

**Pediatric Mental Illness in the Emergency Department: Understanding the Individual,
Family and Systemic Factors in Return Visits**

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Abstract

This dissertation addresses some of the gaps in the research on pediatric mental health (MH) repeat visits to the emergency department (ED). The primary objectives of this thesis are to systematically review the existing literature on youth MH return visits to the ED and to determine the incremental contribution of family factors in predicting these repeat ED visits.

The first study systematically reviewed and qualitatively summarized the available literature to better understand predictor of repeat visits. A search was performed using the following databases: PsycINFO, PubMed, and CINAHL. Reporting followed the PRISMA statement checklist and methodological quality was assessed using the following eight criteria: design, generalizability, breadth of predictors, reporting of effect sizes, additional outcomes, interaction terms, confounding variables, and clear definition of outcome. A total of 178 articles were retrieved; 11 articles met inclusion criteria. Findings revealed that repeat visits to the ED for MH concerns is a complex phenomenon that can be attributed to various demographic, clinical, and MH care access and utilization factors. Common predictors associated with repeat ED MH visits included socioeconomic status, involvement with child protective services, as well as previous and current MH service use. For studies using a six-month repeat window, the most common factors were previous psychiatric hospitalization and currently receiving MH services. This systematic review concluded that in order to further elucidate which variables are most significantly associated with repeat ED visits; future research should consider the use of prospective designs and the inclusion of family factors. Investigating recency and frequency outcomes may also be of importance.

The second study aimed to determine if family characteristics are significantly associated

with repeat ED visits over and above the contribution of demographic, clinical or service utilization factors. A retrospective cohort study of youth aged six to 18 years treated at a tertiary pediatric ED for a discharge diagnosis related to MH was conducted. Data were gathered from medical records, telephone interviews, and questionnaires. Of 266 participants, 70 (26%) had a repeat visit. Receiving MH services within six-months of the index visit, having a parent with a history of treatment for MH concerns, higher severity of symptoms and living closer to the hospital were significantly associated with repeat visits as well as earlier and more frequent repeat visits. Prior psychiatric hospitalization was associated with repeat visits and more frequent repeat visits, while presenting with suicidality was associated with more frequent repeat visits. Family functioning and perceived family burden were not associated with repeat ED visits.

This thesis contributes to the growing literature on ED use in pediatric patients with mental illnesses and may be clinically useful to professionals working with repeat visitors. The identification of key factors could provide essential information to ED decision-makers and lead to the development of best practices with this population.

Keywords: pediatric, mental health, emergency department, service utilization

Statement of Contributors, Collaborators and Co-Authors

This dissertation contains two journal article-style manuscripts prepared under the guidance of my thesis supervisor, Dr. Mario Cappelli. For both manuscripts, I was responsible for conceptualizing the studies, developing the hypotheses and research questions, gathering and analyzing data, and writing the manuscripts. In addition, my thesis committee, Drs. Julie Gosselin, Gary Goldfield and Elizabeth Kristjansson contributed to the development of the methodology, statistical analyses and interpretation of results.

The first manuscript was prepared in collaboration with Paula Cloutier, Christine Polihronis, Roger Zemek, Amanda S. Newton, Clare Gray, and my supervisor, Mario Cappelli and published in the March 2017 edition of the *Journal of Hospital Pediatrics*. I conceived the study with input from all the other authors, ran the literature review search, screened the search results, extracted data, assessed included studies for methodological quality, and drafted the manuscript. Ms. Cloutier provided consultation during data extraction and assessment for methodological quality, while Ms. Polihronis acted as a second rater in screening search results, extracting data, and assessing included studies for methodological quality. The other authors contributed to the revisions of the manuscript.

The second manuscript has been submitted for publication. The manuscript was prepared in collaboration with Christine Polihronis, Paula Cloutier, Roger Zemek, Amanda S. Newton, Clare Gray, and Mario Cappelli. I conceived the study with my supervisor, collected data with help from the SUPPORT staff and volunteers, analyzed, interpreted study results and drafted the original manuscript. The other authors contributed to the revisions of the manuscript.

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I dedicate this thesis to all families who accompany a family member struggling with mental illness. Your strength and perseverance in helping them access the services they need is inspiring.

Statement of Originality

I hereby certify that all of the work described within this thesis is the original work of the author. Any published (or unpublished) ideas and/techniques from the work of others are fully acknowledged in accordance with standard referencing practices.

Stephanie L. Leon

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Definitions

Mental health: A state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community (World Health Organization, 2001).

Mental illness, mental disorder and psychopathology: A condition that meets DSM-IV diagnostic criteria for mental or substance abuse disorders, which includes the presence of both significant levels of symptomatology and impairment in functioning (National Research Council & Institute of Medicine, 2009).

Mental health problems/issues/concerns: Difficulties that may be early signs or symptoms of mental (or behavioural or emotional) disorders, but may not be frequent or severe enough to meet the criteria for a diagnosis (National Research Council & Institute of Medicine, 2009).

Mental health services: Services delivered by health professionals knowledgeable in mental health, including but not limited to: psychologists, psychiatrist, social workers, crisis workers, pediatricians, psychiatric nurses, etc.

Youth: For the purpose of this thesis, children and adolescents between the ages of six and 18.

Caregivers and parents: The terms caregivers and parents are used interchangeably in this text to reduce redundancy. Nevertheless, the term caregiver is preferred as it acknowledges the fact that many children and youth are being raised by other adults such as: grand-parents, step-parents, adoptive parents, and foster parents.

Chapter 1: General Introduction

Chapter 1 aims to provide context for Study I and II by summarizing the challenges in providing mental health (MH) care to children and adolescents, the theoretical models in health behaviour research, the factors associated with emergency department (ED) visits, and the role of family in service utilization and access.

The first part of Chapter 1 provides an overview of the burden of mental disorders and its prevalence, with a special focus on children and adolescents. Then, barriers to accessing MH services for youth and their families are described in detail. Prevalence will be compared to rates of service access to describe the existing gap between MH needs and services available for children and adolescents. Next, the increasingly important role of EDs in assessing and treating youth with MH needs is highlighted. Barriers to receiving optimal care in the ED setting are also discussed. Models of service utilization are introduced to provide theoretical orientation to the inquiry into repeat visits. Finally, caregivers and families, their impact on health and mental health service utilization, and Bronfenbrenner's theoretical model are explored in detail in order to inform families' possible role in predicting child and adolescent repeat MH visits to the ED.

1. Mental Illness and the Canadian Context

Mental disorders have been recognized by the World Health Organization as having a substantial impact on individuals, families, and society (World Health Organization, 2003, 2017). Although there are differences in prevalence across certain groups, mental disorders are known to affect individuals of all ages, ethnicities, cultures, genders, and socio-economic levels of society (World Health Organization, 2003). Furthermore, compared to many chronic physical illnesses, mental disorders have an earlier age of onset and often persist into adulthood (Kessler et al., 2009). In fact, it has been estimated that up to 75 percent of all mental disorders have an

onset prior to age 24 (Kessler, Chiu, Demler, & Walters, 2005). Yet, despite this increasing awareness of the importance of addressing mental illness, multiple gaps continue to exist in prevention, identification and treatment of these disorders (Mash, 2006).

Mental disorders will affect 20 percent of Canadians at least once in their lifetime (Health Canada, 2002) and are estimated to contribute 33.9 percent of the global burden of disease (Kessler et al., 2009). In terms of fiscal burden, mental illness costs are estimated at \$51 billion annually, second only to cardiovascular disease (Kessler et al., 2009; Lim, Jacobs, Ohinmaa, Schopflocher, & Dewa, 2008; Smetanin et al., 2011; Stephens & Joubert, 2001). Despite this, MH has been one of the most neglected areas in healthcare across Canada (Kirby & Keon, 2004). In recent years, a great number of stakeholders —healthcare providers, researchers, policy experts at the federal and provincial levels— have called for the creation of healthcare reforms that would bring MH to the forefront of Canadian policy. These calls for action include the seminal reports by the Honourable M.J.L. Kirby and the Honourable W.J. Keon: “Mental Health, Mental Illness and Addiction: Overview of Policies and Programs in Canada” (2004) and “Out of the Shadows At Last” (2006). Federal and provincial governments have since developed strategy documents outlining next steps, including “Changing Lives, Changing Directions” (Mental Health Commission of Canada, 2012) and “Open Minds, Healthy Minds” (Ontario, 2011).

Furthermore, we know that mental illness does not spare children or adolescents. In fact, it is believed that up to 20 percent of Canadian and American youth suffer from a mental illness at any given time (MHASEF Research Team, 2015; Waddell, McEwan, Shepherd, Offord, & Hua, 2005). Of these, 68 to 76 percent have two or more co-occurring mental illnesses (Waddell, McEwan, Hua, & Shepherd, 2002) and experience significant functional impairment (Jane Costello & Egger, 2005). Yet, within the Canadian health care system, pediatric MH has often

been described as the “orphan’s orphan”, emphasizing its low funding priority (Kutcher, 2011; Waddell et al., 2005). Until recently, Canada has lacked a national, unifying child and youth MH policy framework that recognizes the unique MH problems of children and adolescents (Kutcher & McLuckie, 2013; Shatkin & Belfer, 2004). The “Evergreen ” initiative was created to provide strategic directions that are essential to guide service development and evaluation and to promote resource allocation (Shatkin & Belfer, 2004; The Canadian Association of Paediatric Health Centres, The National Infant Child and Youth Mental Health Consortium Advisory, & The Provincial Centre of Excellence for Child and Youth Mental Health at CHEO, 2010).

A 2015 meta-analysis, which pooled one to 12-month prevalence rates by disorder in children and adolescents, reported the following estimated worldwide prevalence rates: anxiety disorder 6.5% (CI 95% 4.7 - 9.1), attention-deficit hyperactivity disorder 3.4% (CI 95% 2.6 - 4.5), depressive disorder 2.6% (CI 95% 1.7 - 3.9), oppositional defiant disorder 3.6% (CI 95% 2.8 - 4.7), and conduct disorder 2.1% (CI 95% 1.6 - 2.9; Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015). An older study used three to six months prevalence rates in Canadian, American and British samples and estimated the prevalence rates of less common disorders as follows: substance abuse disorder 0.8%, pervasive developmental disorder 0.3%, obsessive-compulsive disorder 0.2%, schizophrenia 0.1%, Tourette’s disorder 0.1%, eating disorders 0.1% and bipolar disorder <0.1% (Waddell, Offord, Shepherd, Hua, & McEwan, 2002)¹. Finally, suicide represents the second-leading cause of death for Canadian youth aged 15-24, after unintentional injuries such as motor-vehicle accidents (Statistics Canada, 2009). These numbers are expected to rise in the future (Leitch, 2007).

¹ It should be noted that the Canadian data presented above has been estimated from several province or region wide studies. There exists no comprehensive national epidemiological survey of child/adolescent MH in Canada and it is thought that such information is essential for effectively developing and improving child MH programs, services and policies in Canada (Kirby & Keon, 2004).

Pediatric mental and substance use disorders are associated with distress and functional impairments including: decreased quality of life, school failure and lack of vocational success, poor sexual and reproductive health, peer and family problems, difficulties with employment, criminal activity, and premature death (Costello, 1989; Mash, 2006; Wissow et al., 2016). Child psychopathology also shows worsening from childhood to adolescence and beyond, particularly in those children with initial functional impairment (Costello, Angold, & Keeler, 1999). Continued struggles with mental illness can evolve into poor employment opportunities and poverty in adulthood as well as intergenerational consequences (Kirby & Keon, 2004; The National Advisory Mental Health Council Workgroup on Child and Adolescent Mental Health Intervention Development and Deployment, 2001).

Although the one-to-one relationship between childhood and adult disorders has not been demonstrated for all mental disorders, it remains evident that youth with mental disorders often continue to suffer from long-term impairments throughout their lives, diminishing their productivity and imposing further burden on society (Kessler et al., 2005; Rutter, 1995; The National Advisory Mental Health Council Workgroup on Child and Adolescent Mental Health Intervention Development and Deployment, 2001). Moreover, many health behaviour patterns that contribute to morbidity and mortality in adulthood (e.g. obesity, smoking, substance use) are established in adolescence and often co-occur with mental illness (Asarnow, Rozenman, Wiblin, & Zeltzer, 2015; Mash, 2006). Therefore it becomes clear that mental disorders beginning in childhood can have long-lasting consequences and that addressing MH concerns as early as possible is crucial not only to the wellness of the individual child or adolescent, but also in diminishing the burden on families and society.

It is widely accepted that early identification of factors associated with an increased risk

of developing mental disorders as well as early intervention holds the key to optimal long-term outcomes and decreased future impairment (The Canadian Association of Paediatric Health Centres, The National Infant Child and Youth Mental Health Consortium Advisory, et al., 2010; The Office for Special Populations National Institutes of Health & National Institute of Mental Health, n.d.). In fact, MH programs targeting children with subclinical disorders have been shown to significantly reduce symptoms (Durlak, 1998). Moreover, longitudinal studies have demonstrated that the effect of obtaining MH services in adolescence is maintained into adulthood by decreasing the likelihood of experiencing further MH concerns (e.g., Harrington, Rutter, & Fombonne, 1996).

In sum, mental illness is a national health concern that has historically been neglected despite evidence of increasing prevalence and burden of these disorders on Canadians. Furthermore, multiple gaps continue to exist in the MH system, especially in the area of child and adolescent MH. Knowing the long-lasting consequences of untreated mental illness in children and adolescents, timely and effective interventions are crucial.

2. MH Services and Barriers to Access

Despite a demonstrated need for MH services, only 7 to 32 percent of adults with a MH disorder reported receiving treatment for their concerns in the past year (Bijl et al., 2003; Bland, Newman & Orn, 1997; Kessler et al., 2005). Children and adolescents are even less likely than adults to ever have had a MH contact (Nadeau et al., 2012). In fact, less than 25 percent of Canadian youth with a diagnosed mental disorder receive specialized MH treatment services (MHASEF Research Team, 2015; Waddell et al., 2005) and this number drops to 20 percent in rural Canada (Zayed et al., 2016). Similarly, 80 percent of U.S. youth with mental issues fail to access MH care (Kataoka, Zhang, & Wells, 2002). The MH care system in Canada is deplorably

fragmented and numerous barriers to access timely, appropriate MH assessment and treatment exist (Kirby & Keon, 2004; Kutcher, 2011).

Pathways to child and adolescent MH care are often multidirectional and complex (Sayal, 2006). While some families access community services through self-referral, others are referred by their primary care provider, strongly encouraged to seek services by the school system, or discharged to community services following hospital admissions. In other words, children and adolescents can receive MH services from many settings, such as the educational system, juvenile justice system, child welfare agencies, primary healthcare providers (pediatrician, general practitioner), outpatient MH clinics/centers, EDs, inpatient psychiatric hospitalization, residential treatment centers, group homes, hospital day treatment, and others (Brannan, Heflinger, & Foster, 2003; Burns et al., 1995; Waddell, McEwan, et al., 2002). These have traditionally been divided into primary (e.g. school, general practitioner), secondary (e.g. outpatient), and tertiary (e.g. residential treatment) care (Kirby & Keon, 2004). There are also ongoing discussions about the roles and responsibilities of each setting and many are concerned about the overlap and gaps between these services (Heneghan et al., 2008).

Although children and adolescents can receive services in these settings, the availability, continuity and quality of these services have been criticized. Many system- and community-level barriers exist for youth and their families seeking to access MH care. These barriers include: (1) fragmentation of MH services, (2) lack of funding and staff shortages, (3) lengthy wait times, (4) ongoing stigma attached to mental illness, and (5) lack of evidence-based treatments (Kirby & Keon, 2004; The Canadian Association of Paediatric Health Centres, The National Infant, Child, & The Provincial Centre of Excellence for Child and Youth Mental Health at CHEO, 2010; The National Advisory Mental Health Council Workgroup on Child and Adolescent Mental Health

Intervention Development and Deployment, 2001). The following section explores these barriers in more detail.

Fragmentation of MH services. The MH care system is not an actual system but rather an uncoordinated amalgamation of service providers operating under different jurisdictions (federal, provincial, municipal; Kutcher, 2011). The most salient example are the addiction services which have been historically separated from MH services, leading to two separate systems of care (Roberts, Ogborne, Leigh, & Adam, 1999). Mental disorders are often an exclusion criterion for the treatment of addictions and vice versa (Roberts et al., 1999). Knowing that problems with addictions are highly co-morbid with other MH disorders, this separation is counterintuitive (Armstrong & Costello, 2002). Another consequence of these differing jurisdictions is an absence of a clear authority and varying capacity and quality of services available (Kirby & Keon, 2004).

The MH system is also poorly coordinated. All stakeholders (youth, families, and health providers) agree that it is quasi-impossible for anyone to navigate the system with ease (Boydell et al., 2006; Cappelli & Leon, 2017; Kirby & Keon, 2004). Parents must become experts and informed consumers of MH services to successfully access the right services for their child (The Canadian Association of Paediatric Health Centres, The National Infant Child and Youth Mental Health Consortium Advisory, et al., 2010).

On average, families are seeking help for two MH problems, contacting five different agencies/professionals and receiving two treatments at a time (Shanley, Reid, & Evans, 2008). In a survey of the general population, 25 percent of parents were not aware of any treatment programs in their region which means a steep learning curve for many caregivers (Anderson, Kutcher, & Connell, 2010). Furthermore, as with other medical services, MH services are

physically fragmented and distributed unevenly across Canada, even though the need for MH care in rural communities is just as high as in urban areas (Zayed et al., 2016). Fortunately, in the last decade, efforts have been made to support tele-MH (also e-MH, telepsychiatry, telemedicine) care initiatives and programs to reach remote communities (Hilty et al., 2013; Hilty, Yellowlees, Myers, Parish, & Rabinowitz, 2016; Paing et al., 2009).

This fragmentation and poor coordination highlights the need for a more integrative and collaborative approach to MH care (Ontario Medical Association, 2015). However, most health providers lack the training to understand other professionals' scope of practice and to communicate effectively (Greene, Ford, Ward-Zimmerman, & Foster, 2015). For example, very few primary care providers are aware of the differences in training between MH professionals, their scope of practice or how they operate (Cappelli & Leon, 2017). Likewise, few MH providers clearly understand how primary and tertiary care providers need to operate within a publicly funded system or what information they require to coordinate physical and MH services (Cappelli & Leon, 2017). This lack of knowledge can breed negative attitudes on the part of some providers toward the contributions of other providers, which reduces their willingness to collaborate (Kates et al., 1996). As a result of infrequent clinical information sharing, youth and their families are left baffled by the inconsistencies between agencies/providers and often become unwilling communication bridges (Greene et al., 2015).

Finally, there is a financial barrier to better collaboration and coordination. For physicians, there are many disincentives to taking on patients with MH concerns; current billing codes have been criticized because capitation systems, which allocate a fixed fee-per-patient, do not take into consideration the higher burden of care required when working with a new or exacerbated MH condition or with a patient who has both physical and MH problems (Centre for

Addiction and Mental Health, 2016). Furthermore, current systems of remuneration do not cover indirect (non-client contact) services such as case discussions, referral input, or consultation (Kates et al., 1996). Similarly, MH professionals within clinics or agencies structures also do not receive incentives to collaborate as there is no time and no remuneration for work related to collaboration with other providers (Cappelli & Leon, 2017).

Lack of funding and staff shortages. Lack of funding is one of the most important barriers to availability and quality of MH care (Reid & Brown, 2008). As described earlier, the pediatric MH system has often been described as the “orphan’s orphan” of Canadian health care, which emphasizes the chronic underfunding of youth MH treatments (Kirby & Keon, 2004). Although the financial cost of MH services is considerable, the direct and indirect costs to society of not providing appropriate services for pediatric MH disorders are much greater (Mash, 2006; McGorry, Purcell, Hickie, & Jorm, 2007). This includes the loss of productivity associated with failure to complete high school, criminal justice costs, loss of work due to MH, loss of taxes, and employment insurance premium revenues, increased support costs, and increased medical costs of associated physical conditions (Mash, 2006; McGorry et al., 2007). According to Access Economics, for every \$1 spent on prevention and treatment of pediatric mental illness, there is a \$3.26 to \$5.60 return on investment (Mathias et al., 2015).

Insufficient funding is also linked to a shortage of human resources in MH professions (Kirby & Keon, 2004). Issues surrounding this workforce crisis include challenges in recruiting, keeping and training staff, particularly in rural communities (Hoge et al., 2009; Reid, Tobon, & Shanley, 2008; Sarma & Peddigrew, 2008; Thomas & Holzer, 2006). The large client loads faced by many providers as a result is also a deterrent (Collaborative Working Group on Shared Mental Health Care, 2000). For families, the high cost of care and insurance restrictions on MH

services is major barrier to adequate access to community-based services (Kelleher, Taylor, & Rickert, 1992).

Although community-based agencies are usually publicly funded and provincial health plans cover physician-delivered treatment, psychotherapy provided by MH professionals (psychologists, social workers, counsellors) in private practice is fee-for-service and can quickly become very costly. Other financial concerns include the location and hours of operation of MH services (The Canadian Association of Paediatric Health Centres, The National Infant Child and Youth Mental Health Consortium Advisory, et al., 2010). MH appointments often require families to take time off work and take their child out of school. Families with lower financial means or older adolescents seeking services on their own, transportation restrictions and increased cost associated with travel can lead to poor attendance (The Canadian Association of Paediatric Health Centres, The National Infant Child and Youth Mental Health Consortium Advisory, et al., 2010). To resolve some of these issues, it has been proposed that MH services become funded under the provincial health care plan, similar to other medical disorders (Moulding et al., 2009).

Lengthy wait times. Demand for MH services is high and increasing while availability of appropriate providers is low (Healy, Naqvi, Meagher, Cullen, & Dunne, 2013), resulting in long waitlists. Although, wait times can vary depending on region, services and clinical priority level, in Canada, there is few reliable data on wait times for youth MH services which hamper our ability to tackle this problem (The Canadian Association of Paediatric Health Centres, The National Infant Child and Youth Mental Health Consortium Advisory, et al., 2010). A survey of MH agencies across Canada showed that wait times can easily reach 12 months, which greatly exceeds the Canadian Psychiatric Association's proposed wait time benchmarks of 24 hours for

emergent care, two weeks for urgent care, and one month for scheduled care (Canadian Psychiatric Association, 2006; Kowalewski, McLennan, & McGrath, 2011; Office of the Auditor General of Ontario, 2016).

This is an even greater problem in rural/remote areas where the availability of MH providers with specific child and adolescent knowledge is scarce (Zayed et al., 2016). Lengthy wait times also present a second indirect barrier to MH access; the longer an individual is on a waitlist, the less likely they will attend or enter treatment once an appointment is made (Reid & Brown, 2008; Sherman, Barnum, Buhman-Wiggs, & Nyberg, 2009). Furthermore, it should not be forgotten that there is often a waitlist for assessment and then a second waitlist for treatment, making the process of obtaining MH treatment extremely lengthy (The Canadian Association of Paediatric Health Centres, The National Infant Child and Youth Mental Health Consortium Advisory, et al., 2010).

Ongoing stigma attached to mental illness. Although there have been efforts to decrease MH stigma (e.g. awareness campaigns), it nevertheless continues to be a significant barrier, especially in rural areas (Boydell et al., 2006; Pescosolido, 2016). Stigma is still present in our language; often individuals with mental disorders are identified by their disorders (e.g. a schizophrenic) while people with a physical disease are identified as suffering from a disease (e.g. having cancer; Link & Phelan, 2001). For the public, mental illness, even in youth, continues to be linked to a potential for violence, especially in regards to school shootings (Pescosolido et al., 2008).

Stigma also prevents some individuals from seeking the help they need. For example, in a survey of Canadians, 63 percent of youth reported that embarrassment, fear, peer pressure and stigma would likely keep them from accessing services while 38 percent of parents would be

embarrassed that their child suffered from a MH disorder (Davidson & Manion, 1996; Kinark Child and Family Services, 2007). Furthermore, stigma is still present in how individuals are treated by health professionals. Particularly, considering their pivotal role in MH care, it is surprising to learn that some primary care physicians, emergency physicians, and MH professionals have been criticized for having negative attitudes towards individuals with mental illness (Kirby & Keon, 2004; Wahl & Aroesty-Cohen, 2010).

