of clinical assessments available*

## 1.0 Introduction

Achieving high quality mental health care involves identifying and resolving issues of equity. While there are numerous studies examining sex and gender differences in mental health, few articles examine these gender differences (GDs) in relation to the quality of mental health care. Good quality of care is defined as “the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” (Funk, Lund, Freeman, & Drew, 2009; Institute of Medicine, 2006). There is a need for sex and gender-based analysis (SGBA) in understanding whether desired mental health outcomes are achieved equitable for both men and women. SGBA involves examining the effects of both sex, the biological differences between males and females, such as chromosomal or physiological differences, and gender, the social, cultural and behavioural constructs associated with having a particular sex (Canadian Institutes of Health Research, 2019). The terms sex and gender have been used interchangeably in mental health research. Throughout this study, an assumption was made that while physiological sex differences may influence how medications are metabolized, mental health care more often addresses and interacts with psychological and behavioural constructs, suggesting that gender, not sex, would influence the quality of care. Therefore, most studies evaluated in this review, with the exception of those assessing GDs in medication metabolism, were considered to be investigating the social constructs of gender between men and women, despite sometimes employing the sex terms “male” and “female”.

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### 1.1 Gender Differences in Mental Health Literature

A wealth of literature exists on GDs in the diagnosis and presentation of mental health disorders. For example, major depressive disorder has been consistently reported in higher rates among women (Picco, Subramaniam, Abdin, Vaingankar, & Chong, 2017). Beyond diagnoses, GDs also exist in the severity and comorbidity of mental health disorders. For patients living with psychotic disorders, women have been reported to experience higher rates of comorbid anxiety, hallucinations and delusions, compared to men (Deligiannidis et al., 2013). GDs may also exist within secondary clinical factors of mental health patients. In an assessment of GDs among emergency department patients, a higher proportion of women were found to have a history of abuse, depressive disorders, self-harm behaviours, and personality disorders; in comparison, men were reported to have a more diagnoses of anxiety, bipolar, schizophrenia-spectrum, and substance disorders (Juhas & Agyaponga, 2016). Expressions and outcomes of mental health conditions may differ by gender. For instance, men and women experience and express psychosis differently, with men demonstrating higher rates of disability and more trouble integrating into the community in comparison to women (Morgan, Castle, & Jablensky, 2008).

GDs in the presentation of mental health disorders can influence how they are assessed and treated. In a cohort of 352 patients, predictors of depression were found to function differently between male and female participants. Women were more likely to experience and relapse into depressive episodes. As well, a history of a suicidal attempt was predictive of a depressive episode for women, but not for men (Oquendo et al., 2013). However, among persons with schizophrenia, men presented with psychotic symptoms earlier than women, with worse functioning prior to diagnosis and a greater incidence of negative symptoms (Segarra et al., 2012). While women were more likely to experience acute stress one year prior to presenting

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with psychotic symptoms and presented with more affective symptoms compared to men. Interestingly, even with onset of psychosis being differing between men and women, these GDs did not seem to affect outcomes two years after the onset of treatment (Segarra et al., 2012). Therefore, the presentation, diagnosis, and progression, even within the spectrum of a single disorder, vary between men and women, as well as across disorders.

Some gender-based differences have also been reported in the pharmacological treatment of mental health disorders. For example, men are more likely to be non-compliant in their treatment regimens, experience involuntary admissions, and have poorer response to treatment (Juhas & Agyaponga, 2016). Many studies also suggest differential gender patterns in drug use, dependence and rehabilitation outcomes between men and women. For example, while men report high rates of stimulant drug use, when it comes to withdrawal, they are less symptomatic and have better treatment outcomes. In contrast, women reported lower rates of substance use, but greater severity of withdrawal symptoms including greater issues with eating, sleeping, mood and anxiety (Chartier et al., 2015). A similar study on cocaine use established that women demonstrated worse responses to treatment due to the ineffectiveness of the treatment drug (disulfiram) (Devito, Babuscio, Nich, Ball, & Carroll, 2014). This finding was not exclusive to stimulants, as confirmed by a study on cannabis withdrawal, which found that women reported greater mood and gastrointestinal discomfort with respect to men (Herrmann, Weerts, & Vandrey, 2015).

Some researchers have attributed these GDs to discrepancies in emotional processing and expression that may play a role in mental illness and recovery (Judd, Armstrong, & Kulkarni, 2009). Others explore larger systematic issues in research as being responsible for these observed differences. For example, women have been largely underrepresented in pharmacological

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studies, especially those of childbearing age. These exclusions limit our knowledge of how effectively medications work in both genders across the lifespan, but seem to affect women disproportionately (Judd et al., 2009). For example, changes that are unique to women, such as menstruation, menopause or pregnancy, may also influence mental health risk, in addition to, treatment and medication effectiveness. In a study examining the effectiveness of two antidepressants, menopausal status was found to alter the efficacy of the drug in women. Similarly, pregnancy is also considered a period of vulnerability to the onset or relapse of mental health disorders and decreased gastrointestinal retroflexion, which impairs effectiveness of medications (Vermeiden, van den Broek, Mulder, & Birkenhäger, 2010).

There may also be nuanced differences in how gender influences engagement in mental health programs. In the study aforementioned, women demonstrated poorer response to cocaine-withdrawal treatment due to the ineffectiveness of the treatment drug (disulfiram), but the same study found no significant differences in relation to the behavioural treatment outcomes between men and women, only pharmacological outcomes (Devito et al., 2014). Mental health programs that consider gender-specific needs are also valuable in illustrating how these differences impact care. For example, one study on the effectiveness of community social programming found that older men had low rates of involvement in mental health programs. However, participation of older males increased once male-focused mental health programs, with both learning and social aspects, were introduced. Investigators also found that recruiting for these programs before the age of retirement was pivotal in maintaining engagement beyond retirement (Reynolds, Roger, Nurmi, Urquhart, & Mackenzie, 2016). This finding is consistent with other community mental health studies, where men are evaluated as being more resistant to intervention, living alone, having less social supports, and engaging in substance use (Forchuk et al., 2009).

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### 1.2 Gender Differences in Quality of Mental Health Care Literature

While GDs in mental health care are available, studies specifically examining GDs in the quality of mental health care are more scarce. In a review of literature, seven articles examining gender and quality of care in a mental health context were identified (See [Appendix B Table 12, Figure 7](#)). When comparing GDs across mental health quality indicators, the majority of articles fell into one of three categories: patient satisfaction, clinical care and access. Among these studies, quality of care was often examined through either surveys, interviews or clinical practice guidelines. Five studies used either existing or newly collected data from practitioner, patient and national samples to evaluate care quality (Barker, Kurdyak, Jacob, & Vigod, 2018; Lam et al., 2017; Moore, Mompe, & Moy, 2018; Verdoux, Boulon, & Cougnard, 2008). The remaining two studies employed cohort study designs (Bener & Ghuloum, 2013; Robillos, Lale, Wooldridge, Heller, & Sarkin, 2014), with one using qualitative methods to assess patient perceptions of their care experiences (Bener & Ghuloum, 2013). Four studies were conducted using samples from the United States, and the other three studies were conducted using samples from Qatar, France and Canada. The quality indicators examined were patient satisfaction, appropriate follow-up care, clinical practices, timely receipt of care, adherence to clinical guidelines, proper monitoring, care access, adequate screening, and prescribing behaviours among professionals ([Appendix B, Table 12](#)).

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### 1.2.1 Quality Indicators: Patient Satisfaction in Mental Health Care

GDs in patient satisfaction were reported in two studies. Among these studies, men reported greater satisfaction compared to women. For instance, Bener and Ghuloum (2013) found gender and age may be related to satisfaction levels, with younger men reporting greater satisfaction with psychiatric care compared to women. Men also had greater expectations of their physicians in terms of providing insight to their condition, managing their symptoms and involving them in treatment decision-making (Bener & Ghuloum, 2013). Another nationally representative study of quality care established a stronger positive relationship between overall satisfaction and access to services, social connectedness and improved functioning for men rather than women (Robillos et al., 2014). Patient satisfaction measures consistently reported higher quality of care for men, rather than women. It appeared that men also have higher expectations of care. These differences could be explained by how men and women navigated the mental health system and negotiated their needs. Some literature suggested that women had a higher risk of adverse experiences in care, such as sexual assault in acute psychiatric settings. In some cases, women also reported their mental health concerns being met with disbelief or trivialization (Judd et al., 2009). This finding was surprising as men reported accessing mental health services with less often, while women tended to be more proactive in seeking supports.



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### 1.2.2 Quality Indicators: Appropriate Clinical Mental Health Care

The majority of articles examining gender and quality of mental health care examined different clinical predictors of quality of care. The Canadian study, examining quality of diabetic care among men and women with psychotic illnesses, identified that 75% of individuals with psychotic illness did not receive the minimum number of diabetes-related tests as recommended by national guidelines. Women were more likely to receive adequate diabetic care than men (Barker et al., 2018) demonstrating an effect opposite to that of the patient satisfaction studies. Minimum care was defined as having at least four blood tests, one retinal exam and one dyslipidemia test within a 2-year period. As exams require patient attendance and compliance, this finding could be attributable to men being less adherent to treatment regimens compared to women (Juhás & Agyaponga, 2016). A study by Verdoux and colleagues examining the quality of clinical practices, explored whether patient and/or clinician characteristics influenced the application of metabolic monitoring guidelines of patients experiencing second-generation antipsychotics (SGAP) (Verdoux et al., 2008). Prior to experiencing a SGAP prescription, a number of metabolic tests are recommended to ensure efficacy of the medication. Follow-up tests are also recommended to ensure ongoing success of the drug. There are eleven tests ranging in complexity, from taking height and weight to requesting a blood cholesterol test. Investigators found that the number of metabolic parameters assessed prior to antipsychotic prescription was significantly lower in females and the patient gender was the only characteristic accounting for the discrepancy. In other words, no clinical or biological characteristics supported the use of fewer parameters (Verdoux et al., 2008). In another evaluation of QIs, Lam et al. examined the quality of depression care among veterans and found better care for women which was defined as adequate follow-up, appropriate prescribing, psychotherapy visits, specialist visits and

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diagnostic evaluation within 180 days of a first visit for depression (2017). In summary, these studies suggest a discrepancy in adequate care and monitoring.

Differences in treatment protocols of men and women have also been identified in other sources. For example, in a Swedish sample, investigators found that men with bipolar disorder were often treated with lithium, whereas women with the same disorder were treated with one or more antidepressants, lamotrigine, electroconvulsive therapy, benzodiazepines, and psychotherapy. While these differences may be a result of clinician and patient preferences, authors stated that there were no clinical or diagnostic characteristics to merit these decisions, suggesting that patient gender may influence clinician decisions about treatment (Karanti et al., 2015). Similarly, Verdoux et al. found that clinician decision-making was influenced by the patient's gender, rather than an evidence-based rationale. This is not to say that GDs in medication response do not exist; physiological sex differences accounting for differences in medication response have also been documented in literature. A study of antipsychotic prescription in veterans identified greater side effects occurring in women and this study found that accounting for these differences in prescribing patterns was as a means to mitigate these side effects (Charlotte et al., 2015; Schwartz et al., 2015). However, these discrepancies suggest an increased need for high quality evidence-based care in the areas of medication management, psychotherapeutic intervention and progress monitoring in mental health care. Finally, a study attempting to identify variables characterizing both helpful and unhelpful experiences in therapy-seeking LGBT patients found that client-level variables, service-level variables and therapist behaviors affected experiences of LGBT individuals in therapy. Variables associated with helpful therapy experiences included type of practitioner, referral source, practice setting, practitioner response to client sexual orientation and accommodating client needs.

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### 1.2.3 Quality Indicators: Mental Health Care Access

A study analyzing GDs and trends in health care access as a part of the National Quality Strategy, found that women received worse mental health care than men 20% of the time and equal or better care 80% of the time. However, women also experienced more barriers to care, in particular financial barriers or inconsistent health coverage. Where women achieved the same mental health outcomes as men, they also received more services to achieve these similar outcomes (Moore et al., 2018). However, men reported accessing mental health services less frequently, due to stigma and mistrust of the system (Ojeda & Bergstresser, 2008). While women may not access care due to external barriers, such as limited finances. LGBTQ+ patients also avoid accessing services due to mistrust rooted in discriminatory practices relating to their sexual orientation. In an Irish sample of LGBTQ+ adults, qualitative analyses revealed that due to lack of practitioner knowledge on LGBTQ+ issues, only 37% of patients were not comfortable sharing their gender and sexual orientations with their practitioners (McCann & Sharek, 2014). Therefore, financial barriers, stigma and discrimination were identified, through an analysis of QIs, as gender-related barriers to accessing mental health care.

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### 1.3 Gaps in Quality of Mental Health Care Research

All quality indicators fall into one of three categories: structure, process and outcome factors. Structure measures relate to systematic issues, such as access to care. Process measures include actions influencing provision of care, such as interventions implemented during a hospital stay. Finally, outcome measures are developed and based on common assessment systems, they provide feedback on performance and may include patient outcomes or satisfaction (Donabedian, 1966).

Process measures were limited in this literature review and as such, will be the focus of this thesis. Understanding process measures in quality of care provides potential areas of improvement that can be targeted to achieve desired outcomes. Good process measures, or indicators, often relate to larger goals of quality and are identified through empirical research and evaluation. One example is the Quadruple Aim, which is a framework by which to improve quality of care by targeting four factors: patient experiences, population health, reducing costs and well-being of the health care team (Berwick, Nolan, & Whittington, 2008). These four areas work synergistically as improvements in one area affect the other three. According to the Quadruple Aim, effective improvements in care require a defined population and depend on supportive policies, adequate resources and responsive feedback indicators for continual progress. Another similar framework involves the six dimensions outlined by the IOM: “safety, effectiveness, patient centeredness, timeliness, efficiency, and equity” (Berwick et al., 2008). Within these dimensions and frameworks, a number of variables may exist that can measure quality of health care and even act as targets for improvement, these are known as quality indicators.

A number of mental health quality indicators (QIs), also known as performance

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indicators, have been identified in literature. A recent report by the Centre for Applied Research in Mental Health and Addictions (CARMHA) identified 63 meaningful mental health QIs (Jones, Goldner, Butler, & McEwan, 2015). A systematic inventory identified 1480 unique QIs, many of which were related to the processes of delivering mental health care (Lauriks, Buster, De Wit, Arah, & Klazinga, 2012). QIs are used to gage the effectiveness and efficiency of mental health care, by answering questions regarding use, misuse, overuse or underuse of services (Farquhar, 2008). Some examples of mental health QIs include hospital readmissions within 30 days of discharge, utilization of outpatient services and patient satisfaction (Butler et al., 2017; Jones et al., 2015). High hospital readmission rates, for example, could indicate inadequate provision of resources in-hospital or poor discharge planning and initiate a response from administrators to improve the performance of the hospital. While the majority of mental health services in Canada are provided through publicly funded avenues, the application of QIs is not consistent across the nation. While there are efforts to standardize quality of care measures across the country, such as the interRAI consortium, development of QIs often varies by context, organization and necessity (Lauriks et al., 2012). Mental health quality indicators can be derived from existing assessments, patient feedback, facility resources processes of care or outcomes. Well-established QIs may translate into clinical care through the development of care standards that ensure quality is maintained in practice. Standards of care have been developed different areas of mental health for the following problem areas: managing depression and/or anxiety disorders, transitions between inpatient mental health settings and home; and schizophrenia care in the community (Health Quality Ontario, 2019). For the purposes of this thesis, the QI selected will be control intervention use, as it is both a QI and standards of care already exist for this in-hospital process.