Lack of evidence-based treatments. Not only are Canadian children and adolescents not receiving services; few of the services available are evidenced-based, effective or tailored to youth (The Canadian Association of Paediatric Health Centres, The National Infant Child and Youth Mental Health Consortium Advisory, et al., 2010). MH research has long focused on adults and has only recently made significant advances in the area of pediatric MH (Dolan, Fein, & The Committee on Pediatric Emergency Medicine, 2011). As a consequence, most currently-used pediatric practices have been developed through inferences from adult MH service research (Dolan et al., 2011).

This is a problem since many treatments and services children and adolescents typically receive have not been evaluated to determine their efficacy across developmental periods (The National Advisory Mental Health Council Workgroup on Child and Adolescent Mental Health Intervention Development and Deployment, 2001). Worse, even when interventions are recognized as effective for children and adolescents, they are seldom made widely available (Kirby & Keon, 2004). For example, out of the 15 tertiary pediatric centers across Canada, only two reported using evidence-based guidelines, assessment tools, or policies in their ED based on published research evidence or governmental policies, while the rest were based on local clinical experience and evidence (Leon et al., 2013). Finally, relevant outcome indicators for children

and adolescents are not routinely collected and few evaluations of the MH system have been conducted in order to determine the effectiveness of MH services. Therefore, accessing services does not guarantee that the treatments received are adequate (Yang, Kurdyak, Guttman, & MHASEF Research Team, 2016).

In sum, there exist many barriers for child and adolescent to access MH care in Canada. In view of these considerable challenges, it is not surprising that less than one in four Canadian youth who require MH services actually receives any services. There is therefore a clear need for more clinically-relevant research on how we can help youth and their families' access MH services as well as on how these services can be more effective.

3. The ED

There has been a noticeable surge in the number of ED presentations for pediatric MH problems in Canada and the US over the past 15 years (Baren, Mace, Hendry, Dietrich, Grupp-Phelan, et al., 2008; Canadian Institute for Health Information, 2015; Dolan et al., 2011; Gandhi et al., 2016; Grupp-Phelan et al., 2007; Mahajan et al., 2009; Mapelli, Black, & Doan, 2015; Newton et al., 2009; Pittsenbarger & Mannix, 2014; Rogers, Mulvey, Divietro, & Sturm, 2017; Sills & Bland, 2002). MH issues account for up to 5 percent of all emergency visits (Chan, Schull, & Schultz, 2001; Christodulu, Lichenstein, Weist, Shafer, & Simone, 2002; Mahajan et al., 2009; Mapelli et al., 2015; Mccaig, Nawar, & Division of Health Care Statistics, 2006; Pittsenbarger & Mannix, 2014) and 10 percent of all hospitalizations (Bardach et al., 2014). Although children and adolescents will typically first seek help for MH concerns within the educational system or with their primary care provider (Rickwood, Deane, & Wilson, 2007; Shanley et al., 2008), we know that 53.5 percent of ED MH visitors had no prior outpatient contact (Gill et al., 2017).

The MH problems children and adolescents present with are varied. For example, in one study, 21 distinct diagnoses were given out of 150 presentations (Baren, Mace, Hendry, Dietrich, Goldman, et al., 2008). The top reasons for visiting the ED, as reported by both caregiver and youth, were suicidal thoughts, depression/low mood/unstable mood, suicide attempt, anxiety, and intentional self-harm (Cloutier et al., 2010). For many youth and families in crisis, EDs are the logical place to receive services since they are open 24 hours a day and 7 days a week and do not require an appointment or referral (Padgett & Brodsky, 1992). For this reason, the ED has been described as being the “safety net” of our fragmented MH system (American Academy of Pediatrics & American College of Emergency Physicians, 2006; Costello et al., 1999).

Many have speculated as to the reason(s) behind the dramatic increase in MH presentations to the ED. Some point to the reduction in MH professionals, shortened inpatient stays and funding issues (Geller & Biebel, 2006), while others believe an increased awareness of MH issues (especially suicidality) coupled with difficulty with access has led EDs to absorb the influx of new or ongoing problems (Baren, Mace, Hendry, Dietrich, Grupp-Phelan, et al., 2008; Chun, Sindelar-Manning, Eaton, Lewander, & Spirito, 2008; Grupp-Phelan et al., 2009). Supporting this latter hypothesis, up to 50 percent of visits are made because of concerns over suicidality (Gipson, Agarwala, Opperman, Horwitz, & King, 2015; Peterson, Zhang, Santa Lucia, King, & Lewis, 1996).

In a study looking at perceptions related to MH ED visits, they found that the top three expectations of caregivers in visiting the ED were to receive: help/guidance for their child (41.9%); assessment, evaluation, and diagnosis (29.1%); and health care/professional resources (19.2%). Youth expectations tended to be less specific since many reported: they wanted help/guidance for themselves (40.7) and/or to get/feel better (10.6%), while some did not know

what they expected (17.6%) and/or expected nothing (10.6%; Cloutier et al., 2010). Youth and their families reported that the main stressors underlying their current MH concerns were school (e.g., grades, learning difficulties, problems with teachers), issues with parents (e.g., fighting with parents, lack of communication, lack of involvement), and problems with friends/peers (e.g., no friends, not getting along with friends, dating issues, bullying; Cloutier et al., 2010).

Apart from the barriers already mentioned in accessing MH services, there are challenges and issues unique to providing MH care in the ED. Some of these barriers include (1) time constraints and availability of MH services, (2) climate of the ED, (3) uniqueness of MH presentations, (4) staff attitude and MH training, and (5) consent and legal issues surrounding children, adolescents and families. These issues are important to explore since the manner in which youth and families experience the ED will shape their perceptions of the MH service system and might impact their future involvement with it (Clarke, Dusome, & Hughes, 2007). The following section explores these barriers in more detail.

Time constraints and availability of MH services in the ED. EDs are busy environments with important time constraints. The ED's primary attention to life-threatening priorities can hinder recognition and assessment of MH issues (Baren, Mace, Hendry, Dietrich, Grupp-Phelan, et al., 2008). Furthermore, when children and adolescents seek care in general EDs, adequate pediatric MH services and professionals are often nonexistent (Dolan et al., 2011; Tossone, Jefferis, Bhatta, Bilge-Johnson, & Seifert, 2014). Even in pediatric EDs, a wide variety of MH services exist, such as on-site or off-site psychiatric consult, MH nurse, and/or social worker (Leon et al., 2013). Although the AAP Joint Policy Statement recommends that EDs have adequate MH resources in the form of a skilled multidisciplinary team which can provide links to outpatient and or inpatient services, these structures are often underdeveloped (American

Academy of Pediatrics & American College of Emergency Physicians, 2006; Leon et al., 2013). Moreover, the timing of a visit can make a difference. For example, 67 percent of youth presented outside the 8am to 6pm time window (Clarke et al., 2007). Weekend and after business-hours presentations are thought to reflect the fact that most MH services are only available Monday to Friday from 9am to 5pm (Clarke et al., 2007). Despite this, even within the ED, access to psychiatry consultation and referrals to community resources are often unavailable outside of regular hours and families need to wait until morning to obtain the care they need (Clarke et al., 2007).

Climate of the ED. The ED is by nature a very stressful and unfamiliar environment; waiting rooms are typically crowded and wait-times are several hours long, all of which can be barriers to optimal care (Baren, Mace, Hendry, Dietrich, Goldman, et al., 2008; Chun, Katz, Duffy, & Gerson, 2015). For youths experiencing a MH crisis, the ED environment can increase their distress and agitation (Chun et al., 2015). In fact, for many individuals with mental disorders, a typical ED is considered over-stimulating and frightening (Clarke et al., 2007; Dolan et al., 2011). In interviews with adults and their families about their experience of the ED, they stated the lack of privacy as a major issue as it had exacerbated their distress (Clarke et al., 2007). Furthermore, patients who were brought in by police or being watched by security staff reported that they felt like criminals instead of legitimate patients suffering and seeking assistance (Clarke et al., 2007). Some have posited that the creation of safe rooms or designated security areas might insure more privacy and safety (Chun et al., 2015; Stewart et al., 2006).

The experience of visiting an ED for a child or adolescent is even more foreign than for adults. Circumstances such as separation from parents for assessment or procedures can be extremely upsetting (Hemmelgarn, Glisson, & Dukes, 2001). Moreover, the experience is also

negative for caregivers: they often feel powerless, incompetent and guilty in being unable to relieve their child's distress (Hemmelgarn et al., 2001).

Uniqueness of MH presentations. MH concerns can be unique in their level of complexity and can disrupt the regular flow of the ED (Clarke et al., 2007; Dolan et al., 2011). For example, some youth experiencing a MH crisis might come in demonstrating difficult to manage behaviours such as aggression or with major personality disorders (Fallon, 2003; Pane, Winiarski, & Salness, 1991). There is a large body of literature and debate on the use of restraints (whether physical, pharmacological or other) in the ED for both adults and children (Baren, Mace, Hendry, Dietrich, Goldman, et al., 2008; Sorrentino, 2004). Furthermore, presenting symptoms of mental illness are often non-specific, making it difficult to arrive at a clear cut diagnosis quickly (Clarke et al., 2007). Sometimes MH emergencies are not even recognized as such (American Academy of Pediatrics & American College of Emergency Physicians, 2006) since mental illness can present as a somatic illness, especially in children, leading to multiple medical tests and sometimes inappropriate treatment (Baren, Mace, Hendry, Dietrich, Grupp-Phelan, et al., 2008). Nevertheless, it is important for physicians to rule-out medical (organic) cause for behavioural issues as some of these might be reversible if identified early (Baren, Mace, Hendry, Dietrich, Goldman, et al., 2008).

Furthermore, collateral information is often difficult to obtain making assessments longer than usual (Fleet et al., 2003). In the adult population, patients with MH concerns spent an average of two hours longer in the ED than those with medical or trauma presentations (Clarke et al., 2005). The evaluation of patients presenting with self-harm behaviours or with suicidality also presents a number of challenges and can be stressful for providers unaccustomed to assessing suicidality (Stewart, Manion, & Davidson, 2002; Zun, 2012). Similarly, disposition

and the decision to admit are just as challenging (Zun, 2012).

For families who distrust the medical system or have delayed seeking help, mostly because of stigma, the ED might be their first and only interaction with the medical system for MH issues (Baren, Mace, Hendry, Dietrich, Grupp-Phelan, et al., 2008). Issues related to race/ethnicity, culture, language and stigma are therefore crucial to understand and consider (American Academy of Pediatrics & American College of Emergency Physicians, 2006; Baren, Mace, Hendry, Dietrich, Grupp-Phelan, et al., 2008). For example, racial/ethnic factors were found to be associated with clinical diagnosis decisions in the U.S., such that African American and Hispanic/Latino youths were more likely to receive a diagnosis of psychotic and behavioural disorder than White youth (Muroff, Edelsohn, Joe & Ford, 2008). African-American, Asian American/Pacific Islander and American Indian/Alaska Native children were also found to be more likely to use the ED for MH concerns, but much less likely to receive other MH care (Snowden et al., 2008; Snowden, Masland, Fawley & Wallace, 2009). This pattern suggests crisis-oriented help-seeking behaviour in some ethnic minorities as well as disparities in MH care and access (Snowden et al., 2009).

Health provider attitude and MH training. Another barrier to MH care in the ED is service provider MH training and attitudes towards mental illness. Many ED staff lack the necessary training to adequately address MH concerns (Chun et al., 2015; Dolan et al., 2011). It has also been shown that many ED personnel lack the skills to assess and treat MH patients effectively, especially when developmental issues are present (Chun et al., 2015; Clarke et al., 2007; Dolan et al., 2011; Smart, Pollard, & Walpole, 1999). For example, triage nurses' accuracy of assessment for MH problems was found to be much lower than for medical presentations (Happell, Summers, & Pinikahana, 2002; Hay, Bekerman, Rosenberg, & Peled, 2001). Lack of

knowledge and overall expertise can create tension around the care of psychiatric patients (Clarke et al., 2007). It is therefore not surprising that patients often perceive ED staff as uncompassionate and insensitive to their condition (Clarke et al., 2007).

Furthermore, the complexity and stigma attached to certain disorders have also made certain patients feel unwelcome. Borderline personality disorder, trauma histories, and co-occurring substance abuse disorders were at the top of the list of unwelcomed diagnoses (Clarke et al., 2007). In a study of adult MH patients, their satisfaction with services was adversely affected when ED staff qualified their visit as inappropriate or belittled their symptoms (Olsson & Hansagi, 2001).

Interestingly, it was demonstrated that staff attitudes and perceptions ranged widely from ED to ED and were shaped by the organization in which they worked (Hemmelgarn et al., 2001). For example, in some hospitals, part of their mandate is to provide emotional support for families (Hemmelgarn et al., 2001). This attitude also makes it more acceptable for staff to support each other emotionally, which can lead to less emotional exhaustion and an increased capacity to care for youth and families in distress (Hemmelgarn et al., 2001). This is important since the responses of ED staff can affect the emotional well-being of both children and parents (Flynn & McCollum, 1993).

Consent and legal issues surrounding children, adolescents and families. Psychiatric emergencies for children and adolescents differ from those of adult patients in many ways. Fifty-six percent of youth present to the ED with their caregiver (Grupp-Phelan et al., 2009).

According to some researchers a child in crisis indicates a family in crisis (Londino, Mabe, & Josephson, 2003). Unlike adult patients, children might not necessarily have full confidentiality vis-à-vis their parents depending on their age, capacity to consent and health provider

characteristics (Clarke et al., 2007; Wadman et al., 2014). This information sharing is usually not a concern for young children; however it requires careful balance in treating adolescents (O'Malley, Brown, & Krug, 2008). Healthcare providers need to respect the increasing independence of adolescents by integrating their input while still communicating relevant information to the parents (O'Malley et al., 2008).

This becomes an even bigger issue when the youth comes of age of informed consent and the roles are reversed; youth are getting all the information and parents are asked to step back. For this reason, limits of privacy and confidentiality should be well delineated to both the youth and their caregivers (Baren, Mace, Hendry, Dietrich, Grupp-Phelan, et al., 2008). Another problem is determining legal guardianship in the ED. This can arise when parents are separated or divorced or when the child is a ward of the state (Fortunati & Zonana, 2003). Moreover, this issue becomes a real challenge when patients, mostly adolescents, present unaccompanied or involuntary treatment is being considered (Baren, Mace, Hendry, Dietrich, Grupp-Phelan, et al., 2008).

Other legal concerns surrounding youth exist. When assessing any child, health practitioners have to be sensitive to the issue of abuse which can be delicate in assessing and time consuming if it becomes apparent that there is a duty to report (Fortunati & Zonana, 2003). Furthermore, if the child is thought to be in danger from his or her parents or in the home environment, alternative care needs to be arranged (Fortunati & Zonana, 2003). Knowing that children and adolescents who have suffered trauma in the form of abuse often develop MH problems, this challenge becomes a common reality (Spataro, Mullen, Burgess, Wells, & Moss, 2004). There might also be disagreement between caregiver(s) and physician on the cause of the youth's distress as well as with the recommended disposition. For example, some families might

perceive hospitalization as a success while ED staff might perceive referral to community resources as the most appropriate outcome (Clarke et al., 2007). When disagreements over treatment occur, the role of the ED health care professional is to provide the necessary information to allow an informed decision (O'Malley et al., 2008). It is crucial that families, as well as youth, feel supported in this highly stressful time.

Finally, youth might not be the only ones suffering from a mental disorder; caregivers might also be battling with their own issues. In a study examining pediatric presentations to the ED, researchers found that 25 percent of children with a MH problem causing some level of impairment had a mother with a MH problem (Grupp-Phelan et al., 2007).

In sum, the ED is playing an increasingly critical role in the care of youths with MH concerns. However, the ED is a unique setting where time, space and providers are limited. Youth and their families therefore face many barriers when they present to the ED with MH complaints. The main barriers discussed were: availability of services, the ED environment, consent and legal issues surrounding children, adolescents and families, and staff attitude and training. In view of significant increases in MH presentations to the ED, known overcrowding in EDs and associated effects to quality of care (Bernstein et al., 2008), it has been recommended that MH presentations to the pediatric ED be studied further (American Academy of Pediatrics & American College of Emergency Physicians, 2006; The Canadian Association of Paediatric Health Centres, The National Infant Child and Youth Mental Health Consortium Advisory, et al., 2010).

4. ED Visitors

In order to better understand who presents to the emergency room for MH concerns, many studies have been interested in characteristics and predictors of pediatric MH visits

(Kennedy, Cloutier, Glennie, & Gray, 2009; Mutlu et al., 2015; Peterson et al., 1996; Pickner et al., 2016; Pittsenbarger & Mannix, 2014; Rogers et al., 2017; Sun, Abraham, Slack, & Skrepnek, 2014). However, a systematic review of the literature has found significant inconsistencies in data collection and reporting, making it difficult to gain a clear understanding of who these patients are (Goldstein & Horwitz, 2006)

Overall, MH visitors are more likely to be older (Kennedy et al., 2009; Mutlu et al., 2015; Peterson et al., 1996; Pickner et al., 2016; Pittsenbarger & Mannix, 2014; Rogers et al., 2017; Sun et al., 2014) and female (Kennedy et al., 2009; Mutlu et al., 2015; Peterson et al., 1996; Pittsenbarger & Mannix, 2014; Sun et al., 2014). In the Peterson study (1996) this was particularly true for suicide attempters and ideators, while those with behavioural difficulties were most often younger and male. Similarly, in Kennedy et al. (2009), children were more likely to present with externalizing disorders and adolescents with internalizing disorders. Moreover, while adolescent females were more likely to present with self-injury, depression and sexualized behaviour, males were more likely to present with aggression and psychosis (Kennedy et al., 2009). This highlights the importance of examining variable interactions.

Race/ethnicity is another factor that is predictive of ED visits; some studies found that minority status increased the odds of visiting (Peterson et al., 1996; Pickner et al., 2016), while other have found that whites were more likely to visit (Pittsenbarger & Mannix, 2014; Rogers et al., 2017). Crown wards were also more likely to visit the ED in one study (Rhodes et al., 2012). Furthermore, children and adolescents with suicidal ideation/attempts and self-injury (Peterson et al., 1996; Sun et al., 2014), comorbid developmental disorders (Sun et al., 2014), and co-morbid health problems (Sun et al., 2014) were more likely to present to the ED.

Studies have also found that day and time of year also had an effect on visits to the ED.

In one study, those with suicidal ideation were more likely to present on weekdays during the school year while those presenting with behavioural difficulties were more likely to present on weekends and vacation periods (Peterson et al., 1996). In another study, ED visits were more common during the school year and during weekdays, while it was more common for younger children to present during the day, it was more common for adolescents to present in the evening or early morning (Goldstein, Silverman, Phillips, & Lichenstein, 2005). Time-of-day has also been investigated and presentations were found to be more likely to occur outside of regular business hours (8am - 6pm) (Stewart et al., 2006). Finally, children and adolescents with past outpatient services (Mutlu et al., 2015) and living in rural areas (Pittsenbarger & Mannix, 2014) had a decreased likelihood of visiting the ED for MH concerns.

In sum, ED visitors tend to be female, older, present with comorbid disorders or suicidality, during weekdays and after-hours. However, there remains a paucity of clinical evidence surrounding the optimal care children and adolescents with MH concerns should receive in the ED. There exists no review or critical analysis of the literature in this area to orient future research and no theoretical model has been proposed to investigate variables more formally.

5. Pediatric MH Return Visits to the EDs

Studies have found that a substantial portion of ED MH visits are made by children and adolescents (20%–45%) who are returning after an initial visit (Cloutier et al., 2016; Goldstein, Frosch, Davarya, & Leaf, 2007; Mapelli et al., 2015; Newton et al., 2009). Of the children and adolescents who were frequent visitors, 50 percent came back within one month and 85 percent came back within six months (Peterson et al., 1996; Tossone et al., 2014). Many consider this a problem as return visits contributes to ED overcrowding, requires additional resources, and visits might not be for emergent concerns (Chun et al., 2015; Dolan et al., 2011; Grupp-Phelan et al.,

2007; Mahajan et al., 2009; Mapelli et al., 2015; Newton et al., 2009; Pittsenbarger & Mannix, 2014). However, there is limited knowledge about those who return to the ED and even less is known of the reasons why (Yu, Rosychuk, & Newton, 2011). Looking at pediatric MH ED visits through the lens of health behaviour and developmental research models may be helpful in determining which variables are most important in predicting the decision of youth and families to seek treatment in the ED for MH concerns.

6. Models of Health Behaviour

Health behaviour research seeks to explain how individuals come to make decisions about their health. The greatest challenge is determining why individuals with similar issues and set of circumstances behave differently when seeking health services and why the same individual will arrive at a different health decision on different occasions (Mechanic, 1979). More specifically, it is important to understand what would influence the decision of a family to bring their child to the ED, rather than to other settings, to receive MH care.

The most commonly used and well-known models are the Health Belief Model (HBM), Theory of Planned Behavior (Ajzen, 1991) and Stages of Change (Prochaska, Diclemente, & Norcross, 1992). These models have been used to help explain such decisions as cancer screenings (e.g., Austin, Ahmad, McNally, & Stewart, 2002), vaccination uptake (e.g., Gallagher & Povey, 2006), smoking cessation (e.g., Prochaska, Velicer, Fava, Rossi, & Tsoh, 2001), and medication adherence (e.g., Adams & Scott, 2000). Other models which more specifically aim to explain how individuals decide to access services also exist. For example, one of them, expanded by Fischer, Weiner, and Abramowitz, conceptualizes the behaviour of seeking help and accessing health services as a progression through five consecutive steps (Logan & King, 2001). First, the individual identifies and acknowledges that he or she has a health problem and, second,

the individual will contemplate the options and consequences of seeking help (Logan & King, 2001). The third step is the decision to seek help (Logan & King, 2001). Then, the fourth step consist of experiencing an internal or external event that will mobilize the individual to seek help right away and finally, the last step is the help-seeking behaviour itself (Logan & King, 2001). Although the steps are presented in a linear fashion, it is important to remember that most individuals will move back and forth along this continuum (Logan & King, 2001). This linear model is very similar to Prochaska' Stages of Change (pre-contemplation, contemplation, preparation, action, maintenance, and relapse) which is commonly used in addiction services (Prochaska et al., 1992).

The issue with these classic models of service access is that they cannot be applied directly to youth because of their exclusive focus on the individual (Logan & King, 2001). They do not allow for the contribution of contextual factors, such as the importance of caregivers, school staff and the larger community in accessing health services (Logan & King, 2001). We know that children and adolescents rarely seek and navigate the MH system alone (Logan & King, 2001).

One model that has the potential to be useful in the study of youth MH visits to the emergency room is the Andersen model and its variations. In the 1970s, R. Andersen and J.F. Newman (1973) developed a model which aimed to explain individual health care utilization. The model proposes that societal determinants interact with the health services system to impact individual determinants. Individual determinants then have a direct influence on the type and purpose of health services utilization. Individual determinants can be further broken down into three types of factors: predisposing, enabling, and need factors. Predisposing characteristics are demographic factors (or other individual characteristics) that exist prior to the health problem

and can affect a person's willingness to seek services (Logan & King, 2001). Enabling factors, or service utilization factors, are situational variables (current resources and availability of services) that can act to facilitate or inhibit service-seeking once a person intends to take action (Logan & King, 2001). Finally, need (for services) characteristics are clinical factors that comprise severity of symptoms and the clinical status of the individual (Logan & King, 2001).

Predisposing factors can be further divided up into three categories: demographics (e.g., sex, age), social structure (e.g., education, race, occupation) and beliefs (values, attitudes and beliefs concerning health and health services). Enabling factors can be further divided up into family resources (e.g., income, regular source of care) and community characteristics (e.g., ratio personnel to population, rural vs. urban). Finally, need factors can also be divided in two: perceived (e.g., self-diagnosis, perceived severity) and evaluated (e.g., diagnosis, symptoms evaluated by a health professional). It was found that for access to hospital services, both perceived and evaluated need were strong predictors, demographic and family resources were medium predictor and the rest were weak predictors (Wolinsky, 1978).

More recently, Padgett & Brodsky (1992) proposed a modified version of the Andersen model tailored to presentations to the ED which focuses exclusively on individual determinants (i.e. predisposing, enabling and need factors; see Figure 1). In this model, Padgett & Brodsky (1992) emphasizes the need to consider variables outside the basic demographics to better understand the decision to visit the ED. However, such a model has never been used in the context of pediatric ED visits. Although family influences are not directly addressed in the Padgett & Brodsky (1992) version, family variables could easily be added to this model using a developmental research model, specifically Bronfenbrenner's ecological view of families.

Studies examining adult ED use have generally found that need (clinical) factors

predicted service use the most (Leaf et al., 1988; Mechanic, 1979; Wolinsky, 1978). In a review of evidence, it was found that all the variables of the Andersen model accounted for 16 to 25 percent of physician utilization (Mechanic, 1979). However, need factors were most influential. For example, in a study by Andersen and colleagues, 85 percent of the variance explained was due to need factors (Mechanic, 1979). In another study on predictors of the number of physician visits, the variance explained by nine variables was 22 percent and the variable of ‘symptoms’ yielded a standardized beta of .32 (Mechanic, 1979).

In sum, numerous models have been proposed in order to better understand how individuals choose and navigate health services. The adapted Andersen model by Padgett & Brodsky (1992) has been used to describe how individuals choose to access the ED. However, this model needs to be further adapted to fit the reality of youth and their families. A developmental model will be used to modify Padgett and Brodsky’s model (1992) and this adapted version will be tested. None of the research into MH visits to the ED so far has used a theoretical model to guide their investigation into risk factors.

7. Ecological View of Mental Health and Families

Many factors contribute to the development of childhood mental health concerns, including biological (e.g., genetics, temperament) and environmental (e.g., social interactions, exposure to trauma) factors. Caregivers and families are situated in the microsystem, the child’s immediate environment, and are in a key position to affect the child’s psychosocial development and behaviour (Bronfenbrenner, 1994). For this reason, Bronfenbrenner’s ecological model may be able to inform how youth and their families navigate, use and engage in MH services.

Bronfenbrenner’s (1994) ecological model of human development posits that human growth occurs as a result of the relationship between the individual and the environment. The

theoretical framework also postulates the existence of interrelated and nested subsystems in order to emphasize that proximal processes (enduring forms of interaction in the immediate environment) have the greatest impact on the individual (Bronfenbrenner, 1994). To begin, the microsystem consists of the individual's pattern of activities and relationships in their immediate environment. The most common settings and relationships for children and adolescents are caregivers and family as well as school staff and peers. The second layer, the mesosystem, is comprised of the interactions between microsystems; in other words, the relationship between two or more settings. For example, in this context, the characteristics of the child's home might interact with the child's behaviours with peers at school. The third layer, the exosystem, consists of linkages and processes between two or more settings where the individual is not present. For example, caregiver social networks or employment satisfaction might impact the child's peer group or home life. The fourth layer, the macrosystem, is comprised of characteristics of the individual's culture, such as beliefs systems, lifestyle, and opportunities (i.e., its social blueprint). In this context, it would include MH stigma as well as beliefs towards identification, help-seeking and treatment of mental illnesses. This might also include funding and availability of MH treatment in tertiary, community and primary care. Finally, the last layer, the chronosystem, consists of change or consistency over time in the characteristics of the individual as well as the environment. This influence is harder to characterize, but might include changing personal attitudes or the standing of MH care within the greater health care system.

The factors in Padgett & Brodsky's (1992) can easily be incorporated into the nested subsystems posited by Bronfenbrenner. Predisposing (demographic) factors are characteristics conceptualized as being specific to the individual. Enabling (service utilization) factors may fall in the mesosystem or exosystem as they rely on the interplay between home and health services.

Finally, need (clinical) factors may fall within the microsystem since it captures the relationship between individual child variables and mental health system level variables. As it was previously emphasized, the original Padgett & Brodsky model, which was developed for adults, does not incorporate any family-level predictors. For youth and children, family factors are part of the microsystem since caregivers are one of the most proximal processes during childhood and adolescence. For this reason, the Bronfenbrenner model is used in this thesis to modify the Padgett and Brodsky model.

Family, caregivers and youth can interact in important ways. It is thought that in order for the child to feel safe, learn to interact socially, and self-regulate emotions, caregivers must provide a secure and warm family environment by establishing good parenting practices (Blader, 2004; Fontanella, 2008; Repetti, Taylor, & Seeman, 2002). Research into parenting styles has shown that children of authoritative parents (those who provide control and warmth) experience the best long-term outcomes and are the most likely to become resilient towards future negative life events (Masten, Best, & Garmezy, 1990; DeVore & Ginsburg, 2005). However, as Bronfenbrenner posited, the effect is better described as a bi-directional interaction between child and caregiver. Not only is the child's behaviour affected by family environment and parenting practices, the child also evokes responses from the caregiver and therefore shapes the parent-child relationship, future interactions, and the home environment (Friesen and Koroloff, 1990).

Adverse childhood experiences (ACEs; such as physical and sexual abuse, household dysfunction, marital violence, parental imprisonment) can disrupt a child's MH and lead to long term impairment (Erel & Nurman, 1995; Fergusson, Boden, & Horwood, 2008; Holt, Buckley &

Whelan, 2008; Kitzmann et al., 2003; Weich, Patterson, Shaw & Stewart-Brown, 2009).

Children exposed to family conflict, aggression and violence or who receive unsupportive or neglectful parenting are at risk of developing a wide array of physical and MH problems (Repetti et al., 2002; Taylor, Lerner, Sage, Lehman, & Seeman, 2004). Less severe life events can also adversely impact the MH of children and adolescents. These include, but are not limited to, parental loss of employment, death in the family, frequent home moves, divorce, having a sibling with high medical health needs, bullying, and learning difficulties (Patel, Flisher, Hetrick, & McGorry, 2007).

Negative family environments can exacerbate genetic predispositions to certain disorders and create a cascade of vulnerabilities (Cummings & Valentino, 2015; Repetti et al., 2002). For example, some children may develop social and emotional regulation deficits which put them at risk for a range of high-risk behaviours such as substance abuse, sexual behaviours, or bullying/victimization (Cheetham, Allen, Yücel, & Lubman, 2010; Messman-Moore, Walsh, & DiLillo, 2010; Shields & Cicchetti, 2001). In one study, consequences of inadequate styles of parenting were still apparent during late adolescence and early adulthood even after controlling for parental mental disorders and child temperament (Johnson, Cohen, Kasen, Smailes & Brook, 2001). More generally, dysfunctional parenting has a non-specific impact on the child's MH such that it has been associated with a range of internalizing and externalizing disorders (Berg-Nielsen, Vikan, & Dahl, 2002).

Furthermore, it is common for caregivers to struggle with their own MH difficulties (Wissow, Ginneken, Chandna, & Rahman, 2016). Both parental and child psychopathology has been shown to impact parenting abilities directly (Berg-Nielsen et al., 2002). For example, a

meta-analytic review of maternal depression and parenting behavior showed that mothers who were currently depressed displayed the most negative behaviours, including threatening gestures, negative facial expressions, and intrusiveness (Lovejoy, Graczyk, O'Hare, & Neuman, 2000). Fortunately, there is evidence that successful treatment of parental mental illness is often associated with significant improvements in child psychopathology (Gunlicks & Weissman, 2008). Furthermore, parent training can be an effective treatment since it takes into consideration the needs of the whole family and provides support to caregivers in adapting their parenting practices to diminish problematic behaviours (e.g., Stattin, Enebrink, Ozdemir, & Giannotta, 2015).

Nevertheless, although youth mental illness is more common in dysfunctional families, youth from strong families can also experience mental illness (World Health Organization, 2003). In turn, child mental illness can also negatively impact caregivers and family life. Parents who are caregivers of youth with MH issues often feel ill-equipped and lacking in the necessary knowledge and resources to take on this role (Farmer, Burns, Angold, & Costello, 1997). Child mental illness can disrupt family life, change routines, limit activities, and impact relationships with friends and extended family (Farmer et al., 1997). Caregivers can also experience financial, physical and emotional strain, stigma, parental burden, marital stress and decreased overall well-being (Farmer et al., 1997).

To conclude, it is evident that parents can have a tremendous impact on the development and maintenance of childhood MH disorders through the environment and parenting they provide, but that youth mental illness can also affect a caregiver's ability to parent suggesting a bidirectional relationship. Many researchers agree that a developmental and ecological

standpoint is the key to understanding childhood and adolescent problems (Cummings & Valentino, 2015).

These factors also need to be taken into consideration when families are seeking MH services. In fact, both the Bronfenbrenner and Padgett and Brodsky models incorporate the idea that proximal and distal factors have differential impact on the ability to predict behaviour and explain development. Bronfenbrenner's ecological model can therefore easily be used to modify Padgett and Brodsky's model of ED utilization by adding family characteristics as an additional set of factors that may be associated with the decision to use the ED.

8. The Impact of Family Factors on Health Services Access and Utilization

Unlike most adults, youth greatly depend on their caregivers to access the healthcare system. Even for adolescents, caregivers and other adults are typically central to the process of identifying, seeking and securing health services (Logan & King, 2001). Parents are thought to be the mediators of service access because children and many adolescents depend on parents for knowledge of available resources, transportation, finances, and permission (Farmer et al., 1997). For this reason, family and caregiver have been shown to play an important role in accessing a variety of health and MH care services. This next section defines and reviews some of the most commonly used family constructs in the literature on family factors and service utilization. Such a review is necessary to help drive variable selection and hypotheses concerning the role of family factors in predicting return ED visits.

To begin, family constructs are conceptually related and often correlated. For example, a study looking at families of children with a disorder affecting physical and intellectual development examined the relationship between family functioning, parental coping style and

caregiver burden. Result showed that less adaptive parental coping styles (e.g., palliative coping) were associated with increased caregiver burden; that family functioning mediated the impact of symptoms on the level of perceived burden; and that family functioning and coping styles were better predictors of caregiver depression than burden (Luescher, Dede, Gitten, Fennell, & Mari, 1999). Family functioning is defined as the way a family approaches tasks, roles, and values, communicates and expresses affect, and copes with cultural, environmental, psychosocial, and socioeconomic stresses (Skinner, Steinhauer, & Sitarenios, 2000). Caregiver strain/burden is defined as the “presence of problems, difficulties or undesirable events which affect the psychiatric patient’s significant others” (Platt, 1985). Finally, parental coping style is defined as the behaviors one engages in when faced with a stressful situation in relation to their child(ren) (Pangalila et al., 2017).

Family factors have also been examined in relation to psychiatric rehospitalization. Results from studies suggest that poor family functioning and low parental involvement increase the risk of being readmitted (Blader, 2004; Fontanella, 2008). Another study examined the risk of psychiatric readmission and parenting styles and found that permissive parenting style was associated with higher readmission rates (note that the uninvolved/indifferent style was not included in this study; Fite, Stoppelbein, & Greening, 2009). Parenting style was defined as the number and type of demands made by the parents and the contingency of parental reinforcement (Darling & Steinberg, 1993). The proposed rationale for this finding is that caregivers are thought to be particularly important because of their role in following discharge recommendations and seeking and approving rehospitalization (Bladder, 2004). Some researchers also suggest that family interventions may be particularly important in treating these children and preventing recidivism (Asarnow et al., 1988).

Family factors have also been associated with the use of MH services more broadly. For example, in a study examining 9 to 13 year-olds with psychiatric problems, perceived parental burden emerged as the strongest predictor of the probability of using specialty MH services (Angold et al., 1998). Moreover, when controlling for parental burden, child symptomology had little effect and impairment had none whatsoever on the probability of receiving services (Angold et al., 1998). Perceived parental burden was therefore thought to be a mediator of child symptomology on MH service utilization (Angold et al., 1998). Overall, the more negative the perceived impact by families, the more likely the youth is to receive services (Farmer et al., 1997).

In addition, there is evidence that family characteristics have also been linked to the utilization of health services more broadly. In a study examining predictors of child general health care use, maternal worry about health and mother's prior health visits were significant predictors (Janicke, Finney, & Riley, 2001). Additionally, another study investigated the role of psychosocial factors in asthma rehospitalization in 4 to 18 year olds and found that greater family, personal and financial strain, family conflict, and the sense of mastery in managing their child's asthma was associated with lifetime history of asthma hospitalizations (Chen, Bloomberg, Fisher Jr., & Strunk, 2003). Future hospitalizations however were only predicted by low sense of mastery over their child's asthma and being less emotionally bothered by asthma (Chen et al., 2003). These factors predicted outcomes above and beyond symptom severity, asthma medications use and child age (Chen et al., 2003). Finally, other studies have examined rates of maternal depression and found that, for general pediatric ED visits, severity of depression symptoms was significantly associated with missed pediatric outpatient visits, six-month repeated ED use, and perceived difficulty in taking care of their child (Flynn et al., 2004;

Grupp-Phelan et al., 2003). Therefore even for physical illnesses, utilization of services was associated with parental and family factors.

To conclude, family factors, such as family functioning, caregiver burden/strain, parental coping styles, maternal depression and family conflict, have been shown to impact service access for health and MH services. In this way, families shape how youth will move through the MH care system and can help or hinder youth from accessing services (Brannan, Heflinger, & Foster, 2003). However, the role of family factors in predicting pediatric MH ED visits has yet to be investigated. We know that for 56 percent of youths under 20 years-old visiting the ED for psychiatric concerns, parents were the referral source, while only 3 percent were made by the youths themselves (Grupp-Phelan et al., 2009).

9. The role of Family Factors in Pediatric MH Return Visits to the EDs

The literature on predictors of youth MH service utilization has primarily focused on demographic and clinical characteristics (Brannan et al., 2003). The research on repeat visits is no different: prior parental experience seeking MH care for their child is the only factor related to family characteristics that has been investigated in the literature so far (Leon et al., 2017). Furthermore, it is increasingly recognized that parental resources, effort, perseverance, and involvement are key to youth accessing services (Farmer et al., 1997). Focusing on youth characteristics (demographics, symptomatology) alone is therefore failing to take into account the influence of caregivers (Logan & King, 2001).

Some family characteristics have been demonstrated to influence symptom severity (Angold et al., 1998) and access to a wide range of health and MH services (Blader, 2004; Fontanella, 2008; Chen, Bloomberg, Fisher Jr., & Strunk, 2003; Janicke, Finney & Riley,

2000; Flynn et al., 2004; Grupp-Phelan et al., 2003). It is therefore likely that these constructs might also play an important role in pediatric return visits to the ED.

Psychiatric rehospitalization is of particular interest as it might be the closest service utilization behaviour to return visits in terms of access (many hospitalizations occur from the ED) and symptom severity (admission is crisis-based). It was found that youths who come from poorly functioning families and have low parental involvement are at greater risk of being readmitted (Blader, 2004; Fontanella, 2008). Furthermore, family functioning encompasses characteristics of the family that predate the illness while other constructs (e.g. parental stress) are reactions to the illness (Skinner et al., 2000), which might help ED clinicians identify families at a higher risk regardless of diagnosis or severity of symptoms. Furthermore, measures of family functioning describe the family as a unit by emphasizing family dynamics instead of describing individuals in relation to one another within their family (Skinner et al., 2000). Such a comprehensive view of family dynamics might provide ED clinicians a quick snapshot of the family. I hypothesize that families with poorer family functioning would be more likely to return to the ED because they have a harder time organizing, communicating and problem-solving as a unit, leading to a higher number of crises and therefore a higher likelihood of visiting the ED.

Perceived parental burden is also of special interest as it has emerged as the strongest predictor of the probability of using specialty MH services and was found to mediate the influence of child symptomology on service utilization (Angold et al., 1998). We also know that caregivers of youth with mental illness experience high levels of social, financial, and emotional burden (Farmer et al., 1997). Measures of parental burden therefore capture the

impact and level of strain the illness puts on the caregivers. I hypothesize that a higher level of perceived parental burden would predict repeat ED visits because families might be more overwhelmed and seek to access any available services. Since EDs are open 24/7, they might be the most accessible MH service.

10. Conducting MH Research in the Pediatric ED

There is very limited information on youth mental illnesses in Canada and even less monitoring of this important issue (Health Canada, 2002). Moreover, considering the lack of funding for child and youth MH services, it is not surprising that research in this area is also lagging behind (Stan Kutcher, 2011; Waddell et al., 2005). Specifically, there exists a relative paucity of research on youth MH-related visits to the ED (Yu, Rosychuk, & Newton, 2011). Research into youth MH services in general, as well as those specifically rendered in the ED, is particularly difficult to conduct for the following reasons: (1) issues of research ethics, capacity and consent; (2) nature of the ED and its environment; and (3) MH stigma and the nature of ED visits.

Issues of research ethics, capacity, and consent. In Canada and in the U.S. safeguards exist to protect those considered vulnerable populations (Arnold et al., 1995). Clinical research above minimal risk is therefore held to more stringent criteria than clinical care (Hoop, Smyth & Roberts, 2008). Research in youth MH is particularly scrutinized because it taps into two factors of vulnerability: children and mental illness (Arnold et al., 1995). Both categories are thought to be vulnerable due to their diminished capacity to consent (Arnold et al., 1995). Age of consent and the fluctuating nature of mental illness are topics that are still controversial (Hoop, Smyth & Roberts, 2008). In the past, there has been abuse on the part of researchers and institutions towards vulnerable populations whose human rights were violated and research conducted under

subterfuge or without informed consent (Capron, 1999). However, the undesirable side-effect has been that the increasingly high standards of research in these populations have hampered the progression of research in crucial areas (Arnold et al., 1995). In other words, researchers find it too onerous and complicated to conduct such studies and the field has therefore not advanced as much as it could have (Glickman et al., 2008). In essence, some of these safeguards are discriminating against these vulnerable populations (Arnold et al., 1995).

Nature of the ED and its environment. As with clinical interventions, the nature of the ED environment makes it difficult to conduct research. EDs tend to be busy, noisy and sometimes chaotic (Baren, Mace, Hendry, Dietrich, Goldman, et al., 2008; Chun et al., 2015; Clarke et al., 2007). Although wait times in the ED can be extremely long, finding the appropriate time to approach as well as a private place to properly explain an ongoing study, obtain informed consent and conduct interviews or complete questionnaires can be extremely challenging (Baren, Mace, Hendry, Dietrich, Goldman, et al., 2008; Schmidt et al., 2008). Research measures cannot be easily integrated into existing ED protocols, which are made to be quick and efficient (Schmidt et al., 2008). By extension, using ED professionals to provide those questionnaires can be met with resistance as ED professionals tend to be overworked and have no time to perform non-urgent duties (Schmidt et al., 2008).

MH stigma and the nature of ED visits. Stigma is another barrier to conducting research in the ED. Youth and families who visit the ED might not always be aware that their concerns are MH in nature and might be upset or angered that they are 'labelled' in this way (Clarke et al., 2007). Moreover, the youth and their caregiver might not be as open to discussing research in the ED due to the lack of privacy, perceived stigma at being approached and because they might be too distressed to meaningfully engage in the process (Clarke et al., 2007).

In sum, many barriers to research into child and adolescent MH exist, especially in the ED. Issues surrounding ethics, capacity and informed consent; the nature of the ED and its environment; and MH stigma and the nature of ED visits were discussed. These barriers have probably slowed down the research in this area which is observable in the relatively few number of research articles on this topic and in the variable quality of evidence.

This Thesis

Chapter 1 has provided a detailed overview of the literature on child and adolescent MH, pediatric emergency visits, and the role of family in accessing health/MH services. In summary, mental illness is a national health concern that has historically been neglected, especially in the area of child and adolescent MH. Timely and effective services are therefore crucial to minimize long-lasting consequence of untreated mental illness. However, despite this evident need, many barriers to accessing child and adolescent MH care exist in Canada. The ED has become the safety net of this fragmented MH care system, but even within the ED, many barriers exists in adequately addressing MH concerns. ED visitors are thought to be mostly female, adolescent, and present with comorbid disorder or suicidality. Although they account for 20 to 45 percent of all visits, even less is known of repeat ED visitors. A paucity of research in this area as well as a lack of theoretical framework undermines our understanding of why patients chose to visit and re-visit the ED. One model of health behaviour, Padgett & Brodsky, seems to be an appropriate theoretical framework for investigations into risk factors associated with repeat visits; however this model does not take into consideration the uniqueness of children and adolescents, who often rely on their parents to access MH services. Bronfenbrenner's ecological model can be used to modify the Padgett & Brodsky model to include family factors. It is known that caregivers, who are in the child's microsystem, are in a key position to affect the psychosocial

development and the decision to seek help. In fact family factors —such as family functioning, caregiver burden/strain, parental coping styles, maternal depression and family conflict— have been shown to impact service access for health and MH services. Finally, conducting MH research with youth and families in the ED has its own unique challenges which need to be considered in the design of any future studies.

From this overview, three significant gaps in our current understanding of repeat pediatric MH visitors to the ED can be identified: (1) there exists no review or critical analysis of the literature in this area to orient future research; (2) none of the previous studies has used a theoretical model to drive hypotheses and variable selection; and (3) none of the previous studies has considered the role of family/caregivers. The literature suggests that family/caregivers play key roles in the development and maintenance of MH concerns and in helping or hindering access to health and MH services.

Therefore, the primary objectives of this thesis are to systematically review the existing literature on youth repeat MH return visits to the ED (Study I) and determine if family variables (specifically: family functioning, perceived burden and caregiver history of treatment for MH concerns) can predict repeat visits (Study II). The dissertation also aims to use the Bronfenbrenner model to modify the Padgett & Brodsky (1992) model and used this adapted version as its theoretical framework.

Study I

Study I aims to answer the following research questions:

- Which variables have been most strongly associated with repeat ED visits for MH concerns?

- Which family variables have been investigated (if any) and have they been able to predict pediatric repeat ED visits?
- What are limitations of the current literature?

It was hypothesized that:

- Clinical factors (such as suicidality and mood at the index visit) would be most predictive of repeat ED visits for MH concerns.
- Family factors would have not been investigated in prior studies
- Past studies would all have used retrospective cohort designs

Study II

Study II aims to answer the following research questions:

- Which variables are most strongly associated with repeat ED visits for MH concerns in this cohort?
- Are the three family variables (family functioning, perceived burden and caregiver history of mental health treatment) independently associated with repeat ED visits for MH concerns after controlling for demographic, clinical and service utilization factors?
- Do family variables improve model prediction of repeat ED visits for MH concerns, up and above demographic, clinical, and service utilization factors?

It was hypothesized that:

- Family factors (as opposed to demographic, clinical or service utilization factors) would be most strongly associated with repeat ED visits.
- Older age (adolescent); female gender; involvement with a child welfare agency; suicidality at the index visit; mood disorder at the index visit; substance abuse disorder at the index visit; psychotic disorder at the index visit; past or current involvement in mental

health care; poor family functioning; and greater perceived burden variables would be significantly and independently associated with repeat ED visits.

Finally, this thesis also hopes to inform future research into repeat visits to the ED for MH concerns in children and adolescents. Results could be clinically useful and provide information to relevant to ED professionals and ED decision makers on how to better manage and address the needs of this population.

Chapter 2: Study I - Systematic Review

Chapter 2 outlines the objective, methodology, results and conclusions of Study I, a systematic review of the literature on predictors of pediatric ED visits for MH concerns. This manuscript was written in a peer-review journal article format and was published in the Journal of Hospital Pediatrics in March 2017.

Abstract

OBJECTIVES: Repeat visits represent up to 45percent of mental health (MH) presentations to emergency departments (EDs) and are associated with higher health care costs. We aimed to synthesize available literature on predictors of pediatric MH repeat ED visits and differences between repeat visitors and non-repeat visitors.

METHODS: A systematic review was performed using PsycINFO, PubMed, and CINAHL databases. Reporting followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement checklist. Methodologic quality was assessed using the following eight criteria: design, generalizability, breadth of predictors, reporting of effect sizes, additional outcomes, interaction terms, confounding variables, and clear definition of outcome.

RESULTS: A total of 178 articles were retrieved; 11 articles met inclusion criteria. Quality assessment revealed that all studies used chart review or administrative data. Predictors were grouped into three categories: demographic, clinical, and MH care access and utilization factors. Common predictors associated with repeat ED MH visits included socioeconomic status, involvement with child protective services, and previous and current MH service use. For studies using a six-month repeat window, the most common factors were previous psychiatric hospitalization and currently receiving MH services. Heterogeneity in statistical analyses and determinants explored precluded the use of meta-analysis.

CONCLUSIONS: Findings revealed that repeat visits to the ED for MH concerns is a complex phenomenon that can be attributed to various demographic, clinical, and MH care access and utilization factors. To further elucidate the strongest predictors, future prospective research should consider prospective designs and include family factors. Investigating recency and frequency outcomes can also inform clinical practice.