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### 1.4 Control Interventions as a Process Measure in Acute Psychiatry

As a well-established QI, the use of control interventions (CIs) is a good process indicator to explore GDs in acute psychiatric care. CIs are an interesting variable because their use involves difficult judgment calls based on staff perceptions of and interactions with the patient. CIs encroach on patient autonomy and can generate both patient and staff safety issues. The complexity of this in-hospital process makes it an interesting variable for a gender-based analysis and a good variable for examining quality of mental health care because reductions in QIs are already established as a quality-of-care goal in psychiatric settings.

CIs are used in several areas of medicine to limit movement of an individual who pose an acute risk of harm to themselves or others (Negroni, 2017). CIs may involve physical, mechanical and chemical restraints as well as confinement. Physical restraints involve staff limiting movement by making physical contact with the patient (Mah, Hirdes, Heckman, & Stolee, 2015). The terms physical and mechanical restraint are sometimes used interchangeably, however, mechanical restraint can be distinguished as limiting patient movement through the use of a mechanism, such as a belt, chair-that-prevents-rising, elevated bed rails and other devices. Chemical restraints are medications provided to temporarily sedate or tranquilize patients with the goal of behaviour management (Mah et al., 2015). Finally, several forms of confinement are also considered CIs and include preventing patients from leaving a room, unit and/or remaining under observation, which is also referred to as time spent in a seclusion room (Negroni, 2017).

The use of restraints is controversial, and there has been a movement towards employing behaviour management techniques and minimizing the use of CIs. These behaviour management techniques focus on understanding the patient's needs and manipulating their surroundings to create a safer environment for both staff and patients (College of Nurses of Ontario, 2018). One

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reason why restraint use is contested lies in the potential for subjectivity behind the decision to restraint. Restraint and confinement use may also worsen patient outcomes, in particular for patient with a history of trauma and/or self-harm (Emmanuel et al., 2013). Best practices have moved towards a least restraint approach, to improve patient outcomes, and to mitigate the disproportionate restraining patients with younger age, an immigrant background, bipolar and personality disorders (Dumais, Larue, Drapeau, Ménard, & Giguère Allard, 2011; Knutzen, Sandvik, Hauff, Opjordsmoen, & Friis, 2007). However, evidence suggests that CIs continue to be used as an automatic response for disruptive behaviour, rather than for their intended use: responding to acute safety issues. More research is needed to evaluate how restraint and confinement use as changed over time, since the advent of these least-restraint policies in the early 2000s (College of Nurses of Ontario, 2018). This discrepancy makes CIs an ideal process measure to examine GDs because some studies suggest a higher rate of restraint in males, other studies suggest higher restraint use in females (Dumais et al., 2011). Yet, other studies suggest no relationship between restraint and gender, however, a few studies have alluded to associations between gender and other variables, many of which remain unexplored (Dumais et al., 2011; Knutzen et al., 2007).

### 1.5 Purpose

The purpose of this study was to investigate GDs in the quality of mental health care using the CIs as a quality indicator. The first aim was to evaluate patterns of CIs over time by gender, and the second aim was to identify which demographic, behavioral and clinical characteristics are associated with the application of CIs for men compared to women.

## **2.0 Methods**

### **2.1 Data Source**

Data from inpatient mental health visits were obtained from the Ontario Mental Health Reporting System of the Canadian Institute for Health Information (OMHRS). The OMHRS is based on the RAI-Mental Health Assessment System (RAI-MH), which is a valid and standardized instrument for assessing persons admitted to inpatient psychiatric settings (Hirdes et al., 2008, 2002, 2020). This instrument was developed by global experts through a series of systematic steps, including research, application and evaluation, to address the broad needs of psychiatric populations (Hirdes et al., 2002). The RAI-MH is administered by trained health care professionals across 14 different facilities and acceptable reliability cut-offs were established using conservative methods across all domain areas (Hirdes et al., 2002). The Ontario Ministry of Health and Long-Term Care has mandated that the RAI-MH be completed for adults admitted to inpatient psychiatry. The data are stored and managed by the Canadian Institute for Health Research (Canadian Institute for Health Information, 2019). Items are assessed over a 3-day period by trained medical staff, and may include statements by the patient, family accounts, provider interactions or medical history, strengthening the validity of the assessment (Hirdes et al., 2002). The RAI-MH includes a number of sub-scales, which have been validated against existing assessments, to assess different aspects of mental health symptoms, functions and outcomes.



### 2.2 Study Population

The study population included adults, aged 18 and over, admitted to acute inpatient psychiatric beds in Ontario between 2006-2018, with no prior admissions. De-identified data from patients were available from CIHI and the most recent admission and discharge for each patient was isolated for analysis. Patients with forensic admissions were excluded as their care trajectories are determined by the judicial system and differ from community mental health admissions.

The gender distribution within the OMHRS data is evenly split between men and women, making it an ideal sample for assessing gender differences (GDs). The population is representative of patients admitted to acute inpatient psychiatry in Ontario. This dataset includes close to no non-response bias as the assessments are mandated and conducted for every admission by a health care professional. The exception is patients who leave against medical advice, however, this accounts for less than 1% of the population.

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### 2.3 Independent Variables

#### 2.3.1 Demographic Variables

##### 2.3.1.1 Age

The continuous age variable was collapsed into six categories, 18-24, 25-34, 35-44, 45-54, 55-64 and 65+, with age group 18-24 as the reference variable. Patients younger than 18 years were removed from the sample they would be cared for in child psychiatric units, with different resources and supports available. These cut-offs were based on cut-offs traditionally used in previous literature, however, alternative cut-offs as well as a continuous variable could have been used.

##### 2.3.1.2 Gender

The dataset included male, female and other. Male and female were re-labelled as men and women, respectively, to reflect a gender variable. Patients identifying as “other” were not included as they accounted for only 0.0003% of the population (n=22) with only two of these patients experiencing CIs (one restraint and one confinement), preventing any statistically/clinically significant analysis. In addition, due to residual disclosure in deidentified data, analysis of cell counts below five cannot be done as these patients could be identify, jeopardizing patient privacy.

##### 2.3.1.3 Marital Status

Marital status was collapsed into three categories: never married, married and separated, which included divorced or widowed, with never married as the reference variable. Married and partner/significant other were collapsed into the married category. These variables were included as proxies to capture support systems which may be available to patients. An alternative category would have been to separate widowed and separated

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patients as the support systems of widowers differ from their separated or divorced counterparts as the nature of their loss may not include interpersonal conflict with family members and isolation.

### *2.3.1.4 Living Status*

Living status was collapsed into three categories, lived alone, lived with others and homeless, with homelessness as the reference variable. “Lived with others” included lived with spouse only, lived with spouse and other(s), lived with children, lived with others and lived in a group setting. These variables were included as proxies to capture support systems which may or may not be available to patients.

### *2.3.1.5 Employment Status*

Employment status was collapsed into three categories: unemployment, employed and other, with unemployment as the reference variable. “Unknown” employment status was removed as it only accounted for 2.5% of patients and was not descriptive.

### *2.3.1.6 Education*

Education status was captured in three categories: completed less than high school, completed high school or pursued post-secondary education, with less than high school education as the reference variable. “Less than high school” included no schooling, grades 8 or less and grades 9-11. “Pursued post-secondary education” included technical or trade school, some college/university, diploma/bachelor’s degree and graduate school.

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### 2.3.2 Primary Diagnosis

The RAI-MH captures diagnostic categories from the Diagnostic and Statistical Manual of Mental Disorders (DSM); these diagnoses are assigned and/or confirmed by the psychiatrist overseeing the care of the admitted person. Admissions prior to 2016 were coded using the previous version of the DSM, the DSM-IV. Admissions after 2016 were coded using the current DSM-V (American Psychiatric Association, 2000, 2013). To account for this change, categories in the DSM-V were cross-walked to their correlated variable in the DSM-IV. Primary diagnoses under 5% prevalence were collapsed into an “Other Diagnosis” category, with the exception of Neurocognitive and Neurodevelopmental Disorders. The final diagnoses categories included Substance Use, Schizophrenia, Mood Disorders, Anxiety Disorder, Personality Disorder, Neurocognitive and Neurodevelopmental Disorders. These variables were dichotomized as having a primary diagnosis and not having a primary diagnosis.

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### 2.3.3 Clinical Symptoms and Scale

Hallucinations, command hallucinations, delusions and abnormal thoughts were included as dichotomous variables, indicating presence of the symptom in the last three days or absence of the symptom. Scales were categorized into low, moderate and high levels.

#### 2.3.3.1 *Cognitive Performance Scale (CPS)*

The CPS ranges from 0-6, with higher scores indicating more severe cognitive impairment by considering memory, decision-making and communication. The CPS was converted into a categorical variable with three groups, 0-2, 3-4 and 5-6.

#### 2.3.3.2 *Positive Symptom Scale (PSS)*

The PSS ranges from 0-12, with higher scores indicating higher number and frequency of the following positive symptoms: hallucinations, command hallucinations, delusions and abnormal thoughts. The PSS was converted into a categorical variable with three groups, collapsing scales into 0-2, 3-6 and 9-12.

#### 2.3.3.3 *Depressive Severity Index (DSI)*

The DSI ranges from 0-15, with higher scores indicating more severe impairment due to depressive symptoms, this scale considers affect, negative statements and feelings of hopelessness. The DSI was converted into a categorical variable with three groups, collapsing scales into 0-2, 3-8 and 9-15.

#### 2.3.3.4 *Mania Scale*

The Mania Scale ranges from 0-18, with higher scores indicating more severe manic symptoms. This scale sums six items including: inflated self-worth, hyper-arousal and increased sociability. The Mania Scale was converted into a categorical variable with three groups, collapsing scales into 0-2, 3-5 and 6-18.

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### 2.3.4 Behavioural Variables

The RAI-MH includes a number of items assessing behaviours and violence, such as wandering, verbal abuse, physical abuse, disruptive behaviour, inappropriate sexual behaviour, resisting care and elopement attempts. These items are combined into several sub-scales, such as the Aggressive Behaviour Scale and Risk of Harm to Others Scale (see [Appendix A, Table 10](#)). Wandering and elopement, which are not included in any scale, were left in their original increments: no incident of the behaviour, incidents of the behaviour, but not in the last three days incidents of the behaviour within the last three days and daily incidents of the behaviour.

#### 2.3.4.1 Substance Use

The RAI-MH includes items on the recent of the use of inhalants, hallucinogens, cocaine, stimulants, opiates, cannabis, problematic alcohol use, smoking and misuse of medication. Each category was dichotomized into experienced/used in the last month or no experience/use in the last month. Additional substance use categories included withdrawal and misuse of medications.

#### 2.3.4.2 Risk of Harm to Others (RHO) Scale

The RHO scale ranges from 0-6, with higher scores indicating higher risk of harm to others by considering levels of violence and aggression (Neufeld, Perlman, & Hirdes, 2012). The RHO was converted into the three categorical groups, 0-2, 3-4 and 5-6.

#### 2.3.4.3 Severity of Self-Harm (SOS) Scale

The SOS scale ranges from 0-6, with higher scores indicating higher risk of self-harm and/or suicide by considering previous history of self-harm, depressive and psychotic symptoms (Hirdes et al., 2002). The SOS scale was converted into a categorical variable with three groups, collapsing scales into 0-2, 3-4 and 5-6.

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### 2.3.2.4 *Aggressive Behaviour Scale (ABS)*

The ABS ranges from 0-12, with higher scores indicating higher levels of aggression by considering verbal, abuse, physical abuse and other disruptive behaviours. The ABS was converted into a categorical variable with three groups, 0-2, 3-6 and 7-12.

### 2.3.2.5 *Clinical Assessment Protocols (CAPs)*

CAPs are designed to assist clinician decision-making as to whether and how to intervene with the individual by facilitating interpretation of key issues identified during the assessment process (InterRAI, 2020). The CAPs were retained in their original increments, ranging from 0-2 or 0-1. [Appendix A, Table 11](#) summarizes the CAPs used in this study. CAPs ranging from 0-2 included: harm to others (Harm CAP), suicidality and purposeful self-harm (Self-Harm CAP), interpersonal conflict (Conflict CAP), social isolation and family dysfunction (Social CAP), traumatic life events (Trauma CAP) and substance use (Substance Use CAP). Only the criminal activity dichotomous CAP (0-1) and indicates either the presence or absence of previous criminal activity.

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### 2.4 Dependent Variables

#### 2.4.1 Any Control Intervention

This variable includes application of any mechanical restraints, physical restraints, chair that prevents rising, confinement to a room or use of a seclusion room. All CIs were dichotomized as occurring in any duration (1) or not occurring at all (0). The variable “confinement to unit” was removed as the majority of inpatient psychiatric settings include locked units, nevertheless patients are free to move inside the unit. As a result, including the confinement to the unit as a whole could skew the analysis by inflating the prevalence of CIs. While data on chemical restraints was available in the dataset, they were not a focus of this study and thus not included in this variable or in the analysis.

#### 2.4.2 Mechanical Restraint

Mechanical restraint involves restricting patient movement by using a device, such as bed straps. The levels of mechanical restraint were dichotomized into any mechanical restraint applied (1) and no mechanical restraint (0).

#### 2.4.3 Chair that Prevents Rising

A chair that prevents rising is any chair that would prevent the patient from rising independently. The levels of this type of restraint were dichotomized into any chair restraint applied (1) and no chair restraint (0).

#### 2.4.4 Physical Restraint by Staff

Physical or manual restraint refers to limiting the patient’s movement through direct contact with the patient by a staff member. The levels of this type of restraint were dichotomized into any use of physical restraint (1) and no physical restraint (0).



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### 2.4.5 Confinement to a Unit

A patient confined to a unit cannot leave the hospital psychiatric unit or can only leave with special permission and/or restrictions. The frequency of this type of confinement was dichotomized into any confinement to a unit (1) and no confinement to a unit (0). This type of confinement was not included in some components of the analysis as the majority of inpatient psychiatric patients are confined to a unit in hospital for at least a portion of their admission. As such, this could artificially inflate the number of patients who are “confined”.

### 2.4.6 Confinement to a Room

Patients at risk of harming themselves are sometimes confined to an individual room on the psychiatric unit. These rooms may be monitored but do not fit criteria for “seclusion rooms”. The frequency of this type of confinement was dichotomized into any confinement to a room (1) and no confinement to a room (0).

### 2.4.7 Seclusion Room

Seclusion rooms are high security areas for patients who are a significant risk to others. These rooms are monitored, and staff enter on periodically to provide support to patients. The frequency of this type of confinement was dichotomized into any confinement to a seclusion room (1) and no confinement to a seclusion room (0).

### 2.4.8 Any Restraint

Dichotomous variables were also created to capture use of any type restraint. This variable includes application of any mechanical restraints, physical restraints and/or chair that prevents rising. This variable was dichotomized as occurring in any duration (1) or not occurring at all (0).

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### 2.4.9 Any Confinement

Dichotomous variables were also created to capture use of any type confinement. This variable includes confinement to a room or use of a seclusion room. Once again, confinement to a unit was not included as many inpatients are confined to a unit in hospital for at least a portion of their admission. This variable was dichotomized as occurring in any duration (1) or not occurring at all (0).

### 2.5 Analysis

The Office of Research Ethics at the University of Waterloo provided the ethics clearance for this study on May 26th, 2020 under the ORE file number 41965. All analyses were conducted using Statistical Analysis Software (SAS) 9.4. A descriptive analysis was conducted by generating frequency tables between gender, CIs, and demographic, diagnostic, behavioural and clinical variables. To understand patterns of CI use over time, graphical analysis was conducted between time in years, gender and types of CIs. This analysis was repeated with patients with SOS and RHO scores  $>3$  to assess whether those at higher risk of restraint differ in proportions of restraint, compared to those at lower risk ([Figures 2 and 3](#)). To evaluate GDs in CI use, a stratified multivariable logistic regression was performed for both genders, adjusting for demographic, behavioural and clinical factors, which were blocked separately. Variables that were not statistically significant, or having a p-value greater than 0.05, were removed at each block. The C-statistic was used to assess goodness-of-fit for the final models.

### 3.0 Results

#### 3.1 Gender Differences in Descriptive Analysis Findings

There were 55,013 first admissions occurring between January 1, 2006 and December 31, 2018. First admissions were selected to control for previous hospital exposure, rapport with staff or prior CI experiences that may influence interventions for more recent admissions. Descriptive characteristics of these patients can be found in [Table 1](#). The population was evenly divided between men (49.2%) and women (50.8%). Both the mean and median ages were 41 (SD=15) for men and 45 (SD=16) for women, with the largest proportion of patients falling between 45-54 for both genders. There were more women present in older age groups and more men in younger age groups. Over 60% of the first-admission acute psychiatric inpatient lived with others, with 35% and 33% of men and women living alone, respectively. Less than 4% of the sample reported homelessness, with men experiencing slightly higher proportions of homelessness (4.4%). Most patients were educated, with 45% of men and 52% of women having either completed or pursued some college/university education. Around 30% of both men and women completed high school and just under, 25% of men and 20% of women had completed less than a high school education. While men and women were employed in equal proportions (17%), a 62 % of men and 60% of women were unemployed.

The most common primary diagnoses among first-admission acute psychiatric inpatients were schizophrenia spectrum (43%) and substance use (34%) disorders. Among women the most common primary diagnoses were anxiety (3.9%), mood, (50.3%) personality (4.1%), other disorders (3.6%). Likewise, more women experienced elevated DSI scores in comparison to men. In contrast, men were diagnosed more often with schizophrenia-spectrum (40.6%),

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substance use (11%), neurocognitive (2.7%) and neurodevelopmental disorders (1.3%). Men also exhibited more individual symptoms for hallucinations, delusions and abnormal thoughts as well as scored higher on the PSS when compared to women. Based on scores on the CPS, the majority of patients experienced mild to no cognitive impairment; however, higher scores were more common among men compared to women. The proportions of men and women experiencing mania symptoms were similar.

Behavioural GDs were consistent with diagnostic trends. For example, substance use was more common among men than women, with the exception of medication misuse, in which case the number of women exceeded men by about 4%.

The proportion of men with aggressive, violent and disruptive behaviours exhibited by men was higher than women, as demonstrated by higher scores on the RHO, ABS and individual wandering/elopement behaviours. On the other hand, women score higher levels on the SOS scale more often than men. The CAPs mirrored trends in the individual behavioural disturbances as well. More men triggered the Harm to Others (16.9%), Substance Use (47.1%) and Criminal Activity (39.7%) CAPs, whereas women triggered Self-Harm (28.5%) and Trauma (8.8%) CAPs. The most notable GDs occurred in the Criminal Activity CAP, with 16% more men triggering this CAP than women and the Substance Use CAP, exhibiting a 12% discrepancy between the genders. Apart from criminal activity, the GD between men and women ranged from about 2-5%. Men and women exhibited similar rates at all levels of both the Social Relationship and Interpersonal Conflict CAPs.

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**Table 1 Descriptive Analysis of Adult Mental Health First-Admission Inpatient Characteristics, Ontario 2006 – 2018 (N = 55,013)**

	Demographic Characteristics		
	Men n=27069 (49.2)	Women n=27944 (50.8)	All n=55013 (100)
<b>Gender n (%)</b>			
<b>Age Mean/Median (SD)</b>	41/40 (15)	45/45 (16)	
<b>Age Distribution n (%)</b>			
18-24	4633 (17.1)	3612 (12.9)	8245 (15.0)
25-34	6125 (22.6)	4644 (16.6)	10769 (19.6)
35-44	4951 (18.4)	5157 (18.5)	10108 (18.4)
45-54	5327 (19.7)	6284 (22.5)	11611 (21.1)
55-64	3689 (13.6)	4681 (16.8)	8370 (15.2)
65+	2344 (8.7)	3566 (12.8)	5910 (10.7)
<b>Living Status n (%)</b>			
Homeless	1196 (4.4)	767 (2.7)	1963 (3.56)
Alone	9521 (35.2)	9299 (33.3)	18820 (34.2)
With Others	16352 (60.4)	17878 (64.0)	34230 (62.3)
<b>Marital Status n (%)</b>			
Never married	17687 (65.3)	12576 (45.0)	30263 (55.0)
Married or SO	5375 (19.9)	8630 (30.9)	14005 (25.7)
Widowed or Separated	4007 (14.8)	6738 (24.1)	10745 (19.5)
<b>Education n (%)</b>			
< High School	6775 (20.4)	5710 (25.0)	12485 (22.7)
High School	8026 (27.3)	7614 (29.3)	15640 (28.4)
> High School	12268 (45.3)	14620 (52.3)	26888 (48.9)
<b>Employment n (%)</b>			
Unemployed	17034 (62.9)	16688 (59.7)	33722 (61.3)
Employed	4769 (17.6)	4980 (17.8)	9749 (17.7)
Other	5266 (19.5)	6276 (22.5)	11542 (21.0)

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**Table 1 Con^t Descriptive Analysis of Characteristics of Adults at First Psychiatric Admission, Ontario 2006 – 2018 (N = 55,013)**

	<b>Clinical Characteristics</b>		
	<b>Men n=27069 (49.2)</b>	<b>Women n=27944 (50.8)</b>	<b>All n=55013 (100)</b>
<b>Involuntary Admission n (%)</b>	4507 (16.7)	4230 (15.1)	8737 (15.9)
<b>Hallucinations n (%)</b>	6126 (22.6)	4990 (17.9)	11116 (20.2)
<b>Command Hallucinations n (%)</b>	2053 (7.6)	1573 (5.6)	3626 (6.6)
<b>Delusions n (%)</b>	8525 (31.5)	7536 (27.0)	16061 (29.2)
<b>Abnormal Thoughts n (%)</b>	10564 (39.0)	9573 (34.3)	20137 (36.6)
<b>Primary Diagnosis n (%)</b>			
Substance Use	2973 (11.0)	1818 (6.5)	18814 (34.2)
Schizophrenia	10983 (40.6)	7831 (28.0)	24013 (43.7)
Mood Disorders	9971 (36.8)	14042 (50.3)	1896 (3.5)
Anxiety Disorder	805 (3.0)	1091 (3.9)	1568 (2.9)
Personality Disorder	421 (1.7)	1147 (4.1)	1717 (3.1)
Neurocognitive Disorders	719 (2.7)	691 (2.5)	4791 (8.7)
Neurodevelopmental Disorders	361 (1.3)	202 (0.7)	1410 (2.6)
Other	723 (2.7)	994 (3.6)	563 (1.0)
<b>Cognitive Performance Scale n (%)</b>			
0-2	25166 (93.0)	25922 (92.8)	51088 (92.8)
3-4	1222 (5.0)	1388 (4.5)	2610 (4.7)
5-6	634 (2.5)	681 (2.3)	1315 (2.4)
<b>Positive Symptoms Scale n (%)</b>			
0-2	15144 (56.0)	17478 (62.6)	32622 (59.3)
3-6	8600 (31.8)	7822 (28.0)	16422 (28.9)
7-12	3325 (12.3)	2644 (9.5)	5969 (10.9)

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**Table 1 Con^t Descriptive Analysis of Characteristics of Adults at First Psychiatric Admission, Ontario 2006 – 2018 (N = 55,013)**

	Clinical Characteristics Con^t		
	Men n=27069 (49.2)	Women n=27944 (50.8)	All n=55013 (100)
<b>Depression Severity Index n (%)</b>			
0-2	13543 (50.0)	11110 (39.8)	24653 (44.8)
3-8	10504 (38.8)	12198 (43.7)	14901 (41.3)
9-15	3022 (11.2)	4636 (16.6)	15459 (13.9)
<b>Mania n (%)</b>			
0-2	16397 (60.6)	16977 (60.8)	33374 (60.7)
3-5	4751 (17.6)	4908 (17.6)	7877 (17.7)
6-20	5921 (21.9)	6059 (21.7)	13762 (21.8)
<b>Substance Use n (%)</b>			
Recent Inhalant Use	227 (0.8)	104 (0.4)	331 (0.6)
Recent Hallucinogens	469 (1.7)	234 (0.8)	703 (1.3)
Recent Cocaine	2106 (7.8)	1335 (4.8)	3441 (6.3)
Recent Stimulants	1259 (4.7)	732 (2.6)	1991 (3.6)
Recent Opiates	1414 (5.2)	1156 (4.1)	2570 (4.7)
Recent Cannabis	7049 (26.0)	3970 (14.2)	11019 (20.0)
Problematic Alcohol Use	4214 (15.6)	2616 (9.4)	6830 (12.4)
Smoking	12656 (46.8)	9596 (34.3)	22252 (40.3)
Misuse of Medications	3406 (12.6)	4572 (16.4)	7978 (14.5)
Withdrawal	2738 (10.1)	1963 (7.0)	4701 (8.6)
Any Substance Use	8547 (31.6)	5206 (18.6)	13753 (25.0)

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**Table 1 Con^t Descriptive Analysis of Characteristics of Adults at First Psychiatric Admission, Ontario 2006 – 2018 (N = 55,013)**

	Behavioural Characteristics Con^t		
	Men n=27069 (49.2)	Women n=27944 (50.8)	All n=55013 (100)
<b>Individual Behaviours n (%)</b>			
Wandering	2826 (10.4)	2618 (9.4)	5444 (9.8)
Elopement	1932 (7.1)	1787 (6.4)	3719 (6.8)
<b>Risk of Harm to Others Scale n (%)</b>			
0-2	17607 (65.0)	20696 (74.1)	38303 (69.6)
3-4	4896 (18.1)	4446 (15.9)	9342 (17.0)
5-6	4566 (16.9)	2802 (10.0)	7368 (13.4)
<b>Severity of Self Harm Scale n (%)</b>			
0-2	16023 (59.2)	15121 (54.1)	31144 (56.6)
3-4	4343 (16.0)	4874 (17.4)	9217 (16.8)
5-6	6703 (24.8)	7949 (28.5)	14652 (26.6)
<b>Aggressive Behaviour Scale n (%)</b>			
0-2	22076 (81.6)	23488 (84.1)	45564 (82.8)
3-6	2377 (8.8)	2060 (7.4)	4437 (8.1)
7-12	2616 (9.7)	2396 (8.6)	5012 (9.1)
<b>Clinical Assessment Protocols n (%)</b>			
Harm to Others CAP			
0	16674 (61.6)	20164 (72.2)	36838 (67.0)
1	5829 (21.5)	4978 (17.8)	10807 (19.6)
2	4566 (16.9)	2802 (10.0)	7368 (13.4)
Suicidality and Purposeful Self-Harm CAP			
0	16635 (61.5)	15796 (56.5)	32431 (59.0)
1	3731 (13.8)	4199 (15.0)	7930 (14.4)
2	6703 (24.8)	7949 (28.5)	14652 (26.6)



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**Table 1** Con^t Descriptive Analysis of Characteristics of Adults at First Psychiatric Admission, Ontario 2006 – 2018 (N = 55,013)

	Men n=27069 (49.2)	Women n=27944 (50.8)	All n=55013 (100)
<b>Traumatic Life Events CAP</b>			
0	24210 (89.4)	22777 (81.5)	46987 (85.4)
1	1762 (6.5)	2713 (9.7)	4475 (8.1)
2	1097 (4.0)	2454 (8.8)	3551 (6.5)
<b>Social Relationships CAP</b>			
0	12824 (47.4)	12890 (46.1)	25714 (46.7)
1	7311 (27.0)	7646 (27.4)	14957 (27.2)
2	6934 (25.6)	7408 (26.5)	14342 (26.1)
<b>Interpersonal Conflict CAP</b>			
0	16582 (61.3)	17571 (62.9)	34153 (62.1)
1	7055 (26.1)	6936 (24.8)	13991 (25.4)
2	3432 (12.7)	3437 (12.3)	6869 (12.5)
<b>Criminal Activity CAP</b>			
0	16334 (60.3)	21406 (76.6)	37740 (68.6)
1	10735 (39.7)	6538 (23.4)	17273 (31.4)
<b>Substance Use CAP</b>			
0	12709 (47.0)	17109 (61.2)	29818 (54.2)
1	1612 (6.0)	1097 (4.0)	2709 (4.91)

*Note: A description of each CAP can be found in Appendix A, Table 11*

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### 3.2 Descriptive Analysis of Control Interventions

Of the first-admission acute psychiatric inpatient population, 2667 (9.9%) men and 1897 women (6.8%) experienced the use of a CI, respectively. Both restraint and confinement rates had appeared to remain steady over time, hovering at about 10% for men and 7% for women ([Figure 1](#)). CI rates for men remained 3% higher on average than CI rates for women. Among patients who were at risk of harm to others, men also experienced proportionately higher CIs, however, between 2011 and 2014, rates of CI for men and women were relatively equal. For patients at a risk of harm to themselves, the overall proportion of CIs was lower, with more men experiencing CIs on average. At certain intervals, 2008-2009 and 2011-2012, CI rates among patients with an SOS>3 were similar ([Figure 2](#)). [Table 2](#) demonstrates that among the sample of men about 5% of the CIs applied were restraints and 11% were confinement interventions. In comparison, of the CIs applied to women, less than 4% were restraints and 8% were confinement interventions ([Table 2](#)).