Background

The emergency department (ED) plays a critical role in the care of children and adolescents with mental health (MH) concerns (Dolan, Fein, & The Committee on Pediatric Emergency Medicine, 2011). There has been a noticeable increase in the number and proportion of pediatric ED presentations for MH problems in Canada and the United States, primarily attributable to patients without an emergent presentation (Chun, Katz, Duffy, & Gerson, 2015; Grupp-Phelan et al., 2007; Mahajan et al., 2009; Mapelli, Black, & Doan, 2015; Newton et al., 2009; Pittsenbarger & Mannix, 2014). This increase may reflect unmet MH needs and barriers to accessing MH services in the community (Dolan et al., 2011). For many children and families in crisis, EDs are often the first point of contact with the MH care system because they are always accessible and do not require an appointment or referral (Newton et al., 2010). Furthermore, evidence suggests that some families access emergency services before contacting their primary care physician (Dolan et al., 2011).

MH presentations can be unique in their level of complexity and most EDs are not as well equipped to deal with complex MH visits compared with other medical presentations (Clarke, Dusome, & Hughes, 2007). There is little consensus as to which protocols or models are required to best serve MH disorders within the ED (Janssens, Hayen, Walraven, Leys, & Deboutte, 2013; Leon et al., 2013). There is also a lack of clear standards for assessments, treatments, clinical

tools, and MH training for ED physicians (Cappelli et al., 2012; Chun et al., 2015). Effective management and appropriate detailed discharge plans, whether inpatient or outpatient, are important for reducing symptom worsening and recurrent use of the ED (Cappelli et al., 2012).

A substantial portion of ED MH visits made by children and adolescents (20%–45%) are return visits (Cloutier et al., 2016; Newton et al., 2009), possibly suggesting that patients' needs are not being met after discharge, even though outpatient providers are often accessed (Frosch, dosReis, & Maloney, 2011). Within overloaded EDs, repeat visits are a significant economic and resource burden (Frosch et al., 2011). Patients who revisit the ED within a short time (less than six months) incur the highest MH care costs (Frosch et al., 2011). Therefore, a strong understanding of which MH patients are at risk for becoming a repeat ED visitor is needed to develop targeted interdisciplinary care management plans (Pines et al., 2011).

To address this issue, the primary objective of this study was to systematically review the literature for predictors of pediatric MH repeat ED visits and differences between repeat visitors and non-repeat visitors.

Methods

Data Sources

A systematic review of the literature was performed using PsycINFO, PubMed, and CINAHL databases. Search terms were related to children and adolescents, EDs, return visits, and psychiatric disorders. The reference lists of identified and related articles were screened to find potential additional publications. The initial search was conducted in November 2014 and was updated in January 2016. The protocol was developed a priori and reporting follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement checklist (Moher, Liberati, Tetzlaff, Altman, & the PRISMA Group, 2010). Medical librarians at

the Children's Hospital of Eastern Ontario provided guidance into the search strategy, ratings of methodological quality, and reporting guidelines.

Study Selection

The search was restricted to observational cohort studies published in English after 1980. Earlier studies were not included because the many changes to the MH care system and categorization of MH disorders have likely rendered them less relevant. Studies were included if the population of interest was youth 0 to 18 years of age and if the outcome analyzed was repeat pediatric presentations to the ED for MH concerns. Studies were excluded if (1) their sample included adults (>18 years of age), (2) the visits were made for non-MH reasons, (3) the outcome was a repeat suicide attempt, (4) the outcome was a repeat visit specific to a particular presenting problem (e.g., self-harm, drug or alcohol abuse) as these studies overlooked other MH ED presentations that might have occurred during the study period, or (5) the outcome was a psychiatric rehospitalization since the characteristics and experiences of patients readmitted to an inpatient unit might differ from visitors who were not. Factors associated with psychiatric rehospitalization have been reviewed elsewhere (Blader, 2004; Fontanella, 2008),

Data Extraction

Two reviewers independently screened titles, abstracts, and full texts and then extracted data from included studies. Any disagreements not resolved through consensus required consultation with a co-author. Data were extracted by using a standardized form, which included study and population characteristics, predictive variables, and results. In four instances, primary authors of included and eligible studies were contacted to clarify uncertain or unreported information. The same two reviewers independently rated all included articles on 8 criteria to assess methodologic quality. This study was registered with the International Prospective

Register of Systematic Reviews (CRD42016032329).

Results

The search identified a total of 176 articles: 21 from PsycINFO, 130 from PubMed, and 25 from CINAHL. Nine studies met all inclusion criteria (Ballard et al., 2013; Cole, Turgay, & Mouldey, 1991; Frosch et al., 2011; Gipson, Agarwala, Opperman, Horwitz, & King, 2015; Goldstein, Frosch, Davarya, & Leaf, 2007; Newton et al., 2010, 2012; Newton, Rosychuk, Niu, Radomski, & Mcgrath, 2015; Sobolewski, Richey, Kowatch, & Grupp-Phelan, 2013). Two additional studies also met inclusion criteria and were identified through references (Boyer et al., 2013) and our own work (Cloutier et al., 2016). See Figure 2 for the flow diagram.

Characteristics of included studies can be found in Table 1. Heterogeneity in reported statistical analyses, determinants explored, and the small number of studies meeting inclusion criteria precluded the use of meta-analyses to pool and interpretation of study results. Thus, a narrative and graphical synthesis of review findings is presented and grouped by study variables.

Demographic factors examined in the literature were age, biological sex, indicators of socioeconomic status, race/ethnicity, and involvement with child protective services. Nine studies considered age (Cole et al., 1991; Frosch et al., 2011; Gipson et al., 2015; Goldstein et al., 2007; Newton et al., 2010, 2012, 2015; Sobolewski et al., 2013); however, the use of different age ranges and comparison groups might account for the mixed findings. Nevertheless, there appears to be a trend toward older youth being at higher risk of returning to the ED. Similarly, 10 studies examined the influence of biological sex (Cloutier et al., 2016; Cole et al., 1991; Frosch et al., 2011; Goldstein et al., 2007; Newton et al., 2010, 2012, 2015) and found mostly nonsignificant results, although there is some evidence to suggest girls have a higher likelihood of repeating. Seven studies examined various indicators of socioeconomic status; for

example, governmental assistance and insurance status (Ballard et al., 2013; Frosch et al., 2011; Goldstein et al., 2007; Newton et al., 2010, 2012, 2015; Sobolewski et al., 2013). Results suggest that lower socioeconomic status may be a significant predictor of return visits. Six studies also considered race/ethnicity (Ballard et al., 2013; Frosch et al., 2011; Goldstein et al., 2007; Newton et al., 2012, 2015; Sobolewski et al., 2013) and four of them found that minority status increased return visits, which might be linked to cultural and/or socioeconomic differences in MH-seeking behaviors. Finally, involvement with child protective services was a significant determinant in three out of four studies (Ballard et al., 2013; Cloutier et al., 2016; Goldstein et al., 2007).

Clinical factors examined were suicidal ideation, intentional self-harm psychiatric and developmental diagnoses, symptom severity, and taking psychotropic medications at the time of the index visit. Seven studies considered suicidal ideation, self-harm, and/or suicide attempts and found mixed results (Ballard et al., 2013; Cloutier et al., 2016; Cole et al., 1991; Gipson et al., 2015; Goldstein et al., 2007; Newton et al., 2010; Sobolewski et al., 2013). There appears to be a trend toward a higher likelihood of repeating when suicidal ideation and self-harm behaviors were of greater intensity and duration (Gipson et al., 2015). Previous suicide attempt was not a predictor in one study (Goldstein et al., 2007), but a suicide attempt at the index visit became a predictor in another when other variables were taken into consideration (Sobolewski et al., 2013). Only one study examined homicidal thoughts and found it to be associated with repeat visits (Cole et al., 1991). Psychiatric diagnoses included in the analyses varied greatly between studies. A few psychiatric diagnoses were associated with repeat visits: mood and affective disorders (Cloutier et al., 2016; Newton et al., 2010) psychotic disorders including schizophrenia (Boyer et al., 2013; Newton et al., 2010), and behavior or personality disorders (Boyer et al., 2013; Goldstein et al., 2007). There were mixed results when considering presentations related to

alcohol and other substance use/ abuse, as one study found that it increased likelihood (Boyer et al., 2013), another found that it decreased likelihood (Newton et al., 2010), and yet another found no association with repeat visits (Cloutier et al., 2016). Patients with dual diagnoses (defined by a co-occurrence of a mental disorder and a substance-related disorder) were at an increased likelihood of repeating (Boyer et al., 2013). Two studies looking at triage level found no association with repeat visits for high severity and a decreased likelihood of presenting for low severity (Newton et al., 2010, 2015). Nevertheless, there was a trend toward increased presentations when severity was measured by psychiatric comorbidity (Goldstein et al., 2007; Newton et al., 2015). On the other hand, having a medical comorbidity appeared to decrease return visits (Newton et al., 2015). Finally, one study determined that children and adolescents currently taking psychotropic medication were more likely to return to the ED (Cloutier et al., 2016).

The most common MH care access and utilization factors examined were receipt of MH services, disposition at the time of the presentation, previous psychiatric hospitalizations, and hospital characteristics. Results suggest a strong association between past and/or current MH services and repeat visits (Cloutier et al., 2016; Frosch et al., 2011; Goldstein et al., 2007; Newton et al., 2015; Sobolewski et al., 2013). Only one study found that it reduced repeat visits (Cole et al., 1991). One study took a more in-depth look at how patients accessed discharge recommendations and found that having a physician follow-up visit for MH; having more than one follow-up visit; seeing a physician other than a general practitioner, pediatrician, or psychiatrist; and seeing a physician in a hospital outpatient clinic increased their likelihood of revisiting the ED (Newton et al., 2015). Four studies found that children and adolescents with a history of psychiatric hospitalization were more likely to return to the ED (Cloutier et al., 2016;

Frosch et al., 2011; Goldstein et al., 2007; Sobolewski et al., 2013). Three studies observed that living close to the hospital (city residents) compared with those living farther away was significantly associated with repeat visits (Cloutier et al., 2016; Frosch et al., 2011; Goldstein et al., 2007). One study determined that those presenting to general hospitals (compared to pediatric hospitals) were more likely to have return visits (Newton et al., 2010). Finally, in terms of time of ED presentation, nighttime visits (5 PM–9 AM) were more common in repeat visitors compared with daytime visits (9 AM–5 PM; Cole et al., 1991). Only one study looked at a family-level factor (Sobolewski et al., 2013) and determined that previous parental experience seeking MH care for their child was significantly associated with repeat visits. A visual summary of contributing factors can be found in the provided forest plots. Adjusted odds ratios (ORs), hazard ratios (HRs), and relative risk (RRs) of repeat visits are found in Figures 3-5. Unadjusted ORs, unadjusted HRs, and chi-squares converted into ORs (calculated ORs) are found in Figures 6-8. It should be noted that many studies did not report non-significant statistics, particularly in the adjusted and RR/HR models. Furthermore, a very limited number of statistics were not adequate for plotting and are solely described in the narrative synthesis.

Risk of Bias Assessment. Two reviewers rated the quality of included studies based on a modified version of the Newcastle Ottawa Scale for Cohort Studies criteria:

(1) *Design.* All studies relied on medical chart reviews or administrative databases. This introduces methodological limitations because chart reviews have been demonstrated to be less reliable (Gilbert, Lowenstein, Koziol-McClain, Barta, & Steiner, 1996), especially for MH information (Cappelli et al., 2012). Only one study relied on both chart review and data collected prospectively (Sobolewski et al., 2013).

(2) *Generalizability across EDs.* Samples were somewhat representative, as

current results reflect seven geographical regions. Four were US urban centers, including Baltimore (John Hopkins Hospital, Maryland; Frosch et al., 2011; Goldstein et al., 2007) Washington, D.C. (Children's National Medical Center; Ballard et al., 2013) Cincinnati (Cincinnati Children's Hospital Medical Center, Ohio; Sobolewski et al., 2013), and Ann Arbor (University of Michigan Hospital, Michigan; Gipson et al., 2015). Two regions were represented in Canada: the greater Ottawa area (Children's Hospital of Eastern Ontario, Ontario; Cloutier et al., 2016; Cole et al., 1991) and the province of Alberta (Newton et al., 2010, 2012, 2015). One region was represented in France (Hôpitaux de Marseille, Bouches-du-Rhône; Boyer et al., 2013). Most studies included patients accessing one or two medical centers (Boyer et al., 2013; Cloutier et al., 2016; Cole et al., 1991; Frosch et al., 2011; Gipson et al., 2015; Goldstein et al., 2007; Sobolewski et al., 2013) whereas three studies included a provincial registry database of 96 to 104 medical centers (Newton et al., 2010, 2012, 2015). Research integrating data from multiple ED sites provides stronger evidence, as families might have accessed other EDs. However, we noted an overlap in the participant samples of the three studies that used registries from the province of Alberta (Newton et al., 2010, 2012, 2015) and an overlap in the samples of the two studies from Baltimore city (Frosch et al., 2011; Goldstein et al., 2007) limiting generalizability as findings might be inflated by sample specific variation. Finally, two studies examined samples composed of specific MH presentations (suicidal behaviors (Sobolewski et al., 2013), anxiety and stress-related disorders (Newton et al., 2015)), making the predictors in these studies less relevant for predicting return visits for other MH presentations.

(3) *Breadth of predictors.* All included studies explored demographic and clinical

factors. All but one study (Boyer et al., 2013) examined MH care access and utilization predictors. Family predictors were considered in one study only (Sobolewski et al., 2013).

(4) *Measure of effect sizes.* For articles using χ^2 statistics, the strength of association was not reported (Cole et al., 1991; Frosch et al., 2011; Gipson et al., 2015; Goldstein et al., 2007; Sobolewski et al., 2013).

(5) *Additional outcomes.* Four studies examined recency (Cloutier et al., 2016; Newton et al., 2010, 2012, 2015) whereas only one study looked at both recency and frequency of repeat visits (Cloutier et al., 2016).

(6) *Interaction terms.* Three studies explored how factors might interact in their analyses (Goldstein et al., 2007; Newton et al., 2010, 2015).

(7) *Confounding variables.* Four studies controlled for other variables in their models (Cloutier et al., 2016; Goldstein et al., 2007; Newton et al., 2010, 2015). Two used a washout period to ascertain the index visit (Cloutier et al., 2016; Goldstein et al., 2007). Based on a sensitivity analysis, a third study reported minimal impact on the results whether a washout period was used or not (Newton et al., 2010). Three of the studies with longer follow-up periods controlled for time-to-repeat in their analyses (Cloutier et al., 2016; Newton et al., 2010, 2012). This is important for decreasing the risk of bias, as some participants might have either turned 18 during the study period or had less time to repeat if their index visit was near the end of the study period.

(8) *Clear definition of outcome.* None of the studies clearly defined what was meant by a repeat visit. In fact, repeat visit windows ranged from two months to six years, which limits our ability to draw firm conclusions from between study differences.

Discussion

This is the first published systematic review looking at predictors of pediatric MH repeat ED visits. This review uncovered 11 studies investigating predictors of repeat MH visits, repeat visit recency, and/or repeat visit frequency. Findings revealed that repeat visits to the ED for MH concerns is a complex phenomenon that can be attributed to various demographic, clinical, and MH care access and utilization factors. Although these factors do not provide information on reasons behind return visits, they can provide insights into the characteristics of patients most likely to come back. It has been hypothesized that repeat MH visits are either a product of clinical factors (i.e., worsening of symptoms) or MH care access and utilization factors (e.g., difficulty accessing MH services for financial, availability, or other reasons). This systematic review suggests that traditional measures of clinical severity in the ED are not reliable indicators of future repeat visits. In fact, triage level showed either no association with repeat visits (Goldstein et al., 2007) or that lesser severity of symptoms was associated with return visits (Newton et al., 2010) matching reported increases in non-emergent presentations (Baren et al., 2008; Chun et al., 2015; Grupp-Phelan et al., 2007; Mahajan et al., 2009; Mapelli et al., 2015; Newton et al., 2009; Pittsenbarger & Mannix, 2014).

Moreover, clinical severity also was not found to significantly change across repeat visits (Yu, Rosychuk, & Newton, 2011), indicating that traditional measures of severity based on triage may be less appropriate for predicting return pediatric MH visits or that children and their families are coming back because they are unable to access other MH services. Yet, findings from this review also showed that those currently receiving MH services had an increased likelihood of repeated ED visits (Frosch et al., 2011; Goldstein et al., 2007; Sobolewski et al., 2013). Currently receiving professional resources also significantly predicted recency (Cloutier

et al., 2016; Newton et al., 2015) and frequency (Cloutier et al., 2016) of visits. Therefore, results may indicate that recent and repeated experience with the MH care system facilitate further MH-seeking behaviors, possibly because of greater knowledge, familiarity, and self-efficacy when facing the complexities of the MH care system. However, it is important to note that identifying whether the patient is currently receiving MH treatment does not give any indication as to the appropriateness of the services received or the level of the patient's engagement/compliance with treatment. Two studies looked at the level of compliance with treatment and found conflicting results. Compliance was associated with decreased likelihood of repeat visits in one study (Cole et al., 1991), whereas findings from another indicated that youth who were resistant or noncompliant were less likely to repeat or to repeat more frequently (Cloutier et al., 2016). Taken together, ED clinicians should consider indicators of clinical severity other than traditional ones, such as the presence of comorbid MH disorders (Boyer et al., 2013; Goldstein et al., 2007). It would also be important for ED clinicians to consider the appropriateness and compliance with current MH outpatient services in determining whether further referrals or supports are needed before discharge.

Next, we examined predictors identified in studies with a six-month repeat window (Frosch et al., 2011; Goldstein et al., 2007; Newton et al., 2015; Sobolewski et al., 2013) because it has been shown that 50 percent of psychiatric repeat visits occur within a month and 85 percent within six months of the index ED visit (Goldstein et al., 2007). It appeared that MH care access and utilization factors (currently receiving MH services and previous psychiatric hospitalization) were the strongest predictors of short-term repeat visits (Frosch et al., 2011; Goldstein et al., 2007; Sobolewski et al., 2013). Analysis of recency of repeat visits also highlighted that these variables were important in earlier return visits (Cloutier et al., 2016;

Newton et al., 2015), which suggests that patients who repeat within a shorter time might be characterized as high service users who treat the ED as part of their MH care continuum.

Comparing predictors of earlier versus later return visits might therefore be another important step in understanding how pediatric patients use the ED.

In addition, it has been suggested that to decrease families' reliance on the ED for MH concerns, EDs should implement a multidisciplinary approach, validated pediatric MH screening tools, pediatric trained MH consultants, and enhanced collaboration with primary care and outpatient MH services (American Academy of Pediatrics & American College of Emergency Physicians, 2006). Having professionals trained in pediatric MH care who work as a multidisciplinary team is desirable because they are better equipped to attend to social determinants, such as socioeconomic status, cultural factors, and involvement with child protection services, which have been shown to increase likelihood of repeat visits (Ballard et al., 2013; Cloutier et al., 2016; Cole et al., 1991; Frosch et al., 2011; Goldstein et al., 2007; Newton et al., 2010, 2012, 2015). This review also highlights the importance of MH care utilization factors, therefore multidisciplinary teams who can comprehensively assess, collaborate with the patient's other providers, and advocate for patient needs might be key in reducing overuse of the ED. Furthermore, it would be important to develop memorandums of understanding with community partners, such as child protective services to establish standardized comprehensive interdisciplinary care management plans for these at-risk children and youth. Despite this evidence, current management practices in EDs continue to vary widely and there have been few evaluations of which models work best (Cappelli et al., 2012; Chun et al., 2015; Clarke et al., 2007; Janssens et al., 2013; Leon et al., 2013).

Future Directions

Important patient-level and family-level predictors of repeat visits may have been missing in the present literature due to the limitations of retrospective designs based on chart reviews and administrative databases. In studies in which model goodness-of-fit was provided (Goldstein et al., 2007; Newton et al., 2010) results suggested that other variables not captured in charts or databases may have significant predictive ability. The pediatric population is unique in its dependence on caregivers to access services, and therefore family determinants should not be overlooked. Constructs such as family functioning, caregiver burden, parental stress, and parenting styles and coping strategies have been found to play a role in accessing a variety of other health and MH care services (Angold et al., 1998; Blader, 2004; Brannan, Heflinger, & Foster, 2003; Fite, Stoppelbein, & Greening, 2009; Fontanella, 2008). In this review, only one such variable was examined, prior parental experience seeking MH care for their child, and found to be associated with repeat visits (Sobolewski et al., 2013). Furthermore, the adoption of family-centered care in some EDs also underlines the recognition of the transactional nature between the child and family environment not only on the progression of MH issues, but also on access to MH services such as the ED (O'Malley, Brown, & Krug, 2008). Similarly, a greater exploration of interaction terms might not only inform research, but also can be useful for decision-making. For example, in Goldstein and colleagues (2007) patients who presented with disruptive behavior and were admitted at the index visit had a lower likelihood of repeating to the ED than those discharged from the hospital.

Limitations

The current state of the literature is limited by the lack of consensus among the included studies on the operational definition of a repeat visit. The concept of the repeat visit is ill defined

in terms of the time window between the index visit and the return visit. Some researchers have considered any visit within a few years' time a repeat visit (Boyer et al., 2013; Cloutier et al., 2016; Newton et al., 2010) whereas others have considered a shorter period, such as 18 months (Cole et al., 1991), 12 months (Ballard et al., 2013; Gipson et al., 2015; Newton et al., 2012) six months (Frosch et al., 2011; Goldstein et al., 2007), three months (Newton et al., 2015), or two months (Sobolewski et al., 2013). In comparison, the medical ED visit literature is more concerned with the number of repeat visits and defines frequent ED use as two to 20 visits per year (Lacalle & Rabin, 2010; Pines et al., 2011). However, as with the MH repeat ED literature, few studies have explored the number, return window, or pattern at which striking differences in resources, demographics, or clinical factors are observed (Lacalle & Rabin, 2010; Pines et al., 2011). Furthermore, it is unclear whether a repeat visit should be defined as a visit after an index visit during which the presenting symptoms were the same. The difficulty of ascertaining this lies in the lack of reliable charting and in the nature and classification of MH symptoms. For example, a child might originally present with depressive symptoms and a few months later with mainly anxiety symptoms, although both might be rooted in the same overall clinical picture. Two of the included studies have attempted to address this issue (Frosch et al., 2011; Newton et al., 2010) and one posited that visits within a shorter time span might be more similar in their presentation (Frosch et al., 2011).

Conclusion

This article extends the pediatric MH ED literature in three important ways. First, our research provides an in-depth review of available evidence on repeat visitor characteristics, predictors of repeat visits, and also predictors of the recency and frequency of repeat visits, two new emerging outcomes. Second, we identified factors that might provide additional information

for clinical decision-making and help develop optimal clinical management for MH visits. Third, we recommend that future research studies define what they consider a repeat visit (specifying and providing a rationale for recency, frequency, return-window, and washout-period decisions), report determinants in categories that are meaningful and relevant, such as the ones used in this review (demographic, clinical, MH care access, and utilization factors), and use prospective designs, not solely reliant on medical records, to elicit a greater breadth of information on factors and motivations behind return visits. Finally, as is the case with adult repeat ED visitors, establishing the strongest determinants of return visits is necessary to develop a successful way of identifying those at risk for repeat ED visits and to reduce nonemergent visits (Doupe et al., 2012). This is of importance presently, as some EDs have started to develop and evaluate new MH clinical pathways between EDs and community MH agencies to streamline pediatric MH care (ClinicalTrials.gov, 2016), which include standardized comprehensive interdisciplinary care management plans for children and youth (Provincial Council for Maternal and Child Health, 2013).

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Chapter 3: Study II – Retrospective Cohort Study

Chapter 3 outlines the objective, methodology, results and conclusions of Study II, a retrospective cohort study of repeat MH ED visits to a tertiary pediatric hospital. This manuscript was written in a peer-review journal article format and was submitted for publication.