**Table 2 Proportion of CI Use Among Adult Mental Health First-Admission Inpatients by Gender**

	Men (n=27069)	Women (n=27944)	All (n=55013)
<b>Any Control Intervention n (%)</b>	2667 (9.9)	1897 (6.8)	4564 (8.3)
<b>Any Restraint n (%)</b>	1367 (5.0)	1024 (3.7)	2391 (4.4)
<b>Any Confinement n (%)</b>	3063 (11.3)	2325 (8.3)	5388 (9.8)

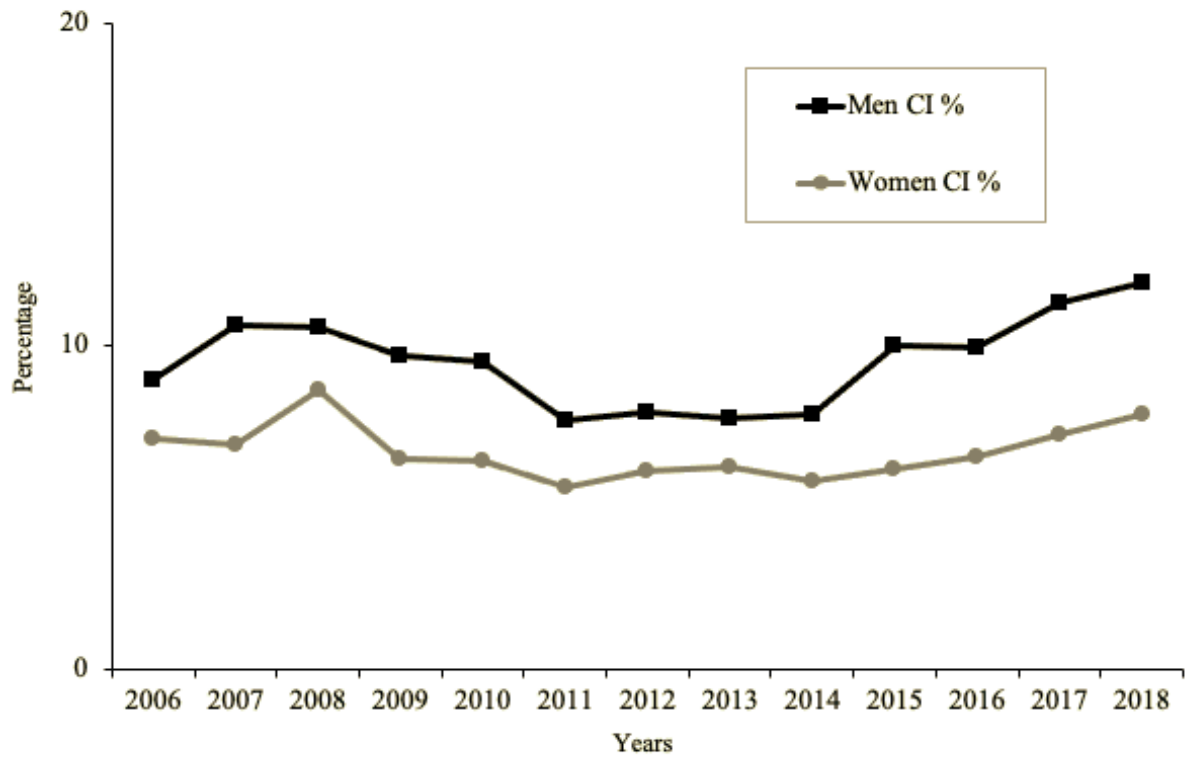
## GENDER DIFFERENCES IN RESTRAINT USE

When considering proportional CI use ([Table 4](#)), men experienced CIs more often than women for all demographic variables. Even in categories where there were more women, men were still restrained and/or confined in higher numbers. For example, while there were more women over the age 44, men were restraint/confined up to 8.8% more often in these age groups. When examining restraints and confinement separately, the highest prevalence was among men in the youngest (18-24) and oldest age groups (65+). For marital, living educational and employment status, the GD in CIs averaged around 3.6%. This difference was lower for restraints only (1.3%) and confinement only (2.7%). In general, the difference in CIs between men and women for all demographic variables was under 4%.

CIs were also experienced by more men across most diagnoses, with the exception of restraint use among those with anxiety disorders (0.7% more women) and any CI among those with schizophrenia-spectrum disorders (0.9% more women), however in the case of the later, the frequency of men being restrained was considerably higher (See [Table 5](#)). Patients exhibiting high risk of harm to others has also remained steady between 2006 and 2018, averaging around 60% for men. There were greater fluctuations in risk of harm among women, but the prevalence of women scoring an RHO>3 has declined, more recently averaging around 40% (See [Figure 4](#); [Figure 5](#)). From the data in [Table 6](#), restraint/confinement use was higher among men for all clinical symptom scales as well, despite women having higher scores on some scales, such as the DSI. When examining proportions of behaviours and CI use men experienced CIs more often than women, despite more women occupying Self-Harm and Trauma CAPs ([Table 6](#)) and scoring higher on the SOS scale.

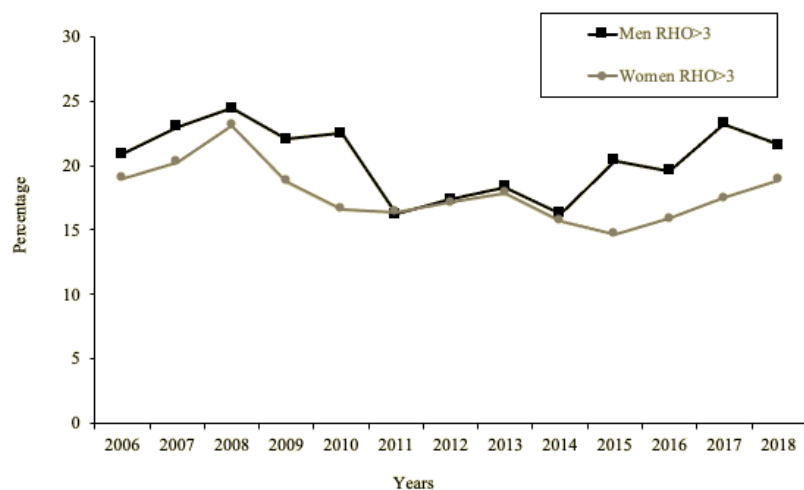
## GENDER DIFFERENCES IN RESTRAINT USE

**Figure 1 Use of CI among adults at First-Admission to Inpatient Psychiatry in Ontario, by Gender between 2006 – 2018**

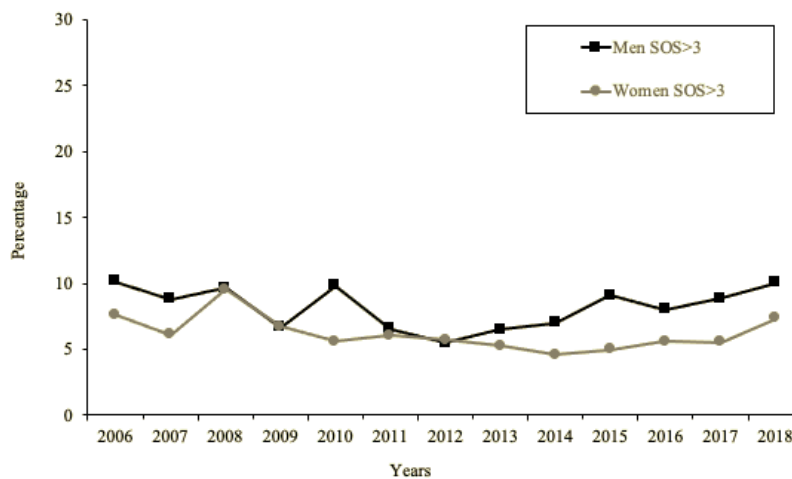


## GENDER DIFFERENCES IN RESTRAINT USE

**Figure 2 Use of CI among adults at First-Admission to Inpatient Psychiatry in Ontario with RHO >3, by Gender between 2006 – 2018**



**Figure 3 Use of CI among adults at First-Admission to Inpatient Psychiatry in Ontario with SOS >3, by Gender between 2006 – 2018**



**Table 3 Proportion of CI Use among patients with RHO >3/SOS >3 at First-Admission to Inpatient Psychiatry by Gender**

	Any Control Intervention		Any Restraint		Any Confinement	
	Men (n=2667)	Women (n=1897)	Men (n=1367)	Women (n=1024)	Men (n=3063)	Women (n=2325)
<b>RHO ≥ 3</b>	719 (4.1)	610 (3.0)	290 (1.7)	274 (1.3)	1077 (6.1)	994 (4.8)
<b>RHO &gt;3</b>	1948 (20.6)	1287 (17.8)	1077 (11.4)	750 (10.4)	1986 (21.0)	1331 (18.4)
<b>SOS ≥3</b>	1747 (10.9)	1112 (7.4)	871 (5.4)	584 (3.9)	1898 (11.9)	1290 (8.5)
<b>SOS &gt;3</b>	920 (8.3)	785 (6.1)	496 (4.5)	440 (3.4)	1165 (10.6)	1035 (8.1)

*Note: A description of RHO and SOS scales can be found in Appendix A, Table 10*

GENDER DIFFERENCES IN RESTRAINT USE

**Table 4 Proportion of CI Use Among Adult Mental Health First-Admission Inpatients by Gender and Demographic Characteristics**

Age	Any Control Intervention		Any Restraint		Any Confinement	
	Men (n=2667)	Women (n=1897)	Men (n=1367)	Women (n=1024)	Men (n=3063)	Women (n=2325)
18-24	655 (14.1)	292 (8.1)	353 (7.6)	141 (3.9)	737 (15.9)	367 (10.2)
25-34	680 (11.1)	357 (7.6)	325 (5.3)	204 (4.4)	816 (13.3)	430 (9.3)
35-44	434 (16.3)	340 (6.6)	209 (4.2)	189 (3.7)	472 (9.5)	405 (7.9)
45-54	406 (15.2)	400 (6.4)	195 (3.7)	181 (2.9)	494 (9.3)	534 (8.5)
55-64	249 (9.3)	255 (5.5)	127 (3.4)	137 (2.9)	316 (8.6)	343 (7.3)
65+	243 (9.1)	253 (7.1)	158 (6.7)	172 (4.8)	228 (9.7)	246 (6.9)
<b>Living Status n (%)</b>						
Homeless	162 (13.6)	87 (11.3)	90 (7.5)	46 (6.0)	178 (14.9)	91 (11.9)
Alone	866 (9.1)	594 (6.4)	405 (4.3)	311 (3.4)	987 (10.4)	741 (8.0)
With Others	1639 (10.0)	1216 (6.8)	827 (5.3)	667 (3.7)	1898 (11.6)	1493 (8.4)
<b>Marital Status n (%)</b>						
Never married	1946 (11.0)	959 (7.6)	978 (5.5)	520 (4.1)	2212 (12.5)	1167 (9.3)
Married or SO	433 (8.1)	524 (6.1)	241 (4.5)	274 (3.2)	492 (9.2)	653 (7.6)
Widowed or Separated	288 (7.2)	414 (6.1)	148 (3.7)	230 (3.4)	359 (9.0)	505 (7.5)
<b>Education n (%)</b>						
< High School	720 (10.6)	436 (7.6)	376 (5.6)	234 (4.1)	820 (12.1)	526 (9.2)
High School	756 (9.4)	503 (6.6)	380 (4.7)	277 (3.6)	922 (11.5)	646 (8.5)
> High School	1191 (9.7)	958 (6.6)	611 (5.0)	513 (3.5)	1321 (10.8)	1153 (7.9)
<b>Employment n (%)</b>						
Unemployed	1769 (10.4)	1220 (7.3)	919 (5.4)	644 (3.9)	2000 (11.7)	1485 (8.9)
Employed	379 (8.0)	270 (5.4)	178 (3.7)	139 (2.8)	465 (9.8)	346 (7.0)
Other	519 (9.9)	407 (6.5)	270 (5.1)	241 (3.8)	598 (11.4)	494 (7.9)

*Note: All variables were collapsed into the categories above*

GENDER DIFFERENCES IN RESTRAINT USE

**Table 5 Proportion of CI Use Among Adult Mental Health First-Admission Inpatients by Gender and Primary Diagnosis\***

	Any Control Intervention		Any Restraint		Any Confinement	
	Men (n=2667)	Women (n=1897)	Men (n=1367)	Women (n=1024)	Men (n=3063)	Women (n=2325)
Substance Use	220 (7.4)	122 (6.7)	118 (4.0)	55 (3.0)	256 (8.6)	154 (8.5)
Schizophrenia	1307 (8.1)	686 (8.8)	660 (6.0)	376 (4.8)	1511 (13.8)	810 (10.3)
Mood Disorders	751 (7.5)	780 (5.6)	357 (3.6)	390 (2.8)	899 (9.0)	1021 (7.3)
Anxiety Disorder	41 (5.1)	44 (4.0)	14 (1.7)	28 (2.6)	53 (6.6)	62 (5.7)
Personality Disorder	35 (8.3)	55 (4.8)	22 (5.2)	29 (2.5)	43 (10.2)	78 (6.8)
Neurocognitive Disorders	166 (23.1)	111 (16.1)	122 (17.0)	81 (11.8)	137 (19.1)	95 (13.8)
Neurodevelopmental Disorders	76 (21.1)	36 (17.8)	40 (11.1)	25 (12.4)	85 (23.6)	33 (16.3)
Other	57 (7.9)	54 (5.4)	25 (3.5)	34 (3.4)	67 (9.3)	65 (6.5)

*Note: \*Primary diagnoses applied at discharge*

GENDER DIFFERENCES IN RESTRAINT USE

**Table 6 Proportion of CI Use Among Adult Mental Health First-Admission Inpatients by Gender and RAI-MH Scales**

	Any Control Intervention		Any Restraint		Any Confinement	
	Men (n=2667)	Women (n=1897)	Men (n=1367)	Women (n=1024)	Men (n=3063)	Women (n=2325)
<b>Cognitive Performance Scale n (%)</b>						
0-2	2159 (8.6)	1453 (5.6)	1036 (4.1)	734 (2.8)	2529 (10.1)	1865 (7.2)
3-4	273 (22.3)	250 (18.0)	162 (13.3)	154 (11.1)	303 (24.8)	269 (19.4)
5-6	235 (34.5)	194 (30.6)	169 (24.8)	136 (21.5)	231 (33.9)	191 (30.1)
<b>Depression Severity Index n (%)</b>						
0-2	1395 (10.3)	780 (7.0)	740 (5.5)	438 (3.9)	1478 (10.9)	889 (8.0)
3-8	780 (7.0)	908 (7.4)	526 (5.0)	480 (3.9)	1341 (12.8)	1144 (9.4)
9-15	195 (6.5)	209 (4.5)	101 (3.3)	106 (2.3)	244 (8.1)	292 (6.3)
<b>Mania n (%)</b>						
0-2	692 (4.2)	474 (2.8)	325 (2.0)	234 (1.4)	973 (5.9)	769 (4.5)
3-5	515 (10.8)	331 (6.7)	273 (5.8)	183 (3.7)	581 (12.2)	410 (8.4)
6-20	1460 (24.7)	1092 (18.0)	769 (13.0)	607 (10.0)	1209 (25.5)	1146 (18.9)
<b>Positive Symptoms Scale n (%)</b>						
0-2	854 (5.6)	682 (3.9)	420 (2.8)	343 (2.0)	1058 (7.0)	939 (5.4)
3-6	1197 (13.9)	805 (10.3)	635 (7.4)	440 (5.6)	1308 (15.2)	958 (12.3)
7-12	616 (18.5)	410 (15.5)	312 (9.4)	241 (9.1)	697 (21.0)	428 (16.2)
<b>Risk of Harm to Others Scale n (%)</b>						
0-2	719 (4.0)	610 (3.0)	290 (1.7)	274 (1.3)	1077 (6.1)	994 (4.8)
3-4	618 (12.6)	536 (12.0)	299 (6.1)	288 (6.5)	699 (14.3)	592 (13.3)
5-6	1330 (29.1)	751 (26.8)	778 (17.0)	462 (16.5)	1287 (28.2)	739 (26.4)
<b>Severity of Self Harm Scale n (%)</b>						
0-2	1747 (10.9)	1112 (7.4)	871 (5.4)	584 (3.9)	1898 (11.9)	1290 (8.5)
3-4	476 (11.0)	410 (8.4)	274 (6.3)	252 (5.2)	587 (13.5)	464 (9.5)
5-6	444 (6.6)	375 (4.7)	222 (3.3)	188 (2.4)	578 (8.6)	571 (7.2)

*Note: A description of RHO and SOS scales can be found in Appendix A, Table 10*



GENDER DIFFERENCES IN RESTRAINT USE

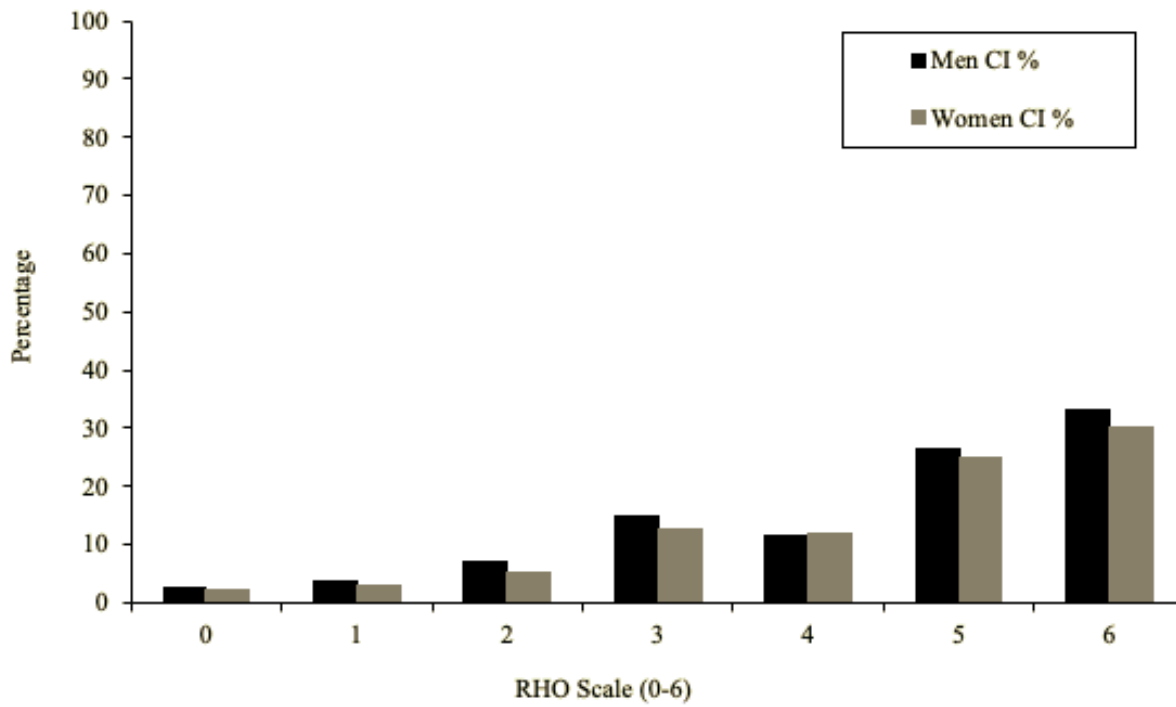
**Table 7 Proportion of CI Use Among Adult Mental Health First-Admission Inpatients by Gender and CAPs**

	Any Control Intervention		Any Restraint		Any Confinement	
	Men (n=2667)	Women (n=1897)	Men (n=1367)	Women (n=1024)	Men (n=3063)	Women (n=2325)
Traumatic Life Events CAP						
0	2439 (10.1)	1589 (7.0)	1250 (5.2)	845 (3.7)	2769 (11.4)	1879 (8.3)
1	114 (6.5)	132 (4.9)	58 (3.3)	79 (2.9)	160 (9.1)	221 (8.2)
2	114 (10.4)	176 (7.2)	59 (5.4)	100 (4.1)	134 (12.2)	225 (9.2)
Social Relationships CAP						
0	1019 (8.0)	660 (5.1)	507 (4.0)	348 (2.7)	1176 (9.2)	845 (6.6)
1	915 (12.5)	696 (9.1)	464 (6.4)	371 (4.9)	1038 (14.2)	817 (10.7)
2	733 (10.6)	541 (7.3)	396 (5.7)	305 (4.1)	849 (12.2)	663 (9.0)
Interpersonal Conflict CAP						
0	730 (4.4)	551 (3.1)	295 (1.8)	257 (1.5)	1093 (6.6)	885 (5.0)
1	1061 (15.0)	697 (10.1)	561 (8.0)	275 (5.4)	1131 (16.0)	781 (11.3)
2	876 (25.5)	649 (18.9)	511 (14.9)	392 (11.4)	839 (24.5)	659 (19.2)
Criminal Activity CAP						
0	1020 (6.2)	1090 (5.1)	514 (3.2)	592 (2.8)	1241 (7.6)	1398 (6.5)
1	1647 (15.4)	807 (12.3)	853 (8.0)	432 (6.6)	1822 (17.0)	927 (14.2)
Substance Use CAP						
0	1157 (9.1)	1127 (6.6)	600 (4.7)	632 (3.7)	1304 (10.3)	1324 (7.7)
1	137 (8.5)	72 (6.6)	62 (3.9)	39 (3.6)	169 (10.5)	86 (7.8)
2	1373 (10.8)	698 (7.2)	705 (5.5)	353 (3.6)	1590 (12.5)	915 (9.4)

*Note: A description of all CAPs can be found in Appendix A, Table 11*

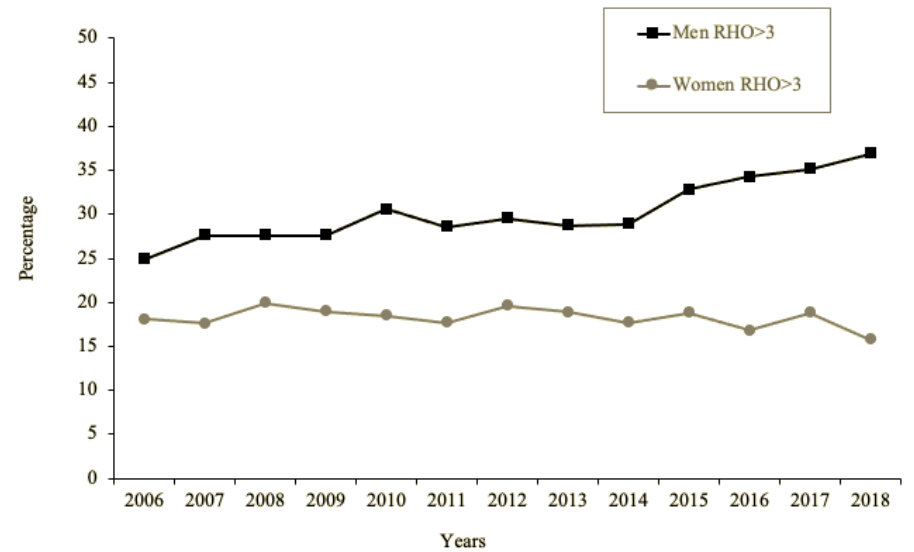
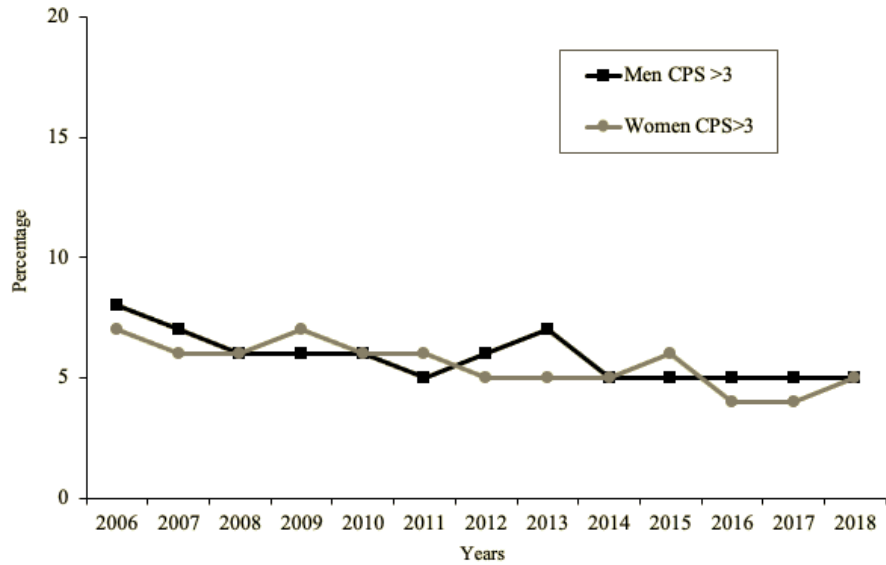
## GENDER DIFFERENCES IN RESTRAINT USE

**Figure 4 Use of CIs among adults at First-Admission to inpatient Psychiatry in Ontario, Full RHO, by Gender between 2006 – 2018**



# GENDER DIFFERENCES IN RESTRAINT USE

**Figure 5 A Comparison of CPS Scores >3 and RHO Scores >3 among adults at First-Admission to Inpatient Psychiatry in Ontario, by Gender between 2006 – 2018**



## GENDER DIFFERENCES IN RESTRAINT USE

### 3.3. Logistic Regression Analysis Findings

A gender-stratified multivariable logistic regression was performed to understand which variables are associated with experience of any control interventions (CI). Modelling results are summarized in [Tables 8 and 9](#). A summary of adjusted odd ratios can be found in [Figure 6](#).

#### 3.3.1. Control Interventions: Women

[Table 8](#) summarizes the results of the multivariable logistic regression among women, modelling for experiencing any CI. Among demographic characteristics: age, living status and marital status were statistically significant and associated with lower odds of experiencing restraint/confinement. The odds of experiencing a CI were slightly decreased by marital status and were more substantially influenced by age (lowered odds of 24%) and living status (lowered odds between 40-44%).

Most diagnoses were not significant, however among significant variables, having a primary diagnosis of either a neurocognitive or neurodevelopmental disorder more than doubled the odds of experiencing a CI among women.

When examining behavioural characteristics, posing a risk of harm to others, wandering and elopement were all significant associated with CIs. A moderate or severe score on the RHO scale, generated a 2.3- and 5.1-times greater odds of experiencing a CI among women, respectively. Subsequently, higher incidence of elopement and/or elopement attempts increased the odds of experiencing CIs by 1.9 times, at the lowest level of elopement, and 2.7 times at the highest level. In general, the odds of CI intensified as the frequency and/or severity of the behaviours increased. However, the greatest odds of experiencing CI were with a moderate level rather than the highest level of elopement. Wandering also doubled the odds of experiencing CIs

## GENDER DIFFERENCES IN RESTRAINT USE

regardless if wandering behaviours were exhibited daily or less frequently. However, the lowest level of wandering was not significantly associated with CIs.

The only clinical symptom associated with the experience of CIs for women was hallucinations, which was associated with 1.3 greater odds of CI. With regard to substance use, only recent use of stimulants was significantly associated, with an odds ratio of 1.5. Higher scores on the mania scale were associated with incrementally higher odds of experiencing a CI. A mania scale score between 6-20 tripled the odds of being restrained and/or confined.

Among women, triggering the Interpersonal Conflict CAP was significantly associated with CIs. The odds of experiencing a CI were 2 times greater when at high risk for interpersonal conflict. This model for CI among women was assessed as a very good fit based on the c-statistic equal to 0.82. The model was evaluated using full uncategorized RAI-MH scales as well and there was only a 0.01 increase to the final c-statistic (0.83), as such collapsed scales were maintained in the model.

## GENDER DIFFERENCES IN RESTRAINT USE

**Table 8 Multivariable Logistic Regression Model: Analysis of CI Use among Women in Inpatient Psychiatry, Ontario 2006-2018 (n=27944)**

	Block 1 (C-stat = 0.553)		Block 2 (C-stat = 0.606)		Block 3 (C-stat = 0.811)		Block 4 (C-stat = 0.824)		Final Model (C-stat = 0.822)	
	Odds Ratio (95% CI*)	p-value	Odds Ratio (95% CI*)	p-value	Odds Ratio (95% CI*)	p-value	Odds Ratio (95% CI*)	p-value	Odds Ratio (95% CI*)	p-value
<b>DEMOGRAPHIC CHARACTERISTICS</b>										
<b>Age</b>										
18-24 (REF)	1.00		1.00		1.00		1.00		1.00	
25-34	0.99 (0.84-1.17)	0.93	0.89 (0.76-1.06)	0.19	0.92 (0.77-1.10)	0.37	0.92 (0.77-1.10)	0.37	0.92 (0.77-1.10)	0.37
35-44	0.89 (0.75-1.05)	0.17	0.78 (0.75-1.05)	0.005	0.78 (0.65-0.94)	0.0098	0.80 (0.67-0.96)	0.017	0.80 (0.67-0.96)	0.012
45-54	0.88 (0.74-1.05)	0.16	0.75 (0.63-1.90)	0.0016	0.77 (0.64-0.91)	0.0046	0.79 (0.66-0.95)	0.011	0.79 (0.66-0.95)	0.0068
55-64	0.76 (0.63-0.92)	0.0006	0.62 (0.51-0.76)	<.0001	0.64 (0.53-0.78)	<.0001	0.67 (0.54-0.87)	<.0001	0.67 (0.54-0.87)	<.0001
65+	1.04 (0.85-1.27)	0.72	0.73 (0.59-0.90)	0.0029	0.69 (0.56-0.84)	0.0007	0.70 (0.56-0.87)	0.0012	0.70 (0.56-0.87)	0.0007
<b>Living Status</b>										
Homeless (REF)	1.00		1.00		1.00		1.00		1.00	
Alone	0.56 (0.44-0.71)	<.0001	0.60 (0.47-0.76)	<.0001	0.77 (0.59-1.01)	0.051				
With Others	0.60 (0.48-0.76)	<.0001	0.63 (0.50-0.80)	0.0001	0.79 (0.61-1.02)	0.068				
<b>Marital Status</b>										
Never married (REF)	1.00		1.00							
Married / Partnered	0.81 (0.72-0.92)	0.0014	0.92 (0.81-1.05)	0.20						
Widowed or Separated	0.85 (0.74-0.97)	0.0155	0.90 (0.79-1.04)	0.15						
<b>DIAGNOSES</b>										
<b>Primary Diagnosis</b>										
Substance Use			0.80 (0.43-1.49)	0.48						
Schizophrenia			1.14 (0.63-2.07)	0.67						
Mood Disorder			0.71 (0.39-1.29)	0.25						
Anxiety Disorder			0.48 (0.25-0.94)	0.032	0.87 (0.63-1.21)	0.406				
Personality Disorder			0.53 (0.28-1.02)	0.056						
Neurocognitive Disorder			2.59 (1.39-4.83)	0.0028	1.98 (1.53-2.56)	<.0001	1.94 (1.70-2.58)	<.0001	1.94 (1.70-2.58)	<.0001
Neurodevelopmental Disorder			2.35 (1.17-4.72)	0.015	1.75 (1.16-2.65)	0.0079	1.80 (1.16-2.65)	0.0026	1.80 (1.16-2.65)	0.0059
Other Disorder			0.64 (0.34-1.24)	0.19						
<b>BEHAVIOURAL CHARACTERISTICS</b>										
<b>RAI-MH Scales</b>										
<b>Risk of Harm to Others Scale</b>										
0-2 (REF)					1.00		1.00		1.00	
3-4					2.28 (2.00-2.63)	<.0001	1.94 (1.69-2.24)	<.0001	2.30 (2.00-2.63)	<.0001
5-6					5.08 (4.44-5.80)	<.0001	3.91 (3.37-4.52)	<.0001	5.12 (4.47-5.84)	<.0001
<b>Severity of Self-Harm Scale</b>										
0-2 (REF)					1.00		1.00		1.00	
3-4					1.05 (0.92-1.19)	0.49	1.05 (0.92-1.19)	0.46		
5-6					0.87 (0.76-0.99)	0.031	0.90 (0.76-0.99)	0.13		
<b>Mania Scale</b>										
0-2 (REF)					1.00		1.00		1.00	
3-5					1.68 (1.44-1.95)	<.0001	1.46 (1.22-1.68)	<.0001	1.68 (1.44-1.95)	<.0001
6-18					3.01 (2.64-3.43)	<.0001	2.29 (1.98-2.65)	<.0001	2.07 (2.64-3.43)	<.0001