Abstract

OBJECTIVES: Approximately 45 percent of youth presenting to the emergency department (ED) for mental health (MH) concerns will have a repeat ED visit. Since youth greatly depend on their caregivers to access MH services, the objective of this study was to determine if family characteristics were associated with repeat ED visits. **METHODS:** A retrospective cohort study of youth aged six to 18 years treated at a tertiary pediatric ED for a discharge diagnosis related to MH was conducted. Data were gathered from medical records, telephone interviews, and questionnaires. Family factor contribution was analyzed using a multivariable logistic regression model controlling for demographic, clinical and service utilization factors. Variables associated with earlier and more frequent visits were determined using cox regression and negative binomial regression. **RESULTS:** Of 266 participants, 70 (26%) had a repeat visit. Receiving MH services (adjusted odds ratio [aOR]=2.45; 95% Confidence Interval [CI] 1.05-5.68), prior psychiatric hospitalization (aOR=2.90; 95%CI 1.00-8.36), higher severity of symptoms (aOR=1.29; 95%CI 1.08-1.53), and living closer to the hospital (aOR=5.97; 95%CI 1.63-21.85) increased the odds of repeat visits. Caregiver history of MH treatment (aOR=0.27; 95%CI 0.14-0.54) decreased the odds of having a repeat visit. Family functioning and perceived family burden were not associated with repeat ED visits. **CONCLUSIONS:** This study is the first to examine the contribution of multiple family factors in predicting repeat MH visits to the ED. Results suggest caregiver characteristics may impact the decision to return. Healthcare providers

may want to consider caregiver and youth service utilization factors to inform patient management and discharge planning.

Background

Pediatric emergency departments (EDs) play a critical role in the care of youth with mental health (MH) concerns. Although only 4 to 7 percent of hospital emergency visits pertain to MH issues, up to 45 percent of youth MH presentations are repeat visits (Cloutier et al., 2016; Mapelli, Black & Doan, 2015; Newton et al., 2009). Of the children and adolescents who were repeat visitors, 50 percent came back to the ED within one month (Christodulu et al., 2002; Goldstein et al., 2007; Peterson et al., 1996; Tossone et al., 2014) and 65 to 85 percent come back within six months (Newton et al., 2010; Peterson et al., 1996). Return visits for MH concerns contribute to ED overcrowding, require additional resources, and might not be for emergent concerns (Black & Doan, 2015; Chun et al., 2015; Dolan and Fein, 2011; Grupp-Phelan et al., 2007; Mahajan et al. 2009; Mapelli, Newton et al., 2009; Pittsenbarger & Mannix, 2014).

Unlike adults, youth greatly depend on their caregivers to access MH services as they are usually central to the process of identifying, seeking and securing MH services (Logan & King, 2001). When presenting to the ED, 56 to 62 percent of youth are accompanied by a caregiver (Cloutier et al., 2010; Grupp-Phelan et al., 2009). Research into health and MH service utilization has shown that family factors —such as family functioning, caregiver burden/strain, parental coping styles, maternal depression, and family conflict— can help or hinder youth from accessing services (Angold et al., 1998; Blader, 2004; Brannan, Heflinger, & Foster, 2003; Fite, Stoppelbein, & Greening, 2009; Fontanella, 2008). However, current literature examining factors

associated with pediatric repeat ED visits for MH concerns has primarily focused on demographic, clinical and service utilization characteristics and has not considered the influence of caregivers and family (Leon et al., 2017).

In a recent systematic review, common significant predictors of repeat MH visits to the ED in youth included: socioeconomic status, involvement with child protective services, and previous and current MH service use (Leon et al., 2017). However, existing research is limited by retrospective designs solely reliant on medical records and administrative databases and a dearth of information on family-level predictors (Leon et al., 2017). The primary objective of this study was to determine whether family factors were independently associated with repeat ED visits for MH concerns after controlling for demographic, clinical and service utilization factors. Secondary objectives were to identify differences between repeaters and non-repeaters and determine factors associated with earlier and more frequent ED visits.

Methods

Setting

The Children's Hospital of Eastern Ontario (CHEO) is a pediatric tertiary care teaching hospital affiliated with the University of Ottawa. It is located in Canada's capital region of Ottawa and serves metropolitan Ottawa as well as other urban and rural regions of the Eastern Ontario Champlain Local Health Integration Network. The hospital's ED has a total annual volume of approximately 70,000 patient visits for the population under 18 years old, 4.5 percent of which are MH visits. The crisis intervention program is located within the ED and responds to MH emergencies of children and adolescents daily between the hours of 7:30 A.M. and 11:00 P.M. Outside these hours and during peak times, emergency physicians assess and treat patients

with MH complaints. Residents and emergency physicians are typically the first to assess patients with a MH complaint combined with an accompanying medical concern (e.g., drug ingestion, self-inflicted wound), psychosis, or with an application for psychiatric assessment. Emergency physicians can also request a consultation from an on-call pediatric psychiatrist. See Figure 9 for an overview of the MH services in the Ottawa area (CHEO, 2015).

Participants

We conducted a medical record review of all youth aged six to 18 years who presented to the CHEO's ED with MH complaints between April 2014 and April 2015. Study eligibility was assessed based on age and primary discharge diagnosis. The following ICD-10-CM diagnosis codes related to mental and behavioural disorders were included: psychoactive substance use (F10-19), schizophrenia and delusional (F20-29); mood and affective (F30-39); neurotic, stress-related and somatoform (F40-45, 48); syndromes associated with physiological and physical factors (F50-55, 59); other disorders with onset usually occurring in childhood and adolescence (F90-94, 98, 99); intentional self-harm (X71-82) and codes related to non-specific mental health symptoms (R45-46). The first visit made by a youth during the study period was labeled "index visit" and all following visits were labeled "repeat visits". Youth who revisited the ED within six months following the index visit were labeled "repeaters"; those who did not were labeled "non-repeaters" (Leon et al., 2017). Visits occurring after six months following the index visit were not counted as repeat visits.

Exclusion criteria. Youth were excluded if: (1) they had a history of a MH diagnosis but sought ED services strictly for medical reasons (e.g., fever or asthma), (2) they presented with an unclear ED visit (e.g. secondary non-MH medical diagnosis, diagnosis containing "possible" or

“query”) that occurred after February 2015, as per the CHEO Research Ethics Board requirement, (3) they needed inpatient hospitalization for their MH condition, since the needs and experiences of patients discharged from inpatient units might differ and have been investigated elsewhere (Blader, 2004; Fontanella, 2008), (4) they visited the ED six months prior to their index visit; this controlled for additional visits made prior to the beginning of the study period., (5) lived outside of province, (6) the primary respondent was not English- or French-speaking.

Study Design and Ethics

The study cohort was retrospectively identified at six months following an index ED visit. Eligible youth and their caregivers were asked to provide consent to be contacted for research by ED volunteers. Only those who provided consent were contacted by researchers and could choose to participate or not in this study. Data were collected from all participating youth through medical record review, telephone interview, and questionnaires six to twelve months post index ED visit. Medical record reviews were conducted by trained research assistants using standardized abstraction forms; any discrepancies were resolved by consensus upon re-examining the chart. The questionnaire package was offered online (Research Electronic Data Capture; REDCap) or sent to the home address by mail with a pre-paid return envelope, depending on participant preference. REDCap is a secure, web-based electronic data capture tool designed to support data capture for research studies (hosted at CHEO; Harris et al., 2009). Adolescents aged 14 and above were given the opportunity to participate alone if they wished; therefore primary respondents were either caregivers or the adolescent themselves. All interviews and measures were conducted in the participants’ preferred language (English or French).

The study did not influence or intervene in patient care; all youth and their families received standard clinical care in the ED. This study was approved by the CHEO's Research Ethics Board (14/44X) and the University of Ottawa's Research Ethics Board (A10-14-03).

Variables and Measures²

The measures used in this study were chosen based on the following criteria: (1) brevity and ease of administration (2) established and sound psychometric properties, (3) availability in French, and (4) low cost. A variation on the Padgett and Brodsky (1992) model was used to categorize variables into demographic, service utilization, clinical, and family factors (Leon et al., 2017).

Demographic Factors. Age, biological sex, neurodevelopmental co-morbidity, and child welfare agency involvement were extracted from youth's medical records, while caregiver education was captured during the telephone interview. Estimated median family income (in Canadian dollars) was determined based on postal codes and the Postal Code Conversion File (Statistics Canada, 2015). Ethnicity was not collected in keeping with Canadian research ethics board principles.

Service Utilization Factors. Length of stay (LOS) in the ED was extracted from the medical record and dichotomized using CHEO's 5.5 hour benchmark for urgent ED presentations. Estimated distance from hospital (in kilometers; kms) was determined based on postal codes. Due to its highly skewed distribution, distance from the hospital was dichotomized using one standard deviation (40.87 kms) from the mean (36.01 kms) as the cut-off (i.e., approximately 77 kms). Satisfaction with care during the index visit was elicited over the

² See Appendices C-F for more detailed descriptions of recruitment procedure, measures, data sources, and variable coding.

telephone and measured by the Client Satisfaction Questionnaire (CSQ-8), an 8-item self-report measure of patient's' global satisfaction with health care services received (Attkisson & Greenfield, 2004). The CSQ-8 has good internal consistency ($\alpha=.83-.93$) and is correlated with other symptom checklists measures (Attkisson & Zwick, 1982; LeVois & Nguyen, 1981). Prior psychiatric hospitalization and current MH service utilization was queried over the telephone and measured using questions from The Services for Children and Adolescents - Parent Interview (SCA-PI), an interview designed to assess caregiver's reports of youth's MH services received across multiple settings (Jensen et al., 2004). The SCA-PI has good test-retest reliability ($\kappa=.97$; Hoagwood et al., 2004) and concordance with medical records (Ford et al., 2007).

Clinical Factors. Diagnosis (ICD-10-CM code) and presence of suicidality at the index visit were extracted from youth's medical records. Symptom severity was captured by the total score on the validated HEADS-ED; a 7-item MH screening tool completed by ED providers at the time of the visit (Cappelli et al. 2012; Cappelli et al., 2017). HEADS-ED forms were available for 55 percent of participants. Missing forms were completed by a trained rater (research assistant) blinded to study hypotheses using physician/crisis worker notes present in the patients' medical record. A second rater also completed 53 percent of the HEADS-EDs in this sample. Interrater reliability was assessed by intraclass correlation coefficient (ICC; Hallgren 2012; Koo & Li, 2016) to determine the degree of coder consistency. The resulting ICCs were in the moderate range (mean=.712) indicating an acceptable degree of agreement and similar interrater reliability as previously reported for this measure (Cappelli et al., 2012). Perceived severity was measured by the Total Scale of the Strengths and Difficulties Questionnaire (SDQ), a 25-item behavioural screening questionnaire for children and adolescents, which was part of the questionnaire package (Goodman et al., 1997). The SDQ has good internal consistency

($\alpha=.73$), cross-informant correlation ($r=.34$) and test-retest reliability ($r=.62$; Goodman et al. 2001).

Family Factors. Participants were queried about caregiver history of treatment for MH concerns during the telephone interview. Family functioning was measured by the general scale of the Family Assessment Measure (FAM-III), a 50-item self-report questionnaire based on the Process Model of Family Functioning, which was part of the questionnaire package (Skinner, Steinhauer & Sitarenios, 2000). The FAM-III's general scale has high internal consistency ($\alpha=.93$) and acceptable test-retest reliability ($r=.57-.66$ depending on respondent type; Skinner, Steinhauer & Sitarenios, 2000). Perceived burden was measured by a single 4-likert scale item on the Impact Supplement of the SDQ ("Do the difficulties put a burden on you or the family as a whole?"). This item had adequate test-retest reliability ($ICC=.44$) and correlation with a standardized interview rating of burden ($r=.74$; Goodman et al. 1999).

Data Analysis

The data were analyzed using SPSS v.24.0.0.0 (IBM Corp., 2016). Data was screened for normality and linearity problems, outlier influences and missing data. Attrition at the questionnaire package portion of the study (38%; due to failure to complete/return questionnaires) resulted in loss of statistical power for the planned analyses. Markov Chain Monte Carlo (MCMC) Multiple Imputation (MI) was used to retain all participants in the regression analyses (Rezvan, Lee, & Simpson, 2015). All variables were included in the imputation model. Variable distributions of the original data were compared to the 50 imputed datasets and found to be consistent; therefore only pooled estimates from the imputed dataset are presented.

Univariable bivariate logistic regressions (Odds Ratios, ORs; 95% confidence interval,

CI) were conducted with all variables. Then a multivariable bivariate logistic regression (adjusted OR; aOR) , controlling for all other variables and month of presentation, was conducted to determine if family factors were associated with repeat visits over and above demographic, clinical and service utilization factors. A multivariable cox regression (adjusted Hazard Ratios, aHRs; 95% CI) was also conducted to examine variables significantly associated with earlier repeat visits to the ED. Finally, a multivariable negative binomial regression (adjusted Relative Risk, aRRs; 95% CI) was conducted to examine variables significantly associated with a greater frequency of repeat visits to the ED.

Chi-square and independent samples t-tests were used to: (1) compare repeaters to non-repeaters; (2) determine study generalizability by comparing participants to non-participants; (3) explore the impact of respondent type; and (4) determine MI sensitivity by comparing participants who completed the online/mailed questionnaires and those who did not.

Results

During the study period, 448 eligible patients consented to being contacted by study researchers. Of these, 266 (59.4%) participated, including 70 (26.3%) repeat visitors (see flowchart in Figure 10). Participating youth (M age=13.41; SD=2.72) were mostly female (62%) and had an estimated median family income (M=82,195; SD=14,794) higher than the Canadian median (Mdn=67,044). Caregivers were the primary study respondents for 81.5 percent of participants, and 13.2 percent participated in French. At the index visit, 95.1 percent youth were accompanied by a caregiver, 48.1 percent were taking psychotropic medication, 24.8 percent obtained a psychiatry consultation, and 50.4 percent were referred to the crisis intervention program (not mutually exclusive). Demographic data and results from group comparisons

between repeaters and non-repeaters are presented in Table 2.

Predictors of Repeat Visits

At the univariable level, significant predictors of repeated visits to the ED included: having a LOS greater than the 5.5 hour benchmark at the index visit, having received MH services within six months of the index visit, prior psychiatric hospitalization, and having higher symptom severity. Having a parent with a history of treatment for MH concerns was associated with decreased odds of repeat ED visit. Based on univariable logistic regressions, only estimated income was not entered into the multivariable analyses as it was not at all associated with repeat visits (OR=1.00; 95%CI 1.00-1.00). The following variables were significant at the multivariable level in predicting repeated visits to the ED: having received MH services within the six months since the index visit (OR=2.446; 95%CI 1.124-4.571, prior psychiatric hospitalization (OR=2.896; 95%CI 1.003-8.361), higher severity of symptoms (OR=1.287; 95%CI 1.082-1.532), and living closer to the hospital (OR=5.965; 95%CI 1.629-21.847). Having a parent with a history of treatment for MH concerns predicted decreased odds of repeat visits (OR=.271; 95%CI .137-.537). Unadjusted and adjusted ORs and 95% CIs are summarized in Table 3. Goodness-of-fit tests detected that family factors significantly added to the overall prediction of the model ($p = 0.000$, $X^2_{df=20} = 50.784$).

Predictors of Earlier Repeat Visits

Similar to prior published data, nearly half of repeaters (47%) revisited the ED within 30 days of the index visit and 75 percent revisited within three months (see Figure 11; Peterson et al., 1996; Tossone et al., 2014). The following adjusted variables predicted earlier repeated visits: having received MH services within the six months since the index visit (aHR = 2.266;

95%CI:1.124-4.571), having higher severity of MH symptoms (aHR = 1.213, 95%CI:1.066-1.381), and living closer to the hospital (aHR = 4.592, 95%CI:1.490-14.148) predicted increased odds of earlier repeat presentations. Having a parent with a history of treatment for MH concerns (aHR = 0.361, 95%CI:0.216-0.605) predicted a decreased odds of earlier repeat visits. Adjusted HRs for all variables are presented in Table 4.

Predictors of Frequency of Repeat Visits

Number of repeat visits ranged from one to 11 within the six month period (see Figure 12). The following adjusted variables predicted more frequent repeated visits: having received MH services within the six months since the index visit (aRR = 2.056, 95%CI:1.046-4.041), prior psychiatric hospitalization (aRR = 2.342, 95%CI:1.024-5.356), having higher severity of MH symptoms (aRR = 1.157, 95%CI: 1.014-1.319), presenting with suicidality (aRR = 1.983, 95%CI:1.132-3.474), and living closer to the hospital (aRR = 5.618, 95%CI:1.647-19.231). Having a parent with a history of treatment for MH concerns (aRR = 0.339, 95%CI (0.204-.562) predicted decreased odds of visiting frequently. Adjusted RRs for all variables are presented in Table 4.

Respondent Type

Adolescents aged 14 and above were given the opportunity to participate by themselves if they wished; therefore primary respondents were either caregivers (81.5%) or the adolescent themselves (18.5%). We explored differences between respondent types on all variables except for age. Results showed that a patient diagnosis of a behavioral disorder at the index visit was significantly more common in caregiver respondents (12.9%) than adolescent respondents (3.6%; $p=.019$), while adolescent respondents had significantly greater satisfaction ($M=23.84$, $SD=5.72$)

with care received at the index visit compared to caregivers ($M=22.02$, $SD=7.02$; $p=.023$).

Questionnaire Completion

To determine if the low questionnaire completion rate (38%) impacted the results, we compared questionnaire completers to non-completers. Results showed that those who completed questionnaires had significantly higher caregiver education ($p=.035$), higher estimated income ($p=.001$) and lived closer to the hospital ($p=.018$).

Generalizability of the Sample

To determine the representativeness of our sample to the overall population of children and adolescents who presented to CHEO's ED for MH concerns, we compared study participants to those who were eligible but did not participate (unreachable or declined to participate) on available clinical and demographic characteristics (age, diagnosis, estimated income, and month of index presentation). Participants were significantly younger than non-participants ($p<.001$) as a greater proportion of families of children six to 12 years old ($Mdn=10$, $IQR=9.0 - 11.5$) participated than families of adolescents 13-18 years old ($Mdn=15$, $IQR 14.0 - 16.0$). Participants also presented with significantly more anxiety disorders ($X^2 (1, N=1876) = 5.53$, $p=.019$) and behavioural disorders ($X^2 (1, N=1876) = 4.58$, $p=.032$), but with significantly less substance disorders ($X^2 (1, N=1876) = 12.55$, $p=.000$) than non-participants.

Discussion

The high volume of pediatric repeat visits to the ED contributes to ED overcrowding and may reveal unmet clinical and service needs in some patients. The role of caregivers has been largely neglected within the context of pediatric repeat ED visits. In this study, two out of the three family factors investigated —family functioning and perceived family burden— were not

significantly associated with an increased risk of a repeat ED visit within six months. However, the third family factor, history of caregiver MH treatment, reduced the odds of having a repeat visit, earlier and more frequent repeat visits.

Only one other study has investigated prior caregiver experience seeking MH care for their child and found this family factor to increase the odds of repeated ED visits (Sobolewski et al., 2013). These findings may therefore suggest that child and caregiver experience with MH services have a differential impact on return visits. It is possible that caregivers familiar with the capacity and resources of the MH system from past experience are less likely to bring their child back repeatedly, possibly deciding to access other MH resources instead. On the other hand, the family variable described in the Sobolewski study (2013) might be capturing families who are heavy users of the MH system in general, possibly because of more complex needs, difficulty meeting service eligibility criteria, or escalating environmental stressors. It is also possible that the caregivers of repeat visitors might have untreated prior or current mental health concerns, thereby decreasing the odds of seeking further MH services for their youth. Studies of repeated ED visits for physical concerns in a pediatric population have considered rates of depression in mothers and found that severity of maternal depression symptoms was significantly associated with missed pediatric outpatient visits, adherence to medication management, greater six-month ED use, and perceived difficulty in taking care of their child (Flynn et al., 2004; Grupp-Phelan, Whitaker, & Naish, 2003). Moreover, women who experience post-partum depression were less likely to seek mental health services out of fear of being labeled a “bad mother” or losing custody of her children (Dennis & Chung-Lee, 2006; Button et al., 2017; Sword et al., 2008). Finally, there is also the possibility that family factors, other than those examined, including

parental stress, parenting styles and parental coping strategies might have contributed more substantially to repeated pediatric ED visits for MH.

Results from demographic, service utilization and clinical factors are consistent with findings from a recent systematic review (Leon et al., 2017). In terms of service utilization factors, we found that distance from hospital and receiving MH services were predictors of repeat ED visits as well as earlier and more frequent visits, while past psychiatric hospitalization was associated with repeat ED visits and more frequent visits, but not earlier visits. In terms of clinical factors, we also found severity of symptoms to be an important predictor of repeated visits, repeating earlier and more frequently. There are mixed findings in the literature concerning severity of symptoms which might be explained by differences in how it is measured (Leon et al., 2017). In this study, the HEADS-ED total score was used rather than triage level, since nearly all MH patients were triaged as urgent in our sample. While triage level is a single item indicator of severity at the time of presentation, the HEADS-ED takes into consideration multiple indicators (e.g., home; education; activities and peers) which might better capture overall severity. Suicidality at the index visit only predicted more frequent visits which may suggest that the ED is considered the first point of access when safety planning for youth with suicidal ideation. Professionals may tend to more readily direct youth to the ED for immediate monitoring and further assessment when suicidality is involved, but not necessarily for other MH concerns.

Strengths and Limitations

This study is the first to examine the contribution of multiple family factors in predicting repeat pediatric visits to the ED for MH reasons and to use an integrated approach of medical

records, clinician assessment, and self-reported data to investigate factors associated with repeated visits, earlier and more frequent visits. Telephone interviews and questionnaires allow for data corroboration, less reliance on potentially missing records, and a greater breadth of information on motivations behind return ED visits. However, there are also limitations to this method of data collection. First, we considered selection bias and found that study participants were more likely to be six to 12 years old, have an anxiety disorder or a behavioural disorder, but less likely to have a substance disorder. Findings from this study might therefore not be generalizable to older adolescents or those with substance use disorders. Second, attrition was also an issue since approximately one-third of participants did not complete the self-report questionnaires. We addressed this by using multiple imputations; which uses existing data to replace missing data with plausible values (Rezvan, et al., 2015). Given that those who completed questionnaires had significantly higher caregiver education, estimated family income and lived closer to the hospital, results from the FAM-III and the SDQ might not be generalizable to lower income, lower educational achievement and more rural households. Third, in terms of possible confounding factors, we were unable to collect information on ethnicity which limited our understanding of the impact of this variable. Family income was estimated based on postal code which might not have reflected the true variation in family incomes in this sample. Finally, as health care in Canada is publicly funded by province, findings might be less generalizable to other provinces and countries. Nevertheless, overall findings were in line with previous Canadian and American research.

Clinical and Research Implications

The finding that being connected to outpatient services, having had prior psychiatric hospitalization and higher severity of symptoms increase the risk of repeat ED visits suggests

that these youths generally have high needs and are experienced users of the MH system. During their assessment, ED providers might find it useful to determine if current MH services are meeting all patient MH needs as some might be facing more complex issues, difficulty meeting service eligibility criteria, or escalating environmental stressors. Information on current services and discharge resources is seldom or incompletely charted in patient's medical records, possibly due to time constraints, and it is unclear if this information is taken into consideration by ED professionals (Cappelli et al., 2012). Using assessment tools within the ED, such as the HEADS-ED (Cappelli et al., 2012; 2017) and the Caregiver Perception Survey (Cloutier et al., 2010), that evaluate the impact of current discharge resources (for example, are they well connected, somewhat connected, waitlisted, non-compliant, or are services not meeting their current needs), and family stressors, such as caregiver MH, on the child's functioning may also be useful to standardized the collection of this information. EDs might want to consider providing information on 24hr crisis lines and urgent care services to all patients presenting to the ED with MH concerns. More generally, the development of clinical pathways specific to pediatric MH in the ED may help foster greater collaboration and integration with other MH sectors, such as primary care, schools and community-based MH agencies (Barwick et al., 2015; (Stiffman et al., 2000) which might reduce repeated visits.

Future research should continue to investigate how EDs can better serve MH visitors. More specifically, data in this study did not permit us to determine adherence/compliance, satisfaction, responsiveness, availability, and appropriateness of current or past MH services, which might be crucial in better understanding how families and youth move through the continuum of MH services.

Conclusions

This study found that current and past youth and caregiver MH service use and severity of symptoms were significantly associated with repeat ED visits. Healthcare providers should therefore consider caregiver and youth service utilization factors to inform patient management and discharge planning. Results from this study, in concert with previous findings, can help inform clinical decisions related to care provided in the ED for pediatric MH issues.

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Chapter 4: General Discussion

The primary objectives of this thesis were to systematically review the existing literature on youth mental health (MH) return visits to the emergency department (ED) and determine the incremental contribution of family factors in predicting these repeat visits. Chapter 4 aims to provide an in-depth discussion of the role of family factors in repeat ED visits, describe the limitations of both studies and the overall thesis, outline the proposed solutions to repeat ED visits as well as the practical implications of findings, and lastly, discuss the overall contributions of this thesis.

1. The Role of Family Factors: Interpretation of Results and Discussion of Limitations

To determine the current state of the literature in pediatric MH repeat ED visits, Study I systematically reviewed all the available evidence and provided qualitative analysis of repeat visitor characteristics, predictors of repeat visits, as well as predictors of the recency and frequency of repeat visits. Study I identified significant gaps in past research which has limited our understanding of why some children and adolescents come back to the ED repeatedly. These gaps are: (1) the lack of consensus on the operational definition of what is a repeat visit, (2) the inconsistent time window between the index visit and the return visit, (3) the lack of a theoretical framework to guide variable inclusion, (4) the use of retrospective designs solely reliant on medical records or administrative databases, and (5) the lack of information on variable interaction, confounding variables and additional outcomes. Consequently, Study II attempted to address some of these gaps by providing a clear definition and rationale for a six-month repeat visit window, by using a modified version of the Padgett & Brodsky (1992) model as its theoretical framework, by using interview and questionnaire data, and by further exploring additional outcomes (recency and frequency).

Despite the fact that there is evidence that families and caregivers play an important role in helping or hindering youth in accessing health and MH services, Study II found caregiver history of MH treatment to be the only family factor significantly associated with repeat ED visits. Moreover, contrary to the original hypothesis, caregiver history of MH treatment decreased the odds of having a repeat ED visit. This is even more surprising as a study conducted in the same hospital reported that youth and parents identified a number of family stressors as the reason behind pediatric ED visit for MH: parent issues, sibling issues, traumatic/stressful events in the family, marital discord, and financial difficulties in the family (Cloutier et al., 2010).

There are many possible reasons why neither family functioning or perceived burden were found to be associated with repeat ED visits: (1) sample composition and recruitment methodology; (2) choice of family factors and measures; (3) factors outside of the modified Padgett & Brodsky model.

Study II Sample Composition and Recruitment Methodology. Compared to articles analyses in Study I, Study II is the first study to integrate medical records, telephone interview and questionnaire data to investigate repeat pediatric MH visits to the ED. The use of this data collection design allows for data corroboration, lower reliance on potentially missing records and a greater breadth of information on factors and motivations behind return visits. However, recruiting patients, as opposed to using a database, introduces possible recruitment bias. Participants in Study II represented a sub-sample of CHEO ED visitors and were not fully representative of all patients who visited the pediatric ED for MH concerns during the study period. In fact, only 18 percent of all pediatric patients were successfully recruited as participants. To determine the presence of recruitment bias, those who participated in the study

were compared to the overall population of children and adolescents who presented to the ED for MH concerns during the same time period (i.e., those who were eligible but did not participate because they were unreachable or declined to participate) on available clinical and demographic characteristics (age, diagnosis, estimated income, and month of index presentation). There was no significant difference in estimated family income or in month of index presentation between the two groups. However, there was a significant difference between participants and non-participants in terms of age. Participants were significantly younger than non-participants because a greater number of families of children (six to 12 years old) participated than families of adolescents (13 to 18 years old). There were also significant differences between groups with regards to diagnostic category. Participants presented with significantly more anxiety disorders and behavioural disorders, but with significantly less substance use disorders than non-participants.

Results from Study II were also affected by attrition at the questionnaire phase. Thirty-eight percent of the questionnaire packages were not completed by participants. It was therefore important to determine if participants who completed the questionnaires were representative of other participants. Questionnaire completers and non-completers were compared on all study variables. Results showed that those who completed questionnaires had significantly higher parental education, higher estimated income, and lived closer to the hospital. Considering that questionnaires require significant reading and time to complete, it is possible that those with higher education and income were associated with completing the questionnaires because they may have more time to give and/or might consider research as being more important. This may also mean that results better represent a more resilient sample. Moreover, because of this missing data, the sample size was reduced which would have decreased the statistical power in

multivariable regression analyses. To address this issue, multiple imputation was used to retain all participants for statistical analyses. The multiple imputation technique uses the distribution of existing data to replace missing data with plausible values (Rezvan, Lee, & Simpson, 2015). Multiple imputation is preferable to traditional techniques of dealing with missing data (e.g., case deletion, mean imputation) since it is less affected when missing data is not missing completely at random (MCAR; Rezvan, Lee, & Simpson, 2015). In Study II, those who completed the questionnaires were significantly different from the non-completers in terms of parental education, estimated income and distance from hospital. Results obtained from the variables measured in the FAM-III and SDQ questionnaires, family functioning, perceived burden and perceived severity, are therefore less generalizable to lower income, lower educational achievement and possibly more rural households.

In addition, findings related to some of the variables in this study were also limited because of how the information was collected and measured. Income and distance from hospital were both determined by the postal code recorded on the patient's medical chart. Measuring distance from hospital based on postal code was not as useful as anticipated. First, it assumes that families are at home when they decide to present to the hospital. Many youth attend the ED during the day and on week days, which possibly means that they are going to the ED directly from school. In the case of caregivers who are divorced/separated, the youth might also have been living at a different location and distance from the hospital at the time of the visit, making our estimate inaccurate. A second possibility is that some families might have moved during the study period and the postal code on the medical chart might not have been updated. In fact, many letters that were sent out during the recruitment phase were returned due to a wrong address. Income was also estimated based on postal codes and was prone to the same issues. Moreover,

estimated income was determined by matching the postal codes available in patients' medical records to the median family income using the Postal Code Conversion File (Statistics Canada, 2015). The use of median family income may have reduced variability and probably does not accurately represent the income of each family (Statistics Canada, 2015).

Youth in the care of CAS and crown wards might have been underrepresented in Study II. In Study I, a study conducted in the same hospital reported 6.8 percent of patients currently in care (Cloutier et al., 2016), while in Study II 5.7 percent had past or current involvement in care. During our recruitment process, youths in care were extremely hard to contact as they often lived in group home or with foster parents. Past or current involvement with CAS for families and youth who did participate was determined by reviewing their medical records. This characteristic is important as we know that childhood maltreatment is a risk factor for MH ED visits and repeat MH ED visits (Rhodes et al., 2012, 2013). Finally, we were not able to collect information on ethnicity due to REB restrictions, limiting our understanding of the impact of this variable. This would have been important to address since Study I revealed that, in some American and Canadian studies, ethnic minority was associated with repeat visits (Frosch, dosReis, & Maloney, 2011; Goldstein, Frosch, Davarya, & Leaf, 2007; Newton et al., 2012; Pickner et al., 2016).

Psychiatric rehospitalization (readmission to an inpatient unit) and hospitalization at the index visit were an exclusion criterion in Study I and II respectively. There are many reasons for this decision. First, hospitalization is a related, but a separate, MH service to ED visits as the majority of admittances are done through the ED. The decision to admit is mostly based on severity, diagnosis and availability of beds. Therefore, those who are hospitalized might be quite different in their presentation and demographics. Second, the needs and experiences (length of

admission, type of provider and treatment, follow-up care) of patients admitted to an inpatient unit might widely differ from each other and greatly differ from that of ED visitors who are not hospitalized. Moreover, patients who were hospitalized would also not have had the same time to repeat than other patients depending on length of hospitalization. Hospitalizations at the index visit were therefore excluded to reduce confounding variables. Finally, predictors of re-admissions have been investigated elsewhere (Blader, 2004; Fontanella, 2009). Considering there was already great variability in predictor variables and outcomes in the research summarized in Study I, including rehospitalizations would have made it even harder to analyze the findings. As a consequence, Study II might not be as comparable to other research reviewed in Study I. It is also possible that family or caregiver characteristics might have a greater impact on children and adolescents when they are hospitalized and that this might be the reason family functioning and perceived burden were not found to be significant in Study II.

The last aspect of the recruitment methodology which might have limited our findings is the timing of the questionnaires. Although we attempted to contact patients six months after their index visit, because of the three recruitment phases (two waves of mailed letters and one wave of telephone calls) and timing delays (e.g., no calls were made during the holidays, families asking to be contacted at a later time) some participants were only truly reached up to 12 months after their index visit. Therefore, recall bias is a limitation of data collected through the telephone interview and the questionnaires, which included the two family measures and perceived severity. This also puts into question directionality of the association between predictors and the outcome variable.

To summarize, results from Study II need to be interpreted through the lens of participant

composition, which was less generalizable due to recruitment and attrition bias. The study design and recruitment procedures might also explain our limited findings concerning the role of family functioning and perceived burden in predicting repeat MH visits to the ED.

Choice of family factors and measures. Study II examined the contribution of three family factors: family functioning, perceived burden, and caregiver history of MH treatment. It is possible that the questionnaires used to measure family functioning and family burden might not have captured the constructs adequately. The measures used in this study were chosen based on the following criteria: (1) brevity and ease of administration, (2) established and sound psychometric properties, (3) availability in French, and (4) low cost. Moreover, there is also the possibility that family factors, other than those examined—including parental stress, parenting styles and parental coping strategies—might have contributed more substantially to repeated pediatric ED visits for MH.

Family functioning was measured using the Family Assessment Measure (FAM-III) General Scale, which comprises 50 self-reported statements and focuses on the family functioning from a systems' perspective and is self-reported (Skinner, Steinhauer, & Sitarenios, 2000). The FAM-III has been shown to distinguish between families with difficulties (drug dependency, violence, trauma) from families without these issues, to be correlated to the MMPI, and to be useful in monitoring family functioning across sessions (Skinner et al., 2000). Internal consistency was high and test-retest reliability was acceptable (Skinner et al., 2000). However, investigations have highlighted that the General Scale is influenced by the rater's attribution of the current family problems (Skinner et al., 2000). For example, if a parent labels the child as the unique source of the problem, rather than the family unit, scores in the FAM-III might fall within

the average range. In Study II, the FAM-III was completed after the SDQ, a measure that is youth problem-centric and might have shifted the mindset of caregiver respondents towards perceiving the child or adolescent as the ‘problem’. Furthermore, the FAM-III has never been used to predict service access or utilization. In the Fontanella et al. (2008) study which investigated family functioning, they used the Family Functioning scale of the Childhood Severity of Psychiatric Index (CSPI) scale which was rated by researchers based on medical record information. Therefore, it is possible that self-reported (perceived) family functioning might not be as useful as researcher, and possibly clinician, perception/assessment of family functioning. Another measure, Family Adaptability and Cohesion Scale (FACES-IV; Olson, 2010), was initially considered, however it was slightly longer (62 items) and measures family cohesion and flexibility which are concepts related to family functioning but not exactly overlapping.

Perceived burden was measured using a single self-reported item (question 34) on the impact supplement of the Strengths and Difficulty Questionnaire (SDQ)(Goodman, 1999). Participants rated “Not at all”, “Only a little”, “A medium amount”, or “A great deal” to the following question: “Do the difficulties put a burden on you or the family as a whole?”. Validity of this burden rating was good as shown by a correlation of .74 with a standardized interview rating of burden (Goodman, 1999). Although the advantage of measuring perceived burden with a single item was that it reduced participant time and could be completed by caregiver and youth respondents, the disadvantage is that the four Likert-scale scoring minimizes variability in responses and might not have been explicit enough in capturing all possible difficulties caused by the child’s mental illness. In the Angold et al. study (1998) which investigated parental burden, they used the Child and Adolescent Burden Assessment (CABA). This 20-item measure

asks caregivers whether they have perceived a range of areas (e.g., finances, relationships, activities, well-being, sense of competence) as being affected or exacerbated by their child's psychiatric symptoms (Angold et al., 1998). Therefore, a longer and more complex measure might have better captured the level of burden on the family.

It is also possible that family and parental factors, other than those examined, might have contributed more substantially to repeated pediatric ED visits for MH as some have been associated with other types of MH services. For example parental stress has been found to reduce the risk of psychiatric re-hospitalization for those with parents reporting higher stress in their parenting roles (Blader, 2004). Authors hypothesized that parenting stress might reflect higher emotional involvement by caregivers yielding better clinical outcomes (Blader, 2004). Another study found that parental stress was related to poor coordination between MH services, but not related to number of services received (Yatchmenoff, Koren, Friesen, Gordon, & Kinney, 1998). Permissive parenting style was also found to increase readmission rates in another study (Fite, Stoppelbein, & Greening, 2009), while lower parental self-efficacy in the management of suicidality was associated with future attempted suicide (Czyz et al., 2017). Finally, caregiver perceived stigma exerted a strong influence on youth's MH service utilization (Gronholm et al., 2015).

To summarize, it is possible that family functioning and perceived burden were not found to be significant predictors of repeat ED visits because the measures chosen in this study might not have captured these constructs adequately. There is also the possibility that other family factors might have had a stronger association with repeat ED visits. Overall, the measures and procedures used in Study II were developed with the intent to minimize burden on participants,

however many constraints of time and resource existed which might have ultimately limited the strength of the findings.

Factors outside of the Padgett & Brodsky model. Repeat visits to the ED are conceptualized as the behavioral outcome, the endpoint of a chain of decisions whose ultimate conclusion is that the ED is the most appropriate care at that moment in time (Padgett & Brodsky, 1992). Past analysis of the Padgett & Brodsky as well as the related Anderson models typically account for 25 percent of variance in service use, which means that factors other than those investigated have an impact on the decision to return to the ED (Stiffman et al., 2001). This section explores other possible models and factors that might impact return ED visits.

The Revised Network Episode Model, revised for children and adolescents, suggests that the focus be shifted to social rather than individual characteristics in service access and utilization (Boydell, Volpe, Gladstone, Stasiulis, & Addington, 2013). This model has not yet been widely researched, but there is evidence that the school social network might play a greater part in symptom recognition and help-seeking than anticipated (Boydell et al., 2013). However, although this model might explain initial help-seeking, it might not be as useful in the case of repeat ED visits as it focuses on recognition of the problem, not how youth navigate the MH system once a problem has been identified.

On the other hand, the works of Stiffman et al. (2001) have suggested that the focus be shifted to include provider's perceptions and decision-making process. Studies examining organizational context factors have not yielded positive results because these factors might be too far removed (Stiffman et al., 2001). However, gateway providers' attitudes, knowledge, awareness of MH and MH services might have more proximal impact on the decision of families

and youth to seek MH care. In a study of this provider model in a sample of adolescents within youth services, the variance in MH service provision explained climbed to 55 percent (vs. 24% in the regular model). The most critical factors were: provider perception of need, provider knowledge of resources, and provider burden (Stiffman et al., 2000, 2001). Both school and health care provider variables are considered to be in Bronfenbrenner's microsystem; therefore the proposed modified Padgett & Brodsky model could easily incorporate these variables as well. Although no provider variables were included in Study II, it is possible that ED professional MH training, awareness of resources and burden might impact ED returns. However, it is also possible that the "gateway" providers in the decision to re-visit the ED are the youth's current primary care, MH provider or school staff. Study I and II have showed that currently receiving MH services is a significant predictor of repeat ED visits and provider characteristics might therefore mediate these results.

In brief, this thesis utilized a Bronfenbrenner adapted version of the Padgett & Brodsky model, itself a version of the influential Anderson model,. Other models, such as the ones briefly described above, have also attempted to modify the Anderson model to fit the reality of child and adolescent MH help-seeking. In line with Bronfenbrenner's model, the underlying theme in all three modifications is the addition of the impact of relevant adults in these youth's lives which are thought to be located in the microsystem: caregiver, school staff, and health care providers. It is possible that for any given youth the influence of these adults might differ depending on the youth's circumstances and the role these adults play in their lives.

2. Practical Implications

Results from Study I showed that the variables most significantly associated with repeat

ED MH visits were: socioeconomic status, involvement with child protective services, and previous and current MH service use. Study II found that receiving MH services within the six months since the index visit, having a higher severity of symptoms, and having a parent with a history of treatment for MH concerns were significant predictors of repeat visits, more recent visits and more frequent visits. The following section explores the possible practical implications of each of these factors on the management of MH visitors in the ED. These suggestions might be useful avenues for future research to determine their impact on the management of MH visitors in the ED and reducing repeat MH visits.

Socioeconomic status. Although estimated income was not a significant predictor in Study II, research articles uncovered in Study I suggest an association between lower socioeconomic status and repeat ED visits. When providing recommendations for further MH services to families with lower income, ED professionals may want to take into consideration whether the services are affordable (free or offer sliding scale), accessible (close, near public transportation), and/or offer services in the evening/weekends. Inquiring about additional family specific barriers to treatment (e.g., daycare for other children during therapy) would also be important.

Involvement with child protective services. Although this was not a significant predictor in Study II, Study I uncovered research suggesting an association between child protective service involvement and repeat ED visits. The higher likelihood of repeat visits might be due to higher MH concerns in this population, possibly because of higher instances of maltreatment and family problems. Childhood maltreatment is a known risk factor for MH ED visits and repeat MH ED visits (Rhodes et al., 2012, 2013). Youth in care may also be more

likely to go to the ED repeatedly because of child protective services protocols. EDs may want to consider building stronger ties with local child protective services centers and develop ED protocols that take into consideration the increased level of vulnerability these youth might be experiencing (for ex., exposure to trauma, higher needs).

Current MH service use. Current MH service use was an important predictor in Study I and II. It might be important for ED professionals to consider inquiring about attendance, compliance, satisfaction, barriers and appropriateness of the MH care youth are currently received. EDs may also want to consider the advantages of easy and quick information sharing with primary care and/or MH professionals in order to improve care continuity and reduce future ED visits. If the visit is deemed to be for non-emergent concerns ED professionals might want to consider providing information/education on more appropriate services to access and empower parents so that they may feel more confident to manage child behaviour at home until their current provider is available.

Past MH service use/hospitalizations. Past MH service use and prior psychiatric hospitalizations were important predictors in Study I and II, however there is no way to address or change past MH care utilization. Nevertheless, knowing that repeat visitors tend to have had services in the past establishes a pattern of heavy MH care usage, which might underlie greater severity, complexity, or increasing environmental or personal stressors. ED professionals might want to inquire about reasons for the current visit and provide additional support in linking youth and families to services that adequately addresses their evolving needs.

Symptom Severity. Measures of symptom severity were often significantly associated with repeat visits in Study I and II. Youth and families who present to the ED, even repeatedly,

with a high severity of symptoms are deemed appropriate visits. However, chronically elevated symptoms, especially suicidality, might indicate that the youth needs immediate treatment, that treatment modality might need to be changed, that treatment frequency is not high enough, or that other stressors not previously identified are occurring. Again, inquiring about these factors may be considered by ED professionals in order to obtain a greater understanding of the overall clinical presentation.

Caregiver history of MH treatment. Study II found that prior parental treatment for MH concerns decreased the risk of repeat visits and might therefore be a protective factor against repeated ED visits. However, prior research analyzed in Study I has mostly shown parental psychopathology to be a risk factor for health service use in general. Poor past-month maternal MH and negative child behaviors were associated with increased maternal aggravation which in turn increased the odds of outpatient MH visits (Pfefferle & Spitznagel, 2009). In another study parental history of psychiatric problems was associated with MH service use, but not with MH service persistence/adherence (Farmer, Stangl, Burns, Costello, & Angold, 1999). Parental psychopathology was associated with higher likelihood of perceiving their child's behavior as problematic and of reporting the child's problem behaviors (Verhulst & van der Ende, 1997). However in the same study, parental psychopathology was not significantly associated with MH service utilization over and above the contribution of the other factors. It was thought that these parents were possibly not translating their distress into actions that would lead to obtaining a service (Verhulst & van der Ende, 1997). Finally, parental depression/anxiety was associated with a higher likelihood of seeing a MH professional (Briggs-Gowan, Horwitz, Schwab-Stone, Leventhal, & Leaf, 2000). These findings suggest that parental MH concerns increases identification and initial help-seeking, but may not be associated or may even reduce return

visits. ED professionals might therefore find it important to inquire about parental MH, establish its impact on the parent's ability to participate in the youth's MH care and possibly establish linkages to adult MH services for this parent if appropriate. Research has shown that screening for maternal depression is feasible (high compliance) and acceptable (Flynn, Davis, Marcus, Cunningham, & Blow, 2004; Grupp-Phelan, Whitaker, & Naish, 2003; Kahn et al., 1999). However, a major barrier to the implementation of this practice is that emergency physicians in pediatric hospitals might not have the competency to adequately screen for adult MH.

3. General Limitations of this Thesis

Apart from the limitations previously discussed for each study, there exist more general limitations to this area of research. These include: (1) autism and other neurodevelopmental disorders, (2) infant or preschooler MH, and (3) comprehensive MH data tracking.

Neurodevelopmental disorders—including autism spectrum disorder, tic disorders, attention deficit/hyperactivity disorder, and intellectual disability—were only briefly addressed in this thesis. Children with neurodevelopmental disorders, such as autism, typically present to the ED with a set of medical, emotional and behavioural issues (Cohen-Silver, Muskat, & Ratnapalan, 2014; G. Liu, Pearl, Kong, Leslie, & Murray, 2017). These patients often have complex and special needs which can complicate assessment and management within the ED (Clarke, Dusome, & Hughes, 2007; Dolan, Fein, & The Committee on Pediatric Emergency Medicine, 2011). Study I showed that no study has investigated the impact of having a neurodevelopmental disorder on repeat ED visits. In Study II, a primary diagnosis of a neurodevelopmental disorder was an exclusion criterion, but we explored a comorbid diagnosis as a possible predictor of repeat ED visits. Investigating this population is important as research

has shown that the likelihood for a psychiatric ED visit was increased nine-fold among those with autism, especially between the ages of 12 and 15, and were more likely to be due to externalizing and psychotic symptoms (Iannuzzi, Cheng, Broder-Fingert, & Bauman, 2015; Kalb, Stuart, Freedman, Zablotzky, & Vasa, 2012). Furthermore, in one study, a repeat visit was noted to follow within 15 days for 50 percent of patients with autism (Cohen-Silver et al., 2014). This suggests that further explorations into the service use of children and adolescents with neurodevelopmental disorders is warranted as they have many MH ED visits and might require more specialized care management to meet their needs.

This thesis did not specifically address infant or preschooler MH visits to the ED. Although the importance of early developmental factors on later health outcomes has been emphasized in discussions of family factors in Chapter 1, the focus of this thesis has primarily been on child and adolescent MH (six to 18 years old). Nevertheless, it is important to note that five of the studies reviewed in Study I included patients from age 0 in their samples (Boyer et al., 2013; Cloutier et al., 2016; Hamm et al., 2010; Newton et al., 2012; Newton, Rosychuk, Niu, Radomski, & Mcgrath, 2015). One reason that infant and preschooler MH has not been explicitly discussed is because MH is tightly connected with the timely achievement of motor, verbal and socio-emotional developmental milestones in this age group which is often under the purview of primary care providers. At well-baby visits, many primary care providers utilize standardized checklists or screening tools, such as the Rourke Baby Record and the Nipissing District Developmental Screening, that are non-specific to MH but capture some individual and family-level risk factors. The enhanced 18-month well-baby visit specifically has been targeted as an important opportunity for primary care providers to identify vulnerabilities to future MH concerns, such as social determinants of health (e.g., poverty), late developmental milestone

achievement, adverse childhood experiences (e.g., abuse), parental mental illness and substance misuse (Regalado & Halfon, 2001; Williams, Clinton, Canadian Paediatric Society, & Early Years Task Force, 2011; Zeanah, Stafford, Nagle, & Rice, 2005). A search of the literature did not yield any study that specifically examined infants and preschoolers presenting to the emergency room with MH or behavioural issues, which limits our understanding of this age group.

More generally, research on MH services access and utilization in Canada is greatly limited by a lack of outcome monitoring. It has been suggested that there needs to be ongoing collection of the following data in order to appropriately address the needs of Canadian youth and adults: incidence and prevalence of each mental illnesses by age, sex and other key demographic variables; co-morbidity of mental illnesses with other mental and physical disorders; risk and protective factors; impact on quality of life of the individual and family; access and use of primary and private and public mental health care services; stigma; impact legal and penal systems; access to and use of mental health services in other systems, such as schools, criminal justice programs and facilities; and, finally, treatment outcomes (Health Canada, 2002). Currently, very few provinces gather information on children's MH and MH service utilization across service sectors (e.g., primary care, clinics, schools, EDs, juvenile justice; Waddell, Mcewan, Shepherd, Offord, & Hua, 2005). Comprehensive data tracking would permit healthcare providers, researchers, policy experts at the federal and provincial levels to examine patterns of MH service utilization in more detail and improve access and care. Gathering this information would also help to improve service fragmentation and help elaborate targeted MH strategies for child and adolescents (Waddell et al., 2005). Considering that service access and utilization factors were important predictors of repeat ED visits, such information

would be crucial for future studies on the subject. Moreover, such databases would enable researchers to access larger samples of ED visitors and make regional and hospital comparisons, thereby increasing generalizability of findings.