## GENDER DIFFERENCES IN RESTRAINT USE

### Individual Behaviours

Elopement						
0 (REF)	1.00		1.00		1.00	
1	1.90 (1.43-2.50)	<.0001	1.77 (1.34-2.34)	<.0001	1.90 (1.44-2.50)	<.0001
2	2.71 (2.30-3.20)	<.0001	2.43 (2.06-2.87)	<.0001	2.71 (2.30-3.20)	<.0001
3	2.60 (2.04-3.31)	<.0001	2.44 (1.91-3.11)	<.0001	2.60 (2.04-3.31)	<.0001
Wandering						
0 (REF)	1.00		1.00		1.00	
1	1.32 (1.96-1.81)	0.089	1.32 (1.96-1.81)	0.0149	1.32 (1.96-1.81)	0.15
2	1.92 (1.62-2.27)	<.0001	1.92 (1.62-2.27)	<.0001	1.92 (1.62-2.27)	<.0001
3	2.06 (1.71-2.47)	<.0001	2.06 (1.71-2.47)	<.0001	2.06 (1.71-2.47)	<.0001

### CLINICAL CHARACTERISTICS

#### Individual Symptoms

Involuntary Admission			1.01 (0.89-1.16)	0.85		
Hallucinations			1.34 (1.17-1.53)	<.0001	1.33 (1.18-1.49)	<.0001
Command Hallucinations			0.86 (0.70-1.05)	0.13		
Delusions			0.99 (0.87-1.13)	0.93		
Abnormal Thoughts			1.12 (0.98-1.27)	0.099		
<b>Substance Use</b>						
Recent Inhalant Use			0.97 (0.48-1.93)	0.93		
Recent Hallucinogens			1.15 (0.73-1.82)	0.55		
Recent Cocaine			1.04 (0.81-1.35)	0.69		
Recent Stimulants			1.48 (1.11-1.96)	0.0076	1.37 (1.07-1.76)	0.012
Recent Opiates			0.77 (0.58-1.03)	0.074		
Recent Cannabis			0.99 (0.84-1.19)	0.83		
Problematic Alcohol Use			0.99 (0.81-1.22)	0.99		
Smoking			0.94 (0.84-1.06)	0.33		
Misuse of Medications			1.04 (0.86-1.26)	0.68		
Withdrawal			0.96 (0.78-1.19)	0.80		

#### Clinical Assessment Protocols

##### (CAPs)

Traumatic Life Events CAP						
0 (REF)			1.00		1.00	
1			0.78 (0.64-0.95)	0.013	0.76 (0.62-0.92)	0.0058
2			0.80 (0.67-0.96)	0.018	0.80 (0.66-0.95)	0.012
Social Relationships CAP						
0 (REF)			1.00			
1			1.09 (0.96-1.24)	0.18		
2			0.93 (0.81-1.07)	0.27		
Interpersonal Conflict CAP						
0 (REF)			1.00		1.00	
1			1.53 (1.34-1.75)	<.0001	1.54 (1.34-1.75)	<.0001
2			2.04 (1.74-2.38)	<.0001	2.07 (1.74-2.38)	<.0001
Criminal Activity CAP						
0(REF)			1.00			
1			1.12 (0.96-1.24)	0.062		
Substance Use CAP						
0 (REF)			1.00			
1			0.99 (0.76-1.31)	0.98		
2			0.99 (0.81-1.21)	0.93		

Note: *Highlighted* = removed from model \*CI = Confidence interval in this table

## GENDER DIFFERENCES IN RESTRAINT USE

### 3.3.2. Control Interventions: Men

[Table 9](#) summarizes the results of the multivariable logistic regression among men, modelling for any CI. All age groups, any non-homeless living status and marital status were significantly associated with lower odds of experiencing CIs among men. The odds of experiencing a CI were decreased between 38-50% for in the middle age groups and more modestly for those in the youngest age group (33% reduction in odds) and the lowest for those in the oldest age group (only a 26% reduction). Both living alone, or living with others, was associated with decreased odds of CI by 30%.

Most diagnoses were not significant, however among significant variables, having a primary diagnosis of substance use disorder, or anxiety disorder, was associated with decreased odds of experiencing CI by 49% and 66%, respectively. A mood disorder diagnosis also reduced the odds of being restrained/confined by 66%. While having a neurocognitive disorder was associated with 2.4 times greater odds of experiencing a CI. There were more clinical symptoms associated with CIs for men than for women. Involuntary admission and presence of abnormal thoughts increased the odds of CIs by 13% and 28%, respectively. With regard to substance use, both the recent use of stimulants and smoking were significantly associated with CIs, with stimulant generating 1.4 times greater odds of having a CI administered. Smoking, on the other hand, was associated with 13% decreased odds of restraint/confinement. Higher scores on the Mania scale were associated with incrementally higher odds of experiencing a CI. A Mania scale score between 6-18 tripled the odds of being restrained and/or confined.

When examining behavioural characteristics, the risk of harm to others, wandering and elopement were all significant associated with CIs. With a moderate or severe score on the RHO scale, there was a 1.5- and 3.2- times greater odds of experiencing a CI, respectively.



## GENDER DIFFERENCES IN RESTRAINT USE

Subsequently, elopement and/or elopement attempts significantly increased the odds of experiencing CIs by 2.4 times, at the lowest level of elopement and 1.5 times. In general, the odds of CI intensified as the frequency and/or severity of the behaviours increased. Wandering also increased the odds of experiencing CIs by at least 1.5 times. However, the lowest level of wandering was not significantly associated with CIs.

Among men, triggering any CAP, with the exception of substance use, was associated with CIs. Triggering the Trauma and Social Relationships CAPs was shown to be protective against experiencing a CI. Having history of trauma or having ongoing safety needs related to a trauma was associated with 18% lowered odds of CIs and having serious social relationship issues like isolation of family dysfunction reduced the odds of CIs by 16%. However, only moderate trauma levels and safety needs and severe isolation/family dysfunction were significant. In contrast, interpersonal conflict and previous criminal involvement were associated with odds ratios of 2.3 and 1.3, respectively. This model for CI among men was assessed as a very good fit based on the c-statistic equal to 0.82. The model was also evaluated using full uncategorized RAI-MH scales and there was no change to the final c-statistic.

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**Table 9 Multivariable Logistic Regression Model: Analysis of CI Use among Men in Inpatient Psychiatry, Ontario 2006-2018 (n=27069)**

	Block 1 (C-stat = 0.584)		Block 2 (C-stat = 0.627)		Block 3 (C-stat = 0.811)		Block 4 (C-stat = 0.817)		Final Model (C-stat = 0.817)	
	Odds Ratio (95% CI*)	p-value	Odds Ratio (95% CI*)	p-value	Odds Ratio (95% CI*)	p-value	Odds Ratio (95% CI*)	p-value	Odds Ratio (95% CI*)	p-value
<b>DEMOGRAPHIC CHARACTERISTICS</b>										
<b>Age</b>										
18-24 (REF)	1.00		1.00		1.00		1.00		1.00	
25-34	0.77 (0.69-0.87)	<.0001	0.76 (0.67-0.85)	<.0001	0.91 (0.76-1.10)	0.32	0.84 (0.74-0.95)	0.0072	0.84 (0.74-0.95)	0.0072
35-44	0.62 (0.54-0.71)	<.0001	0.61 (0.54-0.70)	<.0001	0.78 (0.64-0.94)	0.0089	0.76 (0.64-0.87)	0.0002	0.76 (0.64-0.87)	0.0002
45-54	0.56 (0.48-0.64)	<.0001	0.54 (0.47-0.62)	<.0001	0.77 (0.64-0.93)	0.0059	0.73 (0.63-0.85)	<.0001	0.73 (0.63-0.85)	<.0001
55-64	0.50 (0.42-0.59)	<.0001	0.46 (0.39-0.55)	<.0001	0.65 (0.52-0.80)	<.0001	0.60 (0.50-0.71)	<.0001	0.60 (0.50-0.71)	<.0001
65+	0.84 (0.70-0.99)	0.049	0.58 (0.47-0.70)	<.0001	0.69 (0.55-0.87)	0.0016	0.70 (0.57-0.86)	0.0005	0.70 (0.57-0.86)	0.0005
<b>Living Status</b>										
Homeless (REF)	1.00		1.00		1.00		1.00		1.00	
Alone	0.70 (0.58-0.83)	<.0001	0.94 (0.83-1.07)	0.34	1.02 (0.88-1.17)	0.34				
With Others	0.70 (0.59-0.83)	<.0001	0.85 (0.73-0.98)	0.025	1.00 (0.87-1.16)	0.025				
<b>Marital Status</b>										
Never married (REF)	1.00		1.00		1.00		1.00		1.00	
Married / Partnered	0.83 (0.73-0.94)	0.0031	0.72 (0.60-0.98)	0.0004	0.78 (0.60-1.01)	0.062				
Widowed or Separated	0.76 (0.67-0.88)	0.0001	0.68 (0.57-0.86)	<.0001	0.80 (0.57-1.03)	0.086				
<b>DIAGNOSES</b>										
<b>Primary Diagnosis</b>										
Substance Use			0.51 (0.29-0.89)	0.018	1.11 (0.89-1.38)	0.36				
Schizophrenia			0.82 (0.47-1.42)	0.47						
Mood Disorder			0.56 (0.32-0.97)	0.037	0.96 (0.88-1.10)	0.79				
Anxiety Disorder			0.34 (0.18-0.65)	0.0009	0.86 (0.62-1.20)	0.39				
Personality Disorder			0.54 (0.28-1.03)	0.062						
Neurocognitive Disorder			2.43 (1.36-4.34)	0.0026	1.95 (1.50-2.54)	<.0001	2.13 (1.70-2.69)	<.0001	2.14 (1.70-2.70)	<.0001
Neurodevelopmental Disorder			1.49 (0.81-2.73)	0.20						
Other Disorder			0.57 (0.31-1.05)	0.73						
<b>RAI-MH Scales</b>										
<b>Risk of Harm to Others Scale</b>										
0-2 (REF)					1.00		1.00		1.00	
3-4					2.29 (1.99-2.62)	<.0001	1.15 (1.33-1.72)	<.0001	1.52 (1.34-1.73)	<.0001
5-6					5.13 (4.48-5.87)	<.0001	3.13 (2.77-3.53)	<.0001	3.16 (2.79-3.57)	<.0001
<b>Severity of Self-Harm Scale</b>										
0-2 (REF)					1.00					
3-4					1.05 (0.92-1.19)	0.028				
5-6					0.86 (0.76-0.98)	0.500				
<b>Mania Scale</b>										
0-2 (REF)										
3-5					1.00		1.00		1.00	
6-18					1.87 (1.42-2.47)	<.0001	1.48 (1.30-1.69)	<.0001	1.49 (1.31-1.69)	<.0001
					2.71 (2.30-3.19)	<.0001	2.35 (2.08-2.65)	<.0001	2.36 (2.09-2.66)	<.0001

## GENDER DIFFERENCES IN RESTRAINT USE

### Individual Behaviours

Elopement						
0 (REF)	1.00		1.00		1.00	
1	1.31 (0.96-1.80)	0.091	1.55 (1.20-1.99)	0.0007	1.54 (1.20-1.99)	0.0007
2	1.92 (1.63-2.28)	<.0001	2.40 (2.07-2.78)	<.0001	2.41 (2.08-2.79)	<.0001
3	2.07 (1.72-2.49)	<.0001	2.41 (1.92-3.04)	<.0001	2.42 (1.92-3.04)	<.0001
Wandering						
0 (REF)	1.00		1.00		1.00	
1	1.31 (0.96-1.80)	0.091	1.19 (0.90-1.58)	0.2213	1.20 (0.91-1.59)	0.2213
2	1.92 (1.63-2.28)	<.0001	1.66 (1.43-1.76)	<.0001	1.67 (1.43-1.77)	<.0001
3	2.07 (1.72-2.49)	<.0001	1.48(1.24-1.76)	<.0001	1.49 (1.25-1.77)	<.0001

### Individual Symptoms

Involuntary Admission			1.13 (1.01-1.26)	0.037	1.13 (1.01-1.26)	0.037
Hallucinations			1.05 (0.93-1.17)	0.44		
Command Hallucinations			1.12 (0.96-1.32)	0.16		
Delusions			1.01 (0.89-1.12)	0.89		
Abnormal Thoughts			1.29 (1.16-1.44)	<.0001	1.32 (1.19-1.46)	<.0001
<b>Substance Use</b>						
Recent Inhalant Use			0.71 (0.46-1.14)	0.15		
Recent Hallucinogens			1.19 (0.89-1.62)	0.27		
Recent Cocaine			1.06 (0.88-1.26)	0.53		
Recent Stimulants			1.30 (1.13-1.70)	0.0012	1.39 (1.16-1.46)	0.0012
Recent Opiates			0.86 (0.68-1.07)	0.19		
Recent Cannabis			1.08 (0.92-1.21)	0.30		
Problematic Alcohol Use			1.06 (0.92-1.24)	0.44		
Smoking			0.87 (0.79-0.96)	0.0056	0.87 (0.79-0.95)	0.0056
Misuse of Medications			0.99 (0.85-1.16)	0.78		
Withdrawal			0.96 (0.82-1.13)	0.62		

### Clinical Assessment Protocols

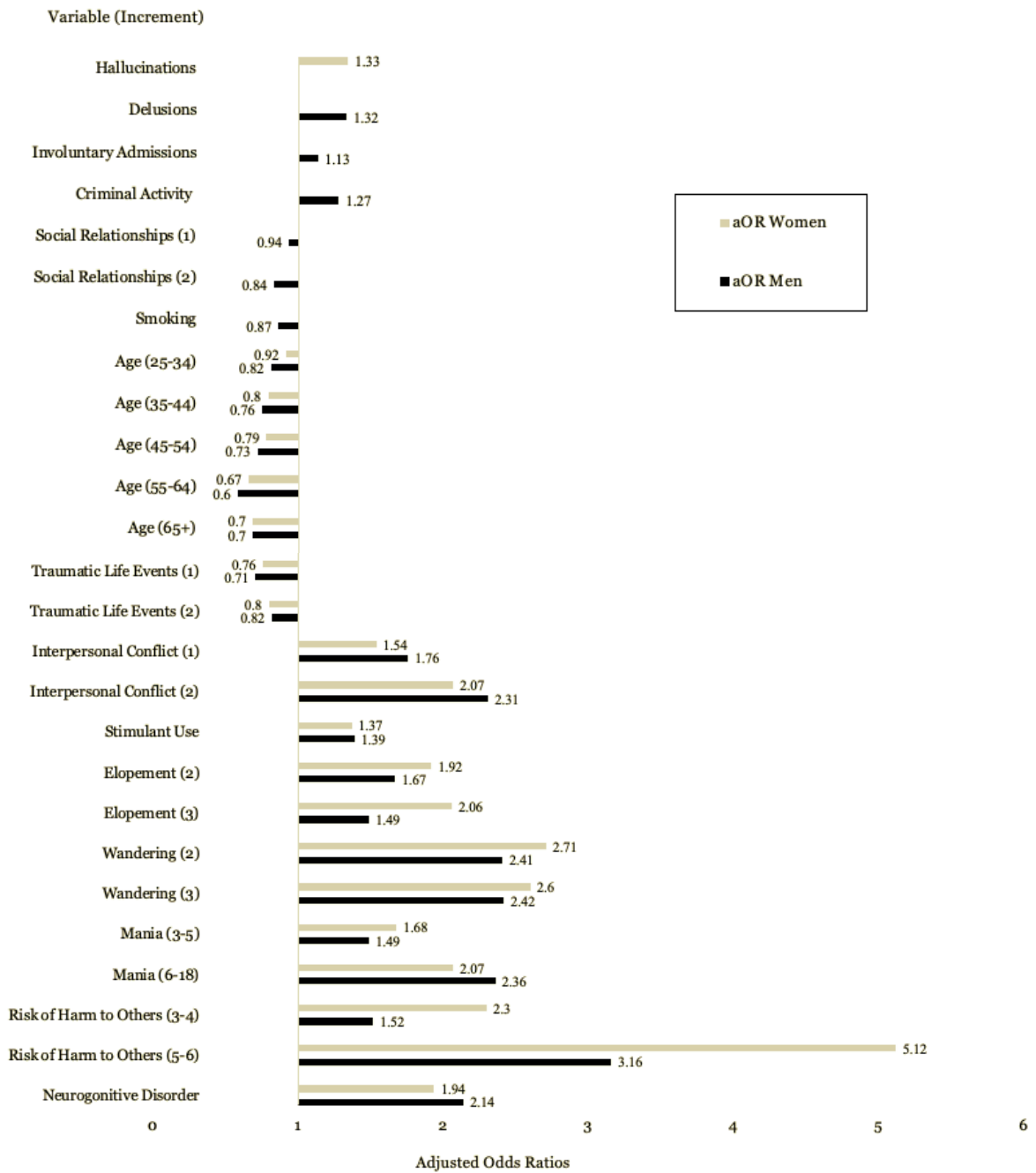
#### (CAPs)

Traumatic Life Events CAP						
0 (REF)			1.00		1.00	
1			0.72 (1.58-0.88)	0.0018	0.71 (0.58-0.88)	0.0013
2			0.83 (0.66-1.03)	0.90	0.82 (0.66-1.03)	0.083
Social Relationships CAP						
0 (REF)			1.00		1.00	
1			0.95 (0.84-1.05)	0.30	0.94 (0.84-1.05)	0.30
2			0.84 (0.76-0.94)	0.0023	0.84 (0.76-0.94)	0.0023
Interpersonal Conflict CAP						
0 (REF)			1.00		1.00	
1			1.76 (1.57-1.97)	<.0001	1.76 (1.57-1.97)	<.0001
2			2.31 (2.02-2.65)	<.0001	2.31 (2.02-2.65)	<.0001
Criminal Activity CAP						
0(REF)			1.00		1.00	
1			1.27 (1.14-1.40)	<.0001	1.27 (1.14-1.40)	<.0001
Substance Use CAP						
0 (REF)			1.00			
1			0.92 (0.75-1.13)	0.43		
2			0.92 (0.79-1.08)	0.31		

Note: *Highlighted* = removed from model \*CI = Confidence interval in this table

## GENDER DIFFERENCES IN RESTRAINT USE

**Figure 6 Adjusted Odds Ratios for Clinical Characteristics Significantly Associated with the Odds of Control Interventions by Gender**



### 4.0 Discussion

The objective of this study was to understand gender differences (GDs) in control interventions (CIs) at first admission to acute inpatient psychiatric settings across Ontario. The analysis of the OHMRS data found that: (1) the use of CIs has remained steady overtime with more men experiencing CIs than women, (2) while there are similarities in the demographic, behavioral and clinical variables associated with CI use, some notable GDs were identified in analysis. This section will cover these findings as well as discuss implications for practice and future research as well as the limitations of this study.

#### 4.1 Gender Differences in Control Interventions Over Time

Both restraint and confinement rates remained steady over time, hovering around 10%, with CI rates 3% higher among men, compared to women. This GD is relatively small and is best explained by higher rates of violence, aggression and disruptive behaviour among men. The prevalence of high risk of harm to others over time, displays a widening gender gap, with men exhibiting increasing rates of high risk of harm to others (See [Figure 5](#)). When examining prevalence of CI for those with a violence and aggression, the GD decreases, suggesting that those posing high safety risks are at greater odds of restraint. An alternative explanation is that men may experience conditions of altered cognition more often than women. For example, 12% more men were diagnosed with schizophrenia and 2.1% more men are stimulate users, both of which were significantly associated CI use. Cognitive impairment, as determined by in-hospital assessments, is associated with CIs (Yevchak et al., 2015) and higher rates of impaired cognition could explain higher rates of CIs among men. Applied behaviour management strategies may be difficult to implement with cognitively impaired patients as effective communication may be a

## GENDER DIFFERENCES IN RESTRAINT USE

challenge between patient and provider (Emmanuel et al., 2013; Li et al., 2015). Instead, consultation with specialists in neurocognitive disorders may be important for contexts such as acute psychiatry. However, rates of neurocognitive disorders were similar between men and women and prevalence of elevated CPS scores actually decreased over time for genders ([Figure 5](#)). Thus, violent and aggressive behaviours better explain the gendered CI discrepancy over time rather than cognition.

Among patients at risk of harm to themselves, more men experienced CIs than women. However, the overall proportion of CIs was lower for this group compared to those at risk of harm to others. Lower proportions CIs among this group is positive, as use of CIs to manage self-harm behaviours may exacerbate trauma and negative emotions as well as impair the therapeutic relationship between the staff and their patients (Emmanuel et al., 2013). Likewise, the odds of CI were lower for men and women with a history of trauma compared to those without trauma. The traumatic life events CAP, considers a wide range of events that may be traumatic for patients, ranging from living in areas of conflict to witnessing an accident. This finding is encouraging and consistent with the “trauma-informed care” approach to restraints, which suggest that those with traumatic pasts may suffer more adverse effects with the application of a restraint, and thus staff should find safety alternatives (Emmanuel et al., 2013).

On a similar note, this analysis revealed that confinement was used more often than restraints for both genders. Confinement is sometimes used as an alternative to restraint for patients exhibiting frequent aggressive behaviours, as applying restraints may increase risk of injury to staff and patients. However, isolation may also increase risk of suicidal ideation, self-harm behaviours and depressive symptoms (Emmanuel et al., 2013; Li et al., 2015). Therefore, patients at high risk of self-harm behaviours benefit from alternatives to CIs altogether.

## GENDER DIFFERENCES IN RESTRAINT USE

Overall, the rate of restraints over time has remained steady for both genders with slightly more men experiencing CIs. Considering that rates of cognitive impairment have declined, the difference between CI use between the genders is better explained by violent/aggressive behaviours have remained consistently higher (20%) among men over time. Lastly, at-risk populations such as those at risk of self-harm and those with a history of trauma are restrained/confined in lower proportions.

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### 4.2 Gender Differences in the Proportion of Control Intervention

The overall proportion of patients who experienced CIs for both genders remained under 12% of the total population of adult psychiatric inpatients at first admission in acute psychiatry units. The percentage of men experiencing use of CIs was higher than women, even when holding violent/aggressive behaviours constant. When considering demographic characteristics, the effect of age is likely a confounding factor for certain behaviours and diagnoses. For example, older age increases the likelihood of a patient having neurocognitive disorders, such as dementia (Derreberry & Holroyd, 2019), thus, having a higher proportion patients restrained in older age groups would be plausible due to a higher frequency cognitive impairment. As previously mentioned, age and also be considered through its association with diagnoses and behaviour. In comparison to older age groups, younger age is associated with schizophrenia-spectrum disorders or stimulant use (Immonen, Jääskeläinen, Korpela, & Miettunen, 2017; Sara et al., 2012) and may have contributed to slightly elevated CI use among this age group. Since age was found to be protective against the odds of experiencing CI, behavioural and diagnostic variables better explain differences in CI use across the lifespan.

Clinical symptoms associated with specific diagnoses may also produce behaviours associated with CIs. For example, disorganized and excited-type psychiatric symptoms are predictive of aggression (Podubinski, Lee, Hollander, & Daffern, 2017), which may explain in part why higher proportions of patients with schizophrenia-spectrum disorders experience CIs, even among women, who generally experience CIs less often. CIs are applied in higher proportions to men for most diagnoses, with some exceptions. However, the only diagnoses significantly associated with the odds of CIs were neurocognitive and neurodevelopmental disorders. Therefore, according to this analysis, behaviours and individual clinical symptoms



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were more strongly associated with the odds of restraint and/or confinement.

The only substance associated with CIs for both men and women was stimulant use, which includes amphetamines or methamphetamines. This relationship may be attributable to the psychiatric complaints, common to stimulant users, such as delusions, paranoia, hallucinations, and suicidal ideation (Center for Substance Abuse Treatment, 1999). Similarly, one GD is that hallucinations were significant among women, while for men, abnormal thoughts were significant for CI use. This difference may be attributable to men exhibiting more delusional thought processes both at onset and longitudinally (Yevchak et al., 2015). Interestingly, command hallucinations were not associated with CIs for either gender. These hallucinations may involve thoughts commanding the person to harm others, so it comes as a surprise that they do not seem to be associated with CIs. This non-significant finding could be explained by the fact that command hallucinations are rare and may occur often enough to influence CI use.

Behaviours and clinical characteristics were the most strongly associated with the odds of CI and exhibited interesting GDs. For example, the Criminal Activity CAP was associated with greater odds of CI for men but was not significant for women. When this CAP is triggered it identifies those with both violent and non-violent actions requiring police intervention in the past year. It is interesting that this CAP has no effect on the odds for women, possibly because women were less likely to have prior criminal involvement. Among variables significant in both gender models, the magnitude of the effect varied between genders. The most interesting gender effect is likely in the risk of harm to others scale. While women were at lower odds of experiencing CI for many variables, at the highest levels of the RHO, women were at 5 times greater odds of experiencing CI, compared to men who were only at 3 times greater odds at the same level (See [Figure 6](#)). This is consistent with findings of CI use among the forensic

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population, which also found that women at the highest levels of aggression were more likely to experience CIs (Mathias, 2014). It is possible that when women exhibit this level of violence and aggression, staff may feel that they are unable to manage without restraints, as these behaviours are uncommon and unexpected among women. It is also likely that women with lower scores on the RHO were less likely to experience a CI compared to men with lower scores on the RHO. Therefore, the odds of CI increase more at higher levels of risk for women than men. Staff reactions to risk of harm may also vary by gender as staff take into consideration the acute threat, past experiences working with aggressive patients and the information they have the patient (Riahi, Thomson, & Duxbury, 2020). While there seems to be a gender effect based on this finding, the decision to use CIs requires immediate response making it difficult to consider alternative options. However, while the decision to use CIs is deemed as a “last resort” there is little research on understanding what constitutes a “last resort” (Riahi et al., 2020). While men may be perceived as threats more often by staff, due to their attributes and/or behaviours, staff perceptions also play a significant role in the decision to use or prevent CIs. Similarly, the odds of CI for men with interpersonal conflict, compared to those without, was 30% more compared to the odds for women exhibiting conflict, compared to women without. At this level of interpersonal conflict, a patient is experiencing conflict with everyone around them, not only friends and family. This pattern is also exhibited for manic symptoms, despite men and women having proportionally equal levels of mania in this acute psychiatric population. One explanation could be that the combination of behaviours exhibited may be, collectively, perceived as a greater threat. For example, creating conflict through verbal and physical abuse may be viewed as a greater threat than resisting care and being socially disruptive.

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While men appeared to experience more CIs, there was evidence of best practices in CI use for at-risk populations. When examining CAPs, the odds ratio for men with trauma appropriately decreased the odds of experiencing a CI. This finding is encouraging and consistent with the a “trauma informed care” approach to restraints, which suggest that those with traumatic pasts may suffer more adverse effects with the application of a restraints/confinement, and thus staff should find safety alternatives (Emmanuel et al., 2013). Smoking and dysfunctional social relationships were also among protective factors against the use of CIs for men. However, these variables are likely confounding for other behavioural and clinical variables. For example, smokers are likely more stable, if they are able to leave the unit to smoke and are thus, not exhibiting behaviours that merit CIs. Similarly, patients with the social dysfunction (Social Relationships CAP) are experiencing a crumbling support system and may be exhibiting social withdrawal, as family and friends may feel overwhelmed by their condition. These conditions typically not associated with CIs, as these patients are more subdued.

In summary, behavioural and clinical variables were more strongly associated with the odds of experiencing CIs than diagnoses or demographic variables for both men and women. Trauma and self-harm behaviours were protective against CI use for both genders. Some interesting findings were that men were at a greater odd of experiencing CI for most variables, even at similar levels of conflict with others or mania symptoms, with the exception of hallucinations and the highest level of violence and aggression. Overall, violent/aggressive behaviours contribute to the highest odds of experiencing CIs for both genders.

### **5.0 Implications**

#### **5.1 Clinical Practice**

Behaviours and clinical symptoms, as assessed by the CAPs and scales, were the most strongly associated with CIs. This study demonstrates that these clinical tools are effective in identifying patients at a greater of odds of CIs and thus, have the potential to be used in care planning. While the RAI-MH assessment is mandated, it is not compulsory to apply the findings of some assessment tools in treatment of inpatients. For example, the CAPs are not mandated in clinical care, but provide useful information about the patients support status, relationships, behavioural challenges and symptoms. Using these tools to identify at-risk patients could support early stabilization and planning to prevent use of CIs (Emmanuel et al., 2013). Providing staff with adequate training in to incorporate these tools into behaviour management will support least-restraint approaches, continue to reduce CI use and improve patient outcomes. In particular, men may benefit from early behavior management strategies as indicated by indicators such as involuntary admission and interpersonal conflict measures; establishing rapport with staff, for example, may reduce the risk of restraint during the hospital stay. Research shows that if staff understand the adverse effects of CIs this translates into more empathetic treatment (Khalil, Al Ghamdi, & Al Malki, 2017). Proper training should include detailed documentation of each incidence of CIs, as a recent study reported that 36% of CIs were not recorded (Thomann, Zwakhalen, Richter, Bauer, & Hahn, 2020). Another approach is immediate staff debriefing, following the application of CIs. This process allows staff to reflect on the recent experience with an interdisciplinary team, and may reduce the staff trauma associated with the event as well as CI use moving forward (Mangaoil, Cleverley, & Peter, 2020). These clinical tools and approaches, if applied consistently in clinical practice, can improve the patient quality of care.