To summarize, research in the area of pediatric repeat MH visits to the ED has largely failed to investigate predictors of revisits in specialized populations, such as children and adolescents with autism and other neurodevelopmental disorders, and younger age groups, such as infants and preschoolers. Moreover, research in this area is limited by a lack of comprehensive data tracking within the MH care sector across Canada.

4. Proposed Solutions Up-to-Date and Recommendations for Future Research

Increases in pediatric ED visits for MH have been well documented (Dolan, Fein, & The Committee on Pediatric Emergency Medicine, 2011; Leon, Cloutier, Bélair, & Cappelli, 2014; Newton, Rosychuk, Niu, Radomski, & Mcgrath, 2016; Pittsenbarger & Mannix, 2014; Rogers, Mulvey, Divietro, & Sturm, 2017), however a portion of these visits are non-urgent, tax the ED's capacity and incur high costs (Chun, Katz, Duffy, & Gerson, 2015; Grupp-Phelan et al., 2007; Mahajan et al., 2009; Mapelli, Black, & Doan, 2015; Newton et al., 2009). The ED's mandate is to assess, stabilize and discharge to outpatient or inpatient services, not provide comprehensive treatment. Research has therefore focused on three possible areas that might reduce MH visits to the ED, decrease MH symptoms, and meet the needs of MH ED visitors by providing them with access to appropriate MH services: (1) increasing recognition and MH capacity in primary care and community-based MH care services, (2) providing better MH care within the ED through assessment, diagnosis, and brief interventions, and (3) closing the gap to outpatient MH services.

The Role of Primary Care and Community-based MH Services. Many believe that the shortage of pediatric MH professionals and restrictive hours of operation (daytime and weekday) coupled with the fragmentation of MH services is one of the main drivers behind increases in MH ED visits (American Academy of Pediatrics & American College of Emergency Physicians, 2006; Baren et al., 2008; Chun, Sindelar-Manning, Eaton, Lewander, & Spirito, 2008; Geller & Biebel, 2006; Grupp-Phelan et al., 2009). One proposed solution is to make changes to the current MH system by allocating greater investments in MH services, increasing MH providers, and creating better integration and stronger collaboration between different MH settings (Kolko et al., 2014; Kutcher, Davidson, & Manion, 2009). The following section will provide an overview of specific changes that have been proposed to the current MH system that could address the increase in MH visits and MH repeat visits.

The primary care setting has been identified as one target for improvement since it provides a unique opportunity to address the MH needs of children and adolescents (Cappelli & Leon, 2017). Primary care providers have regular and ongoing contact with many children and adolescents, often starting before the child enters school (Simonian, 2006). However, rates of MH symptom recognition by primary care providers continue to be lower than prevalence rates, suggesting considerable under-diagnosis (Kramer & Garralda, 2000; Sayal & Taylor, 2004). Reasons include the child and adolescent's perception of their primary care provider's attitude towards MH and interpersonal skills (Biddle, Donovan, Gunnell, & Sharp, 2006; Sayal et al., 2010) as well as financial disincentives for physicians to address and treat MH issues (Ashcroft, Silveira, & McKenzie, 2016). In fact, current billing codes do not take into consideration the higher burden of care required when working with a new or exacerbated MH condition, the overlap between physical and MH problems, or the greater time needed for non-client contact

services such as case discussions, referral input, and consultation (Centre for Addiction and Mental Health, 2016; Kates et al., 1996). Therefore, it has been proposed that primary care providers receive greater MH training during residency and as part of their continuing education requirements (Collaborative Working Group on Shared Mental Health Care, 2000; Dolan et al., 2011), that a greater number of MH professionals be part of primary care teams (Asarnow, Rozenman, Wiblin, & Zeltzer, 2015; Vallance, Kramer, Churchill, & Garralda, 2011), and that Ontario billing codes be changed to better incentivize physicians to take on and treat MH patients (Collaborative Working Group on Shared Mental Health Care, 2000).

Another target for improvement has been community-based child and youth MH services. It is well documented that demand for community services is high and increasing, while availability of appropriate providers is low (Healy, Naqvi, Meagher, Cullen, & Dunne, 2013), resulting in long waitlists. Wait times will vary depending on region, services and clinical priority level, but can easily reach 12 months which greatly exceeds the Canadian Psychiatric Association's proposed wait time benchmarks of 24 hours for emergent care, two weeks for urgent care, and one month for scheduled care (Canadian Psychiatric Association, 2006; Kowalewski, McLennan, & Mcgrath, 2011). This is an even greater problem in rural/remote areas where the availability of MH providers with specific child and adolescent knowledge is scarce (Zayed et al., 2016). The high cost of care and insurance restrictions on MH services also diminishes access to community-based services (Kelleher, Taylor, & Rickert, 1992). In Ontario, community-based agencies are publicly funded and the Ontario Health Insurance Plan (OHIP) covers physician-delivered treatment, however psychotherapy provided by MH professionals (psychologists, social workers, counsellors) in private practice is fee-for-service and can quickly become very costly. Other barriers exist for families with limited financial means and older

adolescents seeking services on their own since they might be restricted by location (e.g., public transportation) and hours of operations (e.g., need to take time off from work/school; The Canadian Association of Paediatric Health Centres, The National Infant, Child, & The Provincial Centre of Excellence for Child and Youth Mental Health at CHEO, 2010). Finally, there is an increased recognition that collaborative interdisciplinary care (Cappelli & Leon, 2017; Greene, Ford, Ward-Zimmerman, & Foster, 2015) and better delineation of roles and responsibilities (Greene et al., 2015; Heneghan et al., 2008; Ontario Medical Association, 2015) is deeply needed since providers and clients alike report that important information is often poorly communicated (Hacker et al., 2013). It has therefore been proposed that community-based MH services be better integrated and connected with primary care (Kolko et al., 2014; Kutcher et al., 2009), that a proportion of the cost of services provided by MH professionals in private practice be covered by OHIP (Moulding et al., 2009), and that greater efforts be put into reaching underserved populations such as those living in rural/remote areas (Zayed et al., 2016).

To conclude, it is believed that patients attend EDs because it is their only option or because community resources are unavailable or unknown (Christodulu, Lichenstein, Weist, Shafer, & Simone, 2002) and that changes to primary care and community-based youth MH care could reduce the ever increasing ED visits. Although it is clear that our current MH system is lacking in many respects and that the proposed changes described above would improve access to much needed MH services for many youth and families, there is currently little evidence that these changes would result in a decrease in MH visits to the ED. First, when hours of operation and access to primary care were examined specifically, it was not significantly associated with repeat visits (Rogers & Attia, 2017), which challenges the assumption that patients choose to present to the ED only when no other services are available. In addition, prior and current use of

MH services has generally been associated with increased repeat ED visits (Leon et al., 2017). On the other hand, as emphasized in Study II, current data does not permit us to determine adherence/compliance, satisfaction, responsiveness, and appropriateness of current or past MH services. Patient compliance with current treatment was investigated in two previous studies and found conflicting results, but was nevertheless associated with repeat ED visits (Cloutier et al., 2016; Cole, Turgay, & Mouldey, 1991). More research is needed to investigate whether characteristics of outpatient services can mediate these findings.

Improved ED Care for Pediatric MH Concerns. Very few EDs base their pediatric MH care on published evidence and it has been suggested that this lack of clear pediatric MH protocols/guidelines/processes and clinical pathways can significantly affect clinical outcomes and post-ED service utilization, such as hospitalizations and repeat visits (American Academy of Pediatrics & American College of Emergency Physicians, 2006; Leon et al., 2013). Therefore, the second proposed solution has been to improve care within the ED by examining the impact of provider type, team composition and protocols on patient care. The following section provides an overview of models of ED MH management that have been investigated and/or evaluated.

Recent studies have examined the outcomes of the implementation of a dedicated child MH team for child and adolescent patients and found decreases in LOS (Sheridan et al., 2016; Uspal, Rutman, Kodish, Moore, & Migita, 2016), use of restraints and physical interventions (Uspal et al., 2016), and hospitalization rates (Sheridan et al., 2016). Another study conducted a randomized controlled trial of a brief family-based cognitive-behavioral therapy session and care linkage telephone contacts in a sample of suicidal 10 to 18 year-olds and found the intervention to be feasible and that youths were significantly more likely to attend outpatient treatment and

obtain both psychotherapy and/or medication treatment (Asarnow et al., 2011; Hughes & Asarnow, 2013). However, they did not find that the ED intervention impacted clinical or functioning outcomes (Asarnow et al., 2011). A similar study using family-based crisis intervention by Wharff, Ginnis and Ross (2012) resulted in significantly less hospitalizations, while a study by Grupp-Phelan et al. (2012) looking at the effect of a motivational interview intervention found significant increase in post-ED MH appointment attendance. a study interested in 12 to 18 year old suicide attempters and their mothers found that a specialized ED intervention had an impact on depression scores, maternal emotional distress and family cohesion, especially in youth with initially high symptomatology (Rotheram-Borus, Piacentini, Cantwell, Belin, & Song, 2000).

Other researchers have sought to increase quality of care by addressing patient and family concerns around wait times, privacy, and crowding by configuring a separate ED unit for MH patients. One such study implemented a multidisciplinary MH team, created a calming, restful and more private environment and dedicated patient flow (Grover & Lee, 2013). A follow-up evaluation of this program showed decreased in LOS, security manhours, use of restraints and increased satisfaction. Another initiative explored outcomes related to the creation of a pediatric psychiatric intake response center within the ED and found similar rates of repeat visitors (21%) (Tossone, Jefferis, Bhatta, Bilge-johnson, & Seifert, 2014).

More generally, in order to ensure rapid, appropriate care and better clinical outcomes, it is recommended that ED physicians have greater MH training (Dawe, 2004; Santucci, Sather, & Baker, 2003); that EDs have adequate MH resources in the form of specialized teams or pediatric MH providers on-site (American Academy of Pediatrics & American College of Emergency

Physicians, 2006; Rogers et al., 2017); that assessment and brief interventions and rapid linkages to outpatient/inpatient services be provided within the ED (American Academy of Pediatrics & American College of Emergency Physicians, 2006); and that specific pathways protocols/guidelines for pediatric MH visits be developed in all EDs and based on available evidence (Leon et al., 2013).

To conclude, it is also believed that greater MH training, specialized pediatric ED teams and the development of interventions and pathways will reduce repeat ED visits. There appears to be evidence that some ED interventions have decreased future hospitalization (Wharff et al., 2012), reduced LOS (Grover & Lee, 2013; Sheridan et al., 2016; Uspal et al., 2016), helped manage youth in crisis (Grover & Lee, 2013; Sheridan et al., 2016; Uspal et al., 2016), and increased linkages and attendance to outpatient services (Asarnow, Baraff, Berk, Grob, Devich-Navarro, Suddath, Piacentini, Rotheram-Borus, Cohen, Tang, et al., 2011; Grupp-Phelan et al., 2012). Although ED clinical pathways and interdisciplinary teams has been shown to improve ED care for many physical conditions (Browne, Giles, McCaskill, Fasher, & Lam, 2001), there is currently insufficient evidence to establish whether they can reduce repeat MH visits in pediatric populations with MH concerns. The evidence supporting the effectiveness of ED interventions targeting frequent users (physical and psychiatric presentations) has been more clearly shown in adult samples: two systematic reviews demonstrated overall desired effects in reducing repeat visits (Althaus et al., 2011; Moe et al., 2017). Another review of psychiatric ED presentations in diverse samples (pediatric, adult and mixed) also revealed that crisis interventions significantly reduced hospitalizations, return ED visits, length of ED visit and cost (Hamm et al., 2010). Finally, Study II did not specifically investigated provider type, level of MH training, or the

protocols/pathways in place for MH patients. It is therefore suggested that future research add return visits as an outcome of interest when evaluating models of MH care in the ED.

Closing the Gap to Outpatient Services. Approximately 50 percent of youth presenting to the ED are not being followed by a MH provider (Asarnow, Baraff, Berk, Grob, Devich-Navarro, Suddath, Piacentini, Rotheram-Borus, Cohen, & Tang, 2011; Paula Cloutier et al., 2010; Gill et al., 2017; S. Liu, Ali, Rosychuk, & Newton, 2014). Studies examining risk factors for re-hospitalization showed increased likelihood of readmission in those without post-discharge services (Blader, 2004; Carlisle, Mamdani, Schachar, & To, 2012; James et al., 2010). Moreover, longer times to completed suicides following discharge were found in youth with a greater number of outpatient consultations (Vasiliadis, Ngamini-Ngui, & Lesage, 2015). Therefore, the last proposed solution has been to provide immediate linkages to appropriate outpatient services, especially in those not already connected with services, in order to decrease the need to return to the ED. The next section expands on examples of clinical pathways that have been developed in different samples to demonstrate the range of proposed solutions.

Greenfield, Hechtman and Tremblay (1995) evaluated a specialized outpatient service for adolescents with MH concerns which would accept referrals directly from the ED. The service was established in order to offer immediate, intensive and short- or long-term treatment to children in MH crises and results showed a significant decreased in hospitalizations and a trend towards decreased repeat ED visits (Greenfield et al., 1995). A follow-up study investigated a similar rapid-response outpatient model among suicidal adolescents and found that it decreased overall inpatient admissions and reduced suicidality to the same degree as hospitalization (Greenfield, Larson, Hechtman, Rousseau, & Platt, 2002).

In Australia, a rapid access, low intensity, cognitive-behavioural treatment delivered by phone was integrated within a general ED discharge plan to bridge the gap to more formal outpatient services (Bastiampillai et al., 2014; Bidargaddi et al., 2015). Results showed significant improvements in symptoms (depression and anxiety) and in functioning (work and social; Bastiampillai et al., 2014; Bidargaddi et al., 2015). Another Australian initiative has also looked at the implementation of a MH nurse practitioner outpatient service in the ED in order to reduce delays to MH interventions for adults without prior MH care (Wand, White, Patching, Dixon, & Green, 2012). Results showed decreased psychological distress and high satisfaction by patients and providers alike (Wand et al., 2012).

Many regions have also implemented mobile crisis teams in order to provide quicker access to care following ED discharge (Currier, Fisher, & Caine, 2010). One study found that 70 percent of discharged MH adult patients utilized the service, but it did not improve symptomatic and functional outcomes or reduce likelihood of a return ED visit (Currier et al., 2010). A systematic review of outpatient intervention focused on decreasing ED visits in adults with physical illnesses found them successful overall (Moe et al., 2017).

In brief, although some clinical care pathways have been developed to close the gap between community-based MH and ED care, especially for youth not already connected with services, not many of them have been evaluated in the child and adolescent population with MH concerns. In this thesis, prior and current use of MH services has consistently been associated with increased repeat ED visits (Leon et al., 2017). In fact, in Study II, only 28 percent of patients did not receive MH services within six months of their services. Moreover, the finding that post-hospitalization MH care decrease the likelihood of being re-admitted is not a universal

finding, other have found the opposite results (Carlisle et al., 2012). Again, this may be due to the appropriateness and compliance to these services. There is evidence that compliance with ED recommendations for MH follow-up are often related to prior experience with MH services (outpatient and inpatient) in youth and adult samples (Agyapong, Rogers, Machale, & Cotter, 2010; Bridge, Marcus, & Olfson, 2012). Decisions about level of aftercare by providers is also influenced by many factors; not only illness severity and prior service use, but also by race/ethnicity, custody status, availability of services, and provider type (Fontanella, Early, & Phillips, 2008). There is therefore inconclusive evidence in pediatric samples that closing the gap to outpatient services would eventually reduce MH ED visits, although this remains an area of future research.

5. Thesis Contribution

This thesis contributes to the growing literature on ED use in pediatric patients with mental illnesses and will be clinically useful to professionals working with repeat visitors. The identification of key factors could lead the development of best practices with this population by providing essential information to ED professionals and ED decision-makers.

Results from Study I and II emphasize the complexity around the decision of youth and families to utilize the ED to meet their MH needs. More specifically, Study I extended the literature by providing a systematic review of predictors of repeat visits, discussing the limitations of prior research, and making key recommendations for future investigations. Study II expanded the literature by being the first study to integrate data from medical records, interviews and questionnaires to investigate repeat ED visits. It is also the first study in this research area to include family factors and to use a theoretical model as a driver for variable selection.

More broadly, results from both studies emphasize the need to re-examine the role of the ED within the greater MH system. The *Moving on Mental Health* initiative has supported communities to collaborate across sectors to ensure seamless care that meets the health and MH needs of Ontario's children and youth. The ED, being an integral part of pediatric MH care, needs to deal more effectively with MH visitors and repeat visits.

6. Conclusion

This dissertation addressed some of the gaps in the research on pediatric MH repeat visits to the ED by reviewing the existing literature and exploring the contribution of family factors. Results showed that past and current MH service utilization by youth and their caregivers were significant predictors along with severity of symptoms. Future research should aim to improve the care of MH visitors and evaluate the impact on repeat ED visits. It is suggested that ED decision- and policy-makers re-examine the role of the ED within the greater MH system.

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Figure 1. Padgett & Brodsky's model of determinants of ED use

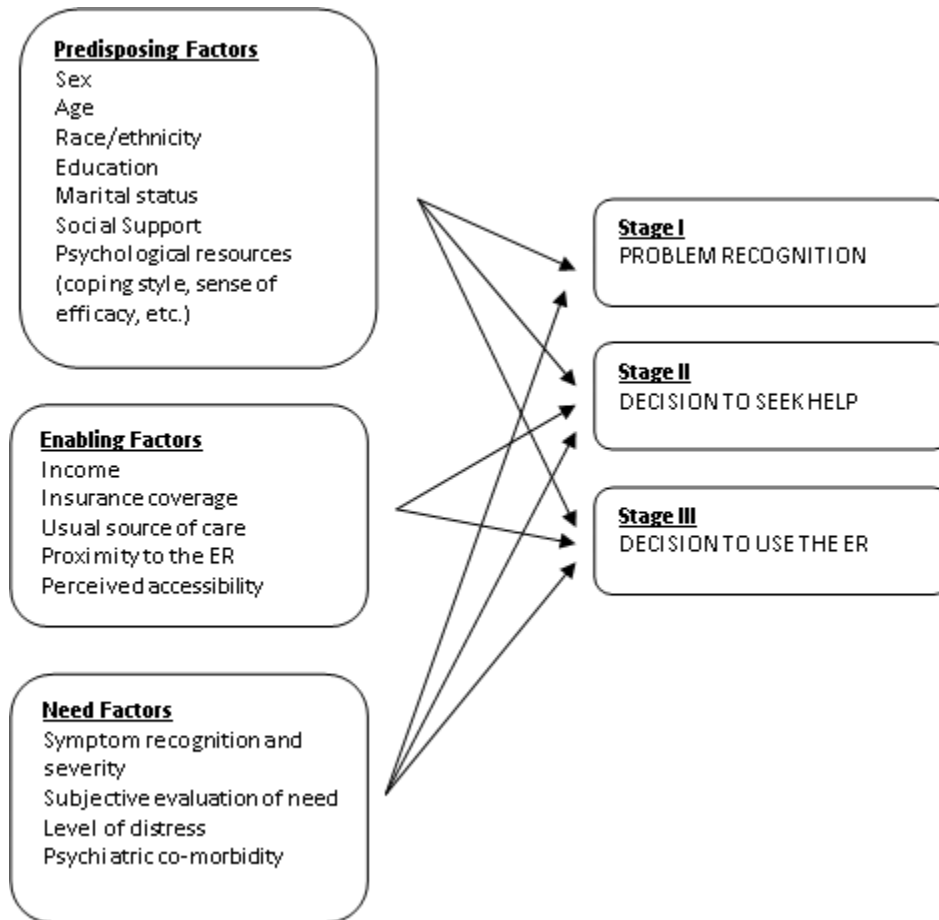


Figure 2. Flow chart Study I

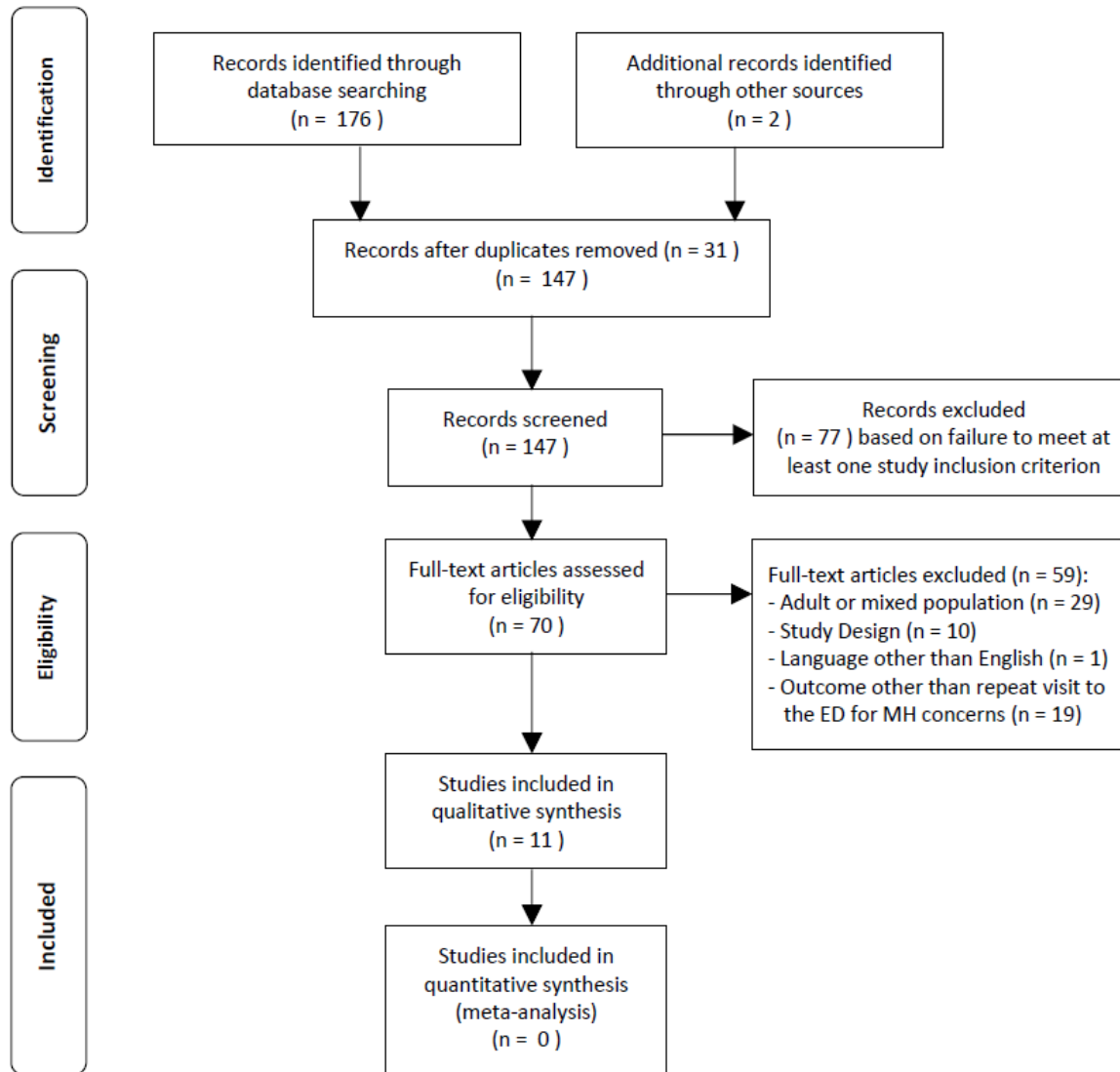


Figure 3. Demographic factors: Forest plot of adjusted ORs, HRs, and RRs of repeat visits