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### 5.2 Policy Implications

The province has been moving towards a least restraint approach over the past decade. High quality clinical information, acquired through validated clinical tools and strategies, is needed to ensure that CI use remains exclusively for acute safety issues. However, the application of behaviour management techniques, CAPs or immediate staff debriefing may require additional staff and resources. For example, allowing staff to interrupt their workflow and engage in a multidisciplinary debrief may be unrealistic, moreover including a management-level debrief with a facilitator was identified as the best practice for this method (Mangaoil et al., 2020). Similarly, while the assessment tools used in this study could be beneficial in clinical care, they are not mandated for use across the province. Unfortunately, mental health resources are limited for adult psychiatric services as mental health care in Canada is underfunded compared to other OCED countries (Centre for Addiction and Mental Health, 2021). Therefore, an effective policy would include both the standardization of assessment tools coupled with adequate financial resources and staff training to be effective. Improving patient outcomes by reducing CI use has positive implications for recovery and a lowered risk of readmission. As such, prioritizing preventative approaches to psychiatric care would be beneficial for both patients, facilities and governments.

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### 5.3 Future Research

While the aim in acute psychiatric care is not a 0% prevalence of CIs, more research is needed to determine whether current rates of CI use are reasonable. One potential area of research would be to use the available data to assess GDs in the use of CIs across different facilities in Ontario. A facility analysis would evaluate whether these GDs are systematic, or if different patterns exist in certain pockets in the network, thus providing potential targets for quality improvement achieved through staff education and training. This analysis would require information on case-mix of facilities for accurate benchmarking. As previously mentioned, more research is needed to determine how often the application of a CI is used as a “last resort”, in addition to developing criteria to guide health care staff could eliminate subjectivity in this practice. An interesting qualitative study would examine which combinations of individual behaviours are perceived as more threatening and may increase the likelihood of experiencing CIs. A future study examining combined interaction models between gender and demographic, clinical and behavioural variables is needed to compare CI use between genders for both violent and non-violent patients. More research is needed the case mix of other groups to make comparisons between genders and on whether targeting predictors of CIs are effective in reducing the odds of CI use, in particular among men. Finally, it may be useful to examine how using alternative cut points for CAPs, scales and age groups, among other variables, may influence the odds of CIs. Gender should continue to be used as a stratification variable to assess issues of equity with risk adjusters for risk of harm to others, conflict and other variables contributing to the odds of CI.

### **6.0 Limitations**

A limitation of the RAI-MH assessment is that it does not fully capture gender identity. The assessment is done in hospital so it may be that clinic staff will indicate the patient's gender on their behalf without providing opportunity to elaborate on their gender identity. While OHMRS is developing a more comprehensive gender measure, it is possible that this cell count for less common gender identifies will remain too small to use in statistical analysis, due to residual disclosure. However, this challenge does not take away the clinical value of a more comprehensive gender measure in improving quality of care to non-binary patients. In addition, this study would have been strengthened by including variables that interact with gender, such as race, ethnicity, and disability as a part of the analysis (Statistics Canada, 2018). However, it is not possible to incorporate these variables in analysis without data linking from another source, which fell beyond the scope of these thesis. Another limitation of this study was that it did not examine a combined interactions model assessing differential odds of restraint between violent and non-violent men and women. Future research examining the interactions between variables is needed. Finally, there is no information on staff characteristics or mix. It would be interesting to know if gender of staff may interact with the decision to restrain. As well, considering the nature and compounding effect of behaviours would have provided more information on how behaviours interact to influence restraint/confinement use.

### **Conclusion**

Behaviours and clinical symptoms are associated with the odds of control interventions. In general, men experience control interventions compared to women, however, gender differences to exist in the odds of experiencing CIs. Good quality clinical assessments, such as the CAPs and scales used in this study, add value to clinical planning and, if employed consistently guide treatment approaches. Continued evaluation of least-restraint care and future research is necessary to assess whether there is potential to further reduce the prevalence of CIs, improve patient outcomes and improve in-hospital processes.



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**Appendix A - Summary of Scales and CAPS****Table 10 Description of RAI-MH Scales**

<b>Scale</b>	<b>Description</b>	<b>Individual Items Included</b>	<b>Scale Values</b>	<b>Value Descriptions</b>
Aggressive Behaviour Scale (ABS)	Measure of frequency and diversity of aggressive behaviours	Verbal abuse, physical abuse, socially inappropriate or disruptive and resists care	0 1-2 3-4 5-12	No aggression Mild aggression Moderate aggression Severe aggression
Cognitive Performance Scale (CPS)	Describes the person's cognitive status	Short-term memory, daily decision-making, self-performance in eating, and ability to make self-understood by others	0 1-2 3-4 5-6	Intact Mild impairment Moderate impairment Severe impairment
Depressive Severity Index (DSI)	An alternative measure to Depression Rating Scale for symptoms of depression	Sad and pained facial expressions, negative statements, self-deprecation, guilt/shame, hopelessness	0 1-2 3-5 6-15	None Mild impairment Moderate impairment Severe impairment
Mania	A measure of frequency of symptoms of mania	Inflated self-worth, hyper-arousal, irritability, increased sociability/hypersexuality, pressured speech, labile affect, and sleep problems due to hypomania	0 1-2 3-5 6-20	None Mild mania Moderate mania Severe mania
Positive Symptoms Scale (PSS): short	A measure of the frequency of positive symptoms	History of suicide attempts, positive symptoms scale, depressive severity scale, family concerned re: self-injury, cognitive performance scale, and suicide plan	0 1-2 3-8 9-12	None Mild Levels of PSS Moderate Levels of PSS Severe Levels of PSS
Risk of Harm to Others (RHO)	A measure that reflects the risk of harm to others	ABS, PSS long, violence summary scale (VSS), sleep problems, insight into mental health, delusions, and difficulty sleeping	0 1-2 3-4 5-6	None Mild RHO Moderate RHO Severe RHO
Severity of Self-harm (SoS)	Reflects risk of harm to oneself	History of suicide attempts, positive symptoms scale, depressive severity scale, family concerned re: self-injury, cognitive performance scale, and suicide plan	0 1-2 3-4 5-6	None Mild Risk of Self-Harm Moderate Risk of Self-Harm Severe Risk of Self-Harm

*Note: These scales can be used to evaluate an individual's current clinical status over time and can also be evaluated and compared. Each scale has been validated against a comparable pre-existing "gold standard" measures*

## Appendix A - Summary of Scales and CAPS Con^t

Table 11 Description of RAI-Mental Health Clinical Assessment Protocols (CAPs)

Category	CAP	Scale Values	Value Descriptions
Safety	Harm to Others (Harm CAP)	-	Identifies those who are at:
		0	Low risk of harming to others
		1	Moderate risk of harming to others
	Suicidality and Purposeful Self-Harm (Self-Harm CAP)	2	High risk of harming to others
		-	Identifies those who are at:
		0	Low risk of suicide or intentional self-harm
Social Life	Interpersonal Conflict* (Conflict CAP)	1	Moderate risk of suicide or intentional self-harm
		2	High risk of suicide or intentional self-harm
		-	Identifies those who are at:
	Social Relationships (Social CAP)	0	Low risk of experience conflict with others
		1	Moderate risk of experience conflict with others
		2	High risk of experience conflict with others
	Traumatic Life Events (Trauma CAP)	-	Identifies those are at risk/experience:
		0	Low social isolation/family dysfunction
		1	Moderate social isolation/family dysfunction
	Criminal Activity (Criminal CAP)	2	High safety social isolation/family dysfunction
		-	Identifies those who experienced:
		0	Low safety needs or ongoing impact of prior trauma
Health Promotion	Substance Use ** (Substance Use CAP)	1	Moderate safety needs or ongoing impact of prior trauma
		2	High safety needs or ongoing impact of prior trauma
		-	Identifies those who are at:
	0	Low risk of violent/nonviolent criminal behaviour	
	1	High risk of violent/nonviolent criminal behaviour	
	2	High risk of abusing substances	

*Note: A CAPs support clinical decision making by identifying to whether and how to intervene can be explored with the individual*

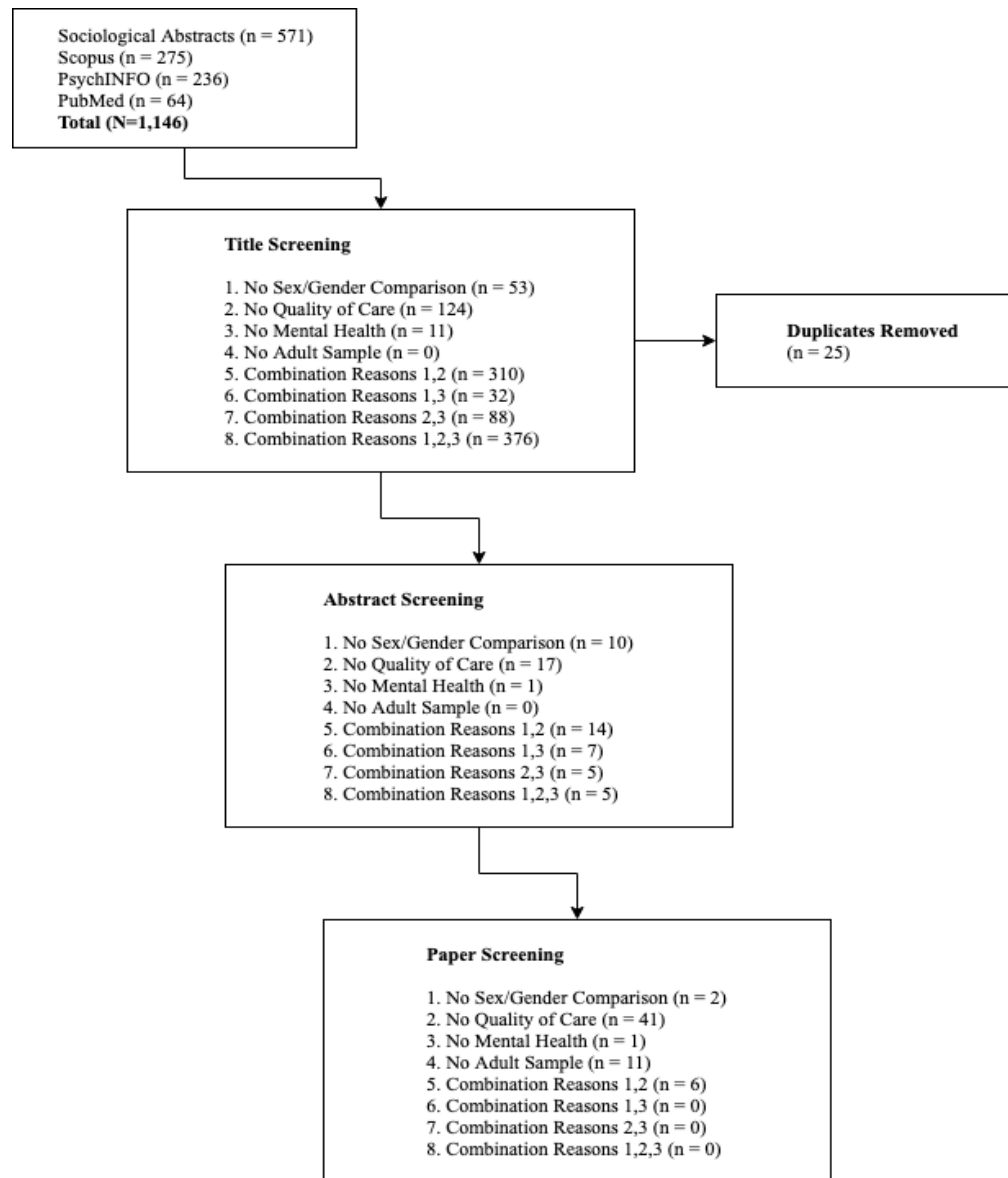
*\* Includes ongoing hostility and criticism*

*\*\* Considers current or historical substance abuse*



**Appendix B - Literature Search Results**

**Figure 7 Exclusion Criteria and Results - Gender Differences in Psychiatric Treatment**



## Appendix B – Literature Search Results Cont

Table 12 Relevant Articles Results Table - Gender Differences in Psychiatric Treatment

Title	Author(s)	Purpose	Sample	Design	Quality Indicator	Main Outcomes
Gender difference on patients' satisfaction and expectation towards mental health care	Bener & Ghuloum, 2013	Determine gender differences in patient satisfaction and expectation for care provided by psychiatrists	1,300 Qatari and Arab Psychiatry Patients (18-65)	Prospective Cross-Sectional (Scopus)	Patient Satisfaction	Men reported greater satisfaction with psychiatric care compared to females, with the greatest satisfaction being reported in the 18-35 age group. Males also expected more of their physicians
Quality of Diabetes Care for Individuals with Comorbid Chronic Psychotic Illness: A Sex-Based Analysis	Church Barker, Kurdyak, Jacob & Vigod, 2017	Determine whether quality of diabetes care differs between men and women with chronic psychotic illness	All 26,259 Ontario Patients with Schizophrenia and Diabetes (20-104)	Population-Based Cohort (Scopus)	Continuity of Care, Patient Follow-Up, Medication Management	75% of individuals with psychotic illness did not receive the minimum number of diabetes-related tests as recommended by national guidelines. Women received better care than men
Disparities by Sex Tracked in the 2015 National Healthcare Quality and Disparities Report	Moore, Mompe & Moy, 2018	Analyze sex differences and trends in health care access as a part of the National Quality Strategy	All non-institutionalized men and women in the US (18+). Likely a value < 240,185,952*	National Cross-Sectional (Scopus)	Mental Health Care Access	Women received worse care than men 20% of the time. Women experience more barriers to care, in particular financial barriers or inconsistent health coverage. Women required more services to achieve similar outcomes
Gender and the relative importance of mental health satisfaction domains	Robillos, Lale, Wooldridge, Heller & Sarkin, 2014	Investigate the relationship between gender, mental health service domains and satisfaction	3,715 San Diego Patients Receiving Psychological Services	Retrospective Cross-Sectional (PubMed)	Patient Satisfaction, Functioning, Quality of life, Clinical Status	Relationship between satisfaction and access to services, social connectedness and improved functioning was stronger for men than women
Gender differences in metabolic monitoring of second-generation antipsychotic prescription	Verdoux, Boulon & Cougnard, 2008	Explore what impacts metabolic monitoring guidelines of patients receiving antipsychotics in clinical practice	219 Psychiatrists Treating French Patients Receiving at Least One SGAP Prescription	Retrospective Cohort (PubMed)	Preadmission Care, Follow-Up Care	Patient's gender was the only characteristic associated with the number of assessed metabolic parameters prior to antipsychotic prescription, which was significantly lower in females
Helpful and unhelpful therapy experiences of LGBT clients	Israel, Gorcheva, Burnes & Walther, 2008	Identify a range of variables that characterize the helpful/unhelpful therapy of LGBT individuals	42 USA LGBT Patients Who Had Received Counselling	Retrospective Cohort (PubMed)	Patient Satisfaction, Service Fit	Client-level variables, service-level variables and therapist behaviors (availability) affect LGBT individuals' experiences in therapy
Differences in Depression Care for Men and Women among Veterans with/without Psychiatric Comorbidities	Lam et al., 2017	Assesses the gender differences in depression care among veterans using longitudinal electronic measures	110,603 USA Veterans Accessing Primary Care for Depression	Cross-Sectional (PubMed)	Continuity of Care, Follow-Up, Providers Contact, Diagnosis, Rx Management, Tx within 30 days	Women had better rates of depression care (follow-up, appropriate prescription, psychotherapy visits, specialist visits, diagnosis within 180 days of first visit) than men.