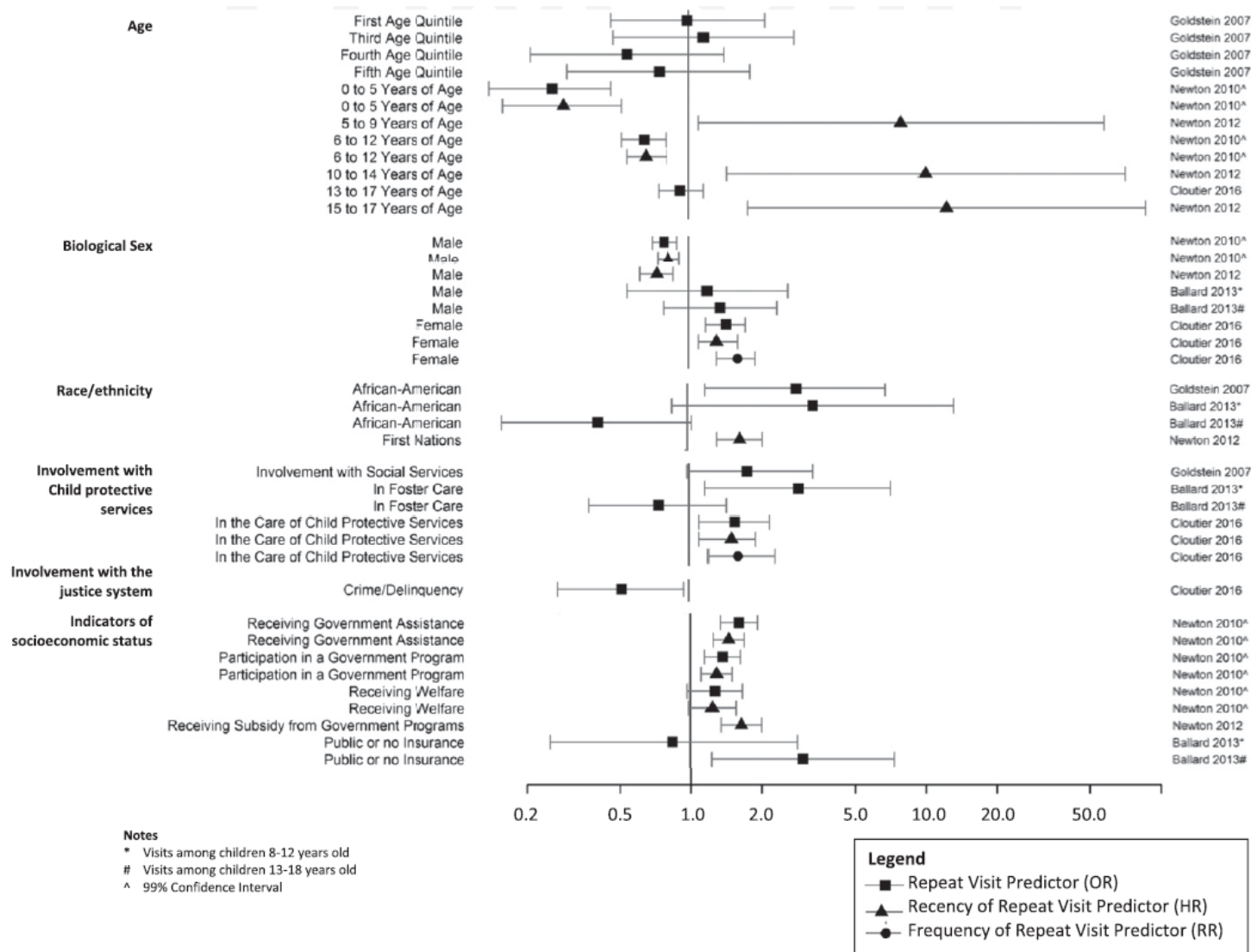
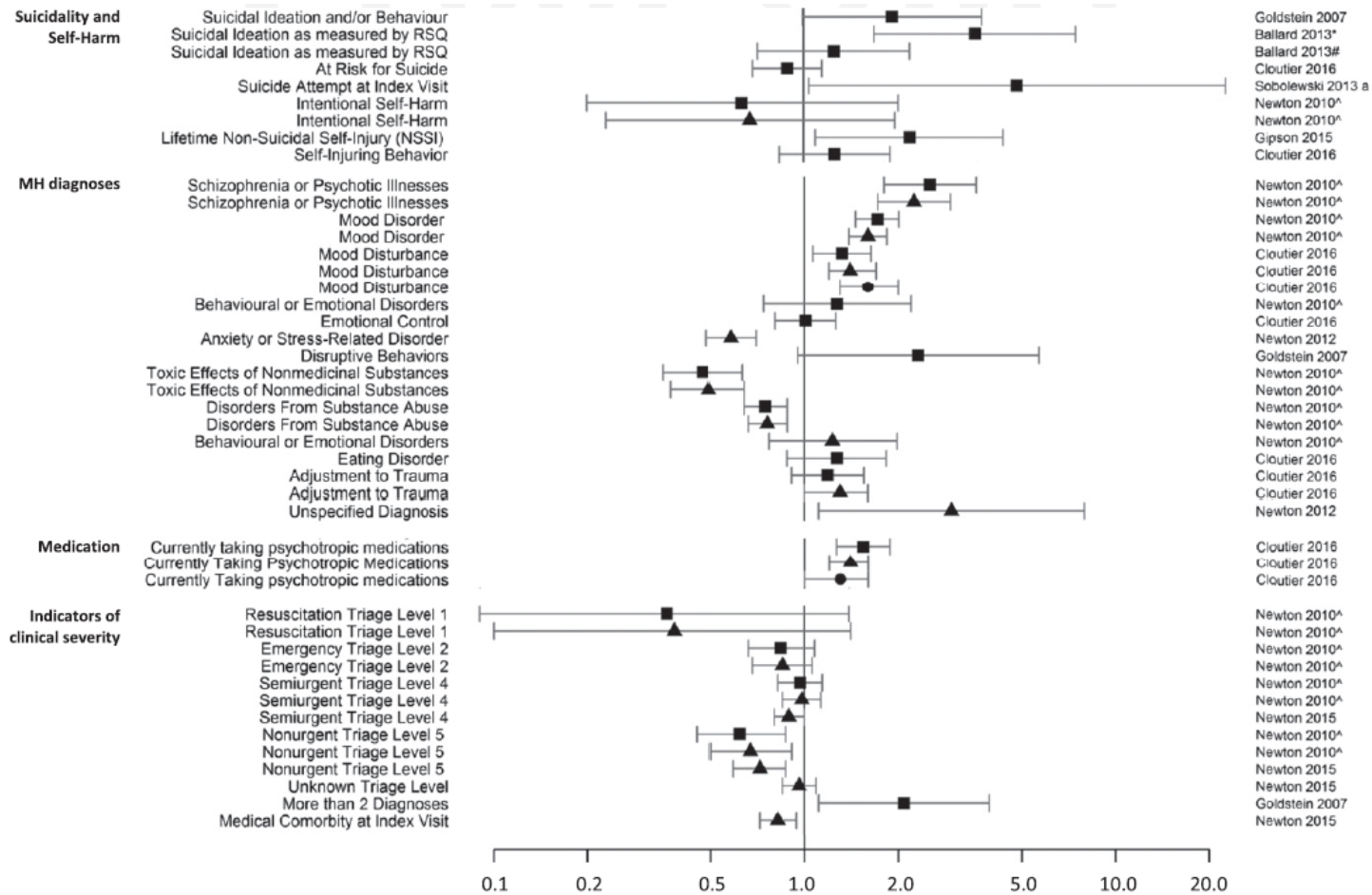


Figure 4. Clinical factors: Forest plot of adjusted ORs, HRs, and RRs of repeat visits



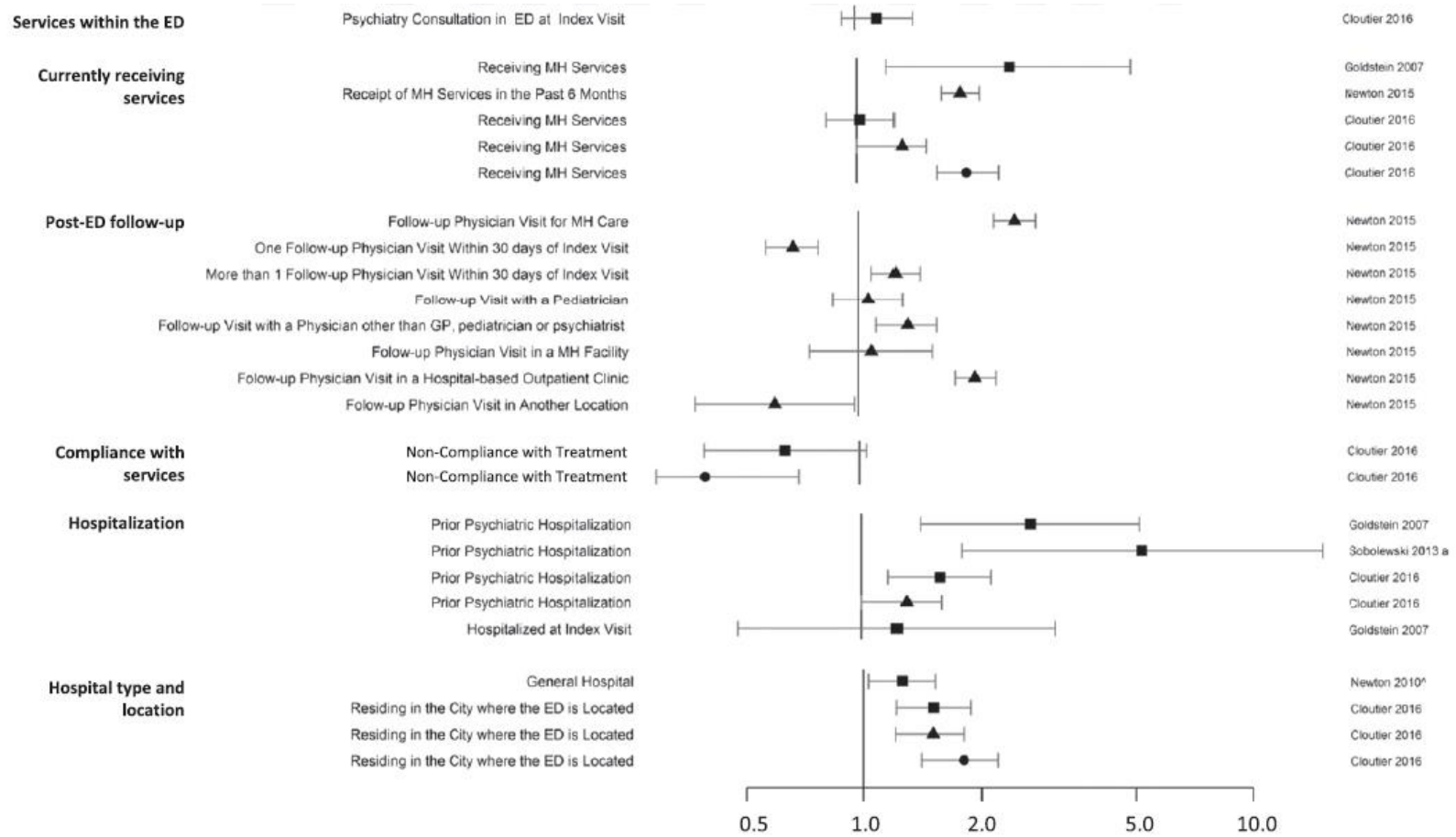
Notes

- a Sobolewski 2013 studied a sub-sample of youth presenting with suicidal behaviors at the index visit
- * Visits among children 8-12 years old
- # Visits among children 13-18 years old
- ^ 99% Confidence Interval

Legend

- Repeat Visit Predictor (OR)
- ▲ Recency of Repeat Visit Predictor (HR)
- Frequency of Repeat Visit Predictor (RR)

Figure 5. MH access and utilization: Forest plot of adjusted ORs, HRs, and RRs of repeat visits



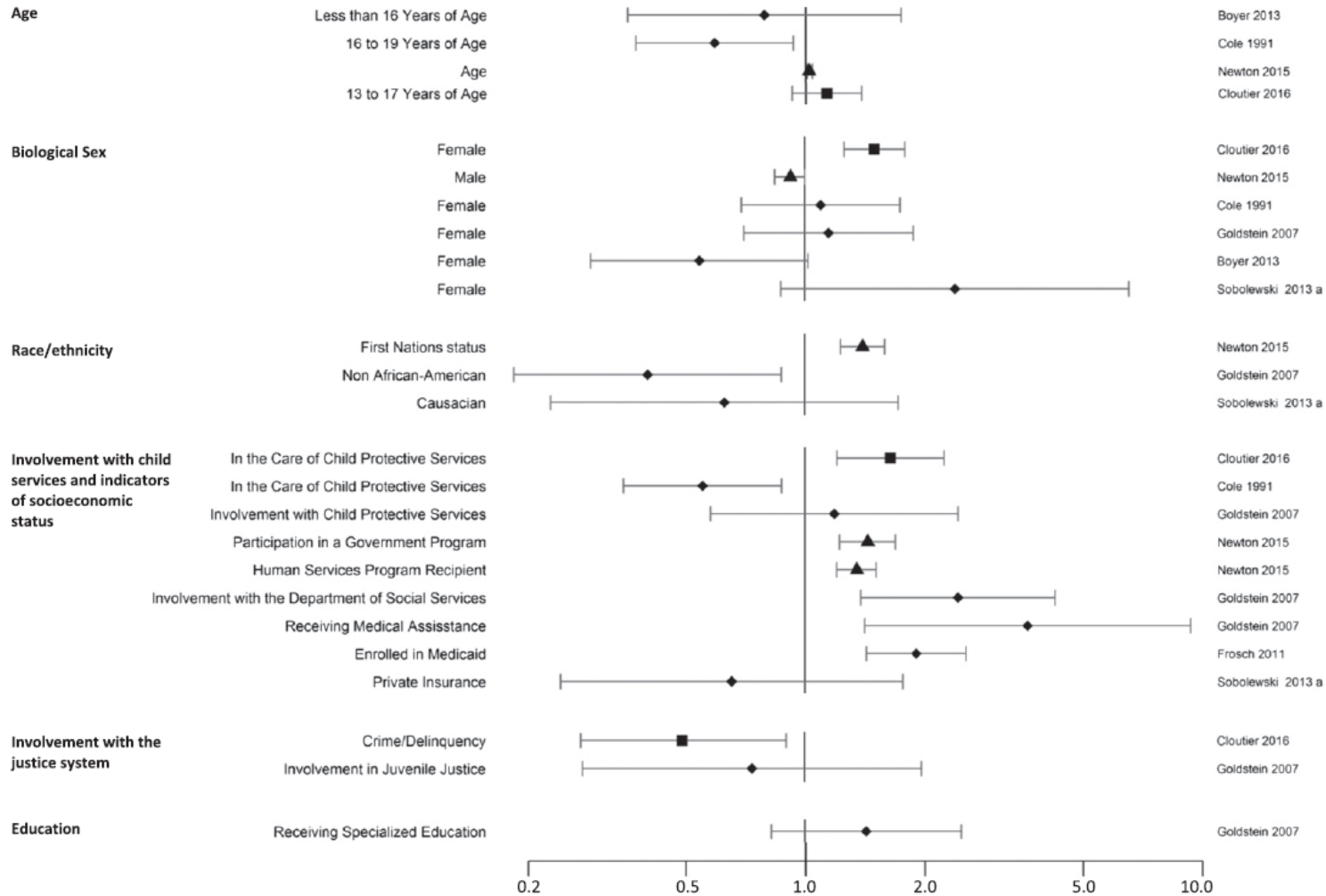
Notes

- a Sobolewski 2013 studied a sub-sample of youth presenting with suicidal behaviors at the index visit
- ^g 99% Confidence Interval

Legend

- Repeat Visit Predictor (OR)
- ▲ Recency of Repeat Visit Predictor (HR)
- Frequency of Repeat Visit Predictor (RR)

Figure 6. Demographic factors: Forest plot of unadjusted ORs, unadjusted HRs, and calculated ORs of repeat visits



Notes

a Sobolewski 2013 studied a sub-sample of youth presenting with suicidal behaviors at the index visit

Legend	■ Repeat Visit Predictor (OR)	▲ Recency of Repeat Visit Predictor (HR)	◆ Calculated Odds-Ratio (Cal.OR)
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Figure 7. Clinical factors: Forest plot of unadjusted ORs, unadjusted HRs, and calculated ORs of repeat

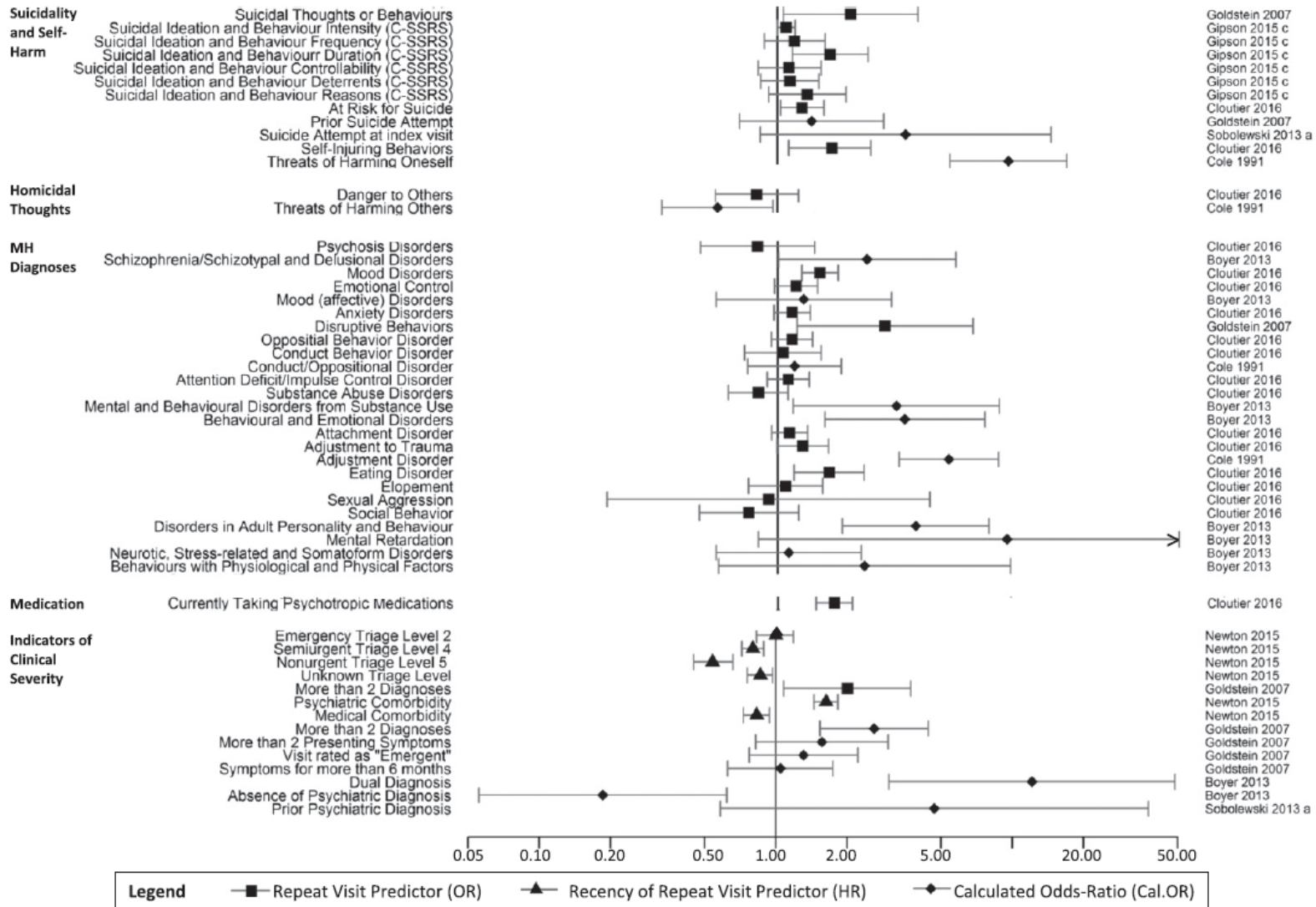
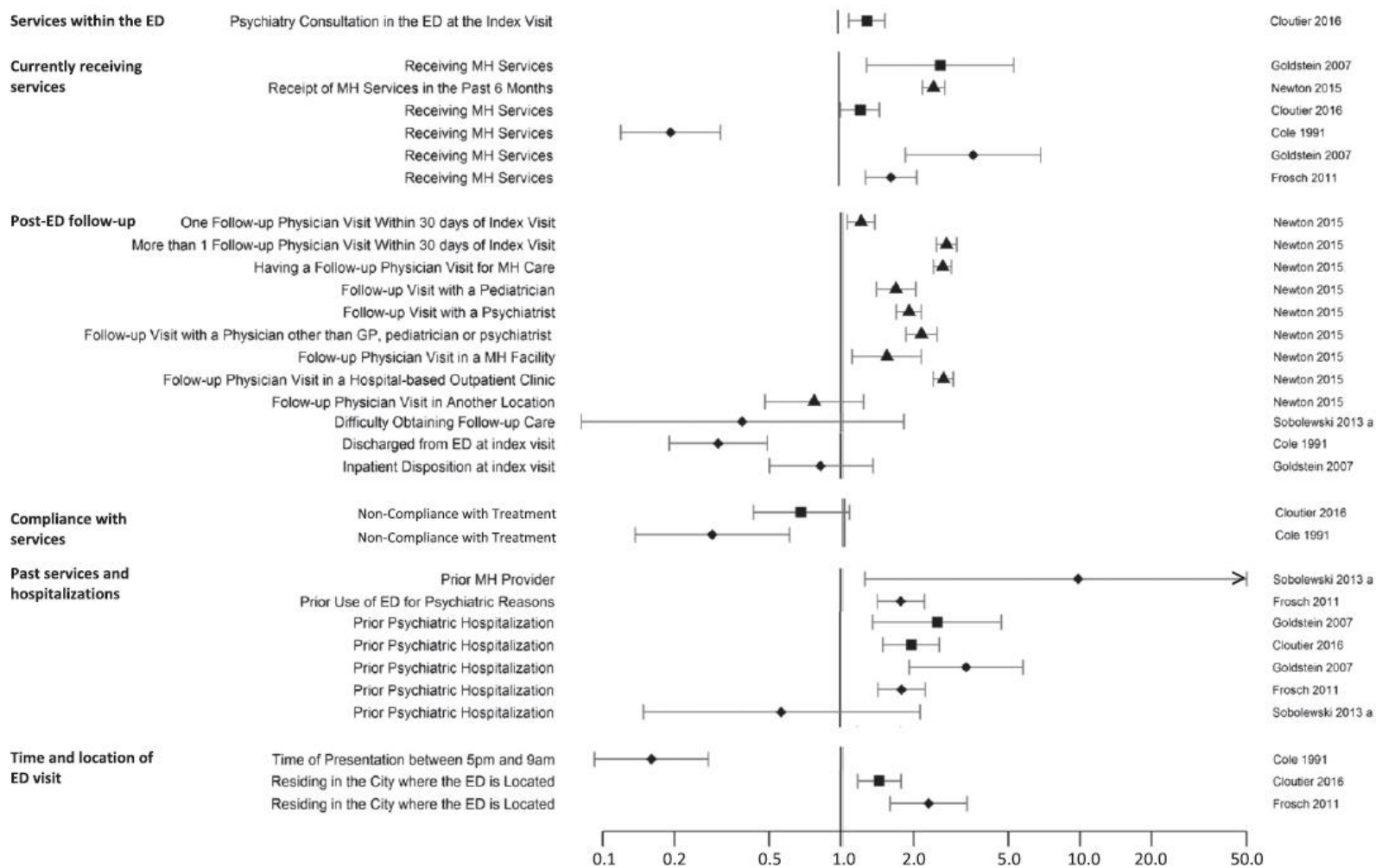


Figure 8. MH access and utilization: Forest plot of unadjusted ORs, unadjusted HRs, and calculated ORs of repeat



Notes

a Sobolewski 2013 studied a sub-sample of youth presenting with suicidal behaviors at the index visit

Legend	■ Repeat Visit Predictor (OR)	▲ Recency of Repeat Visit Predictor (HR)	◆ Calculated Odds-Ratio (Cal.OR)
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Figure 9. Overview of MH services in the Ottawa area



Figure 10. Flow chart Study II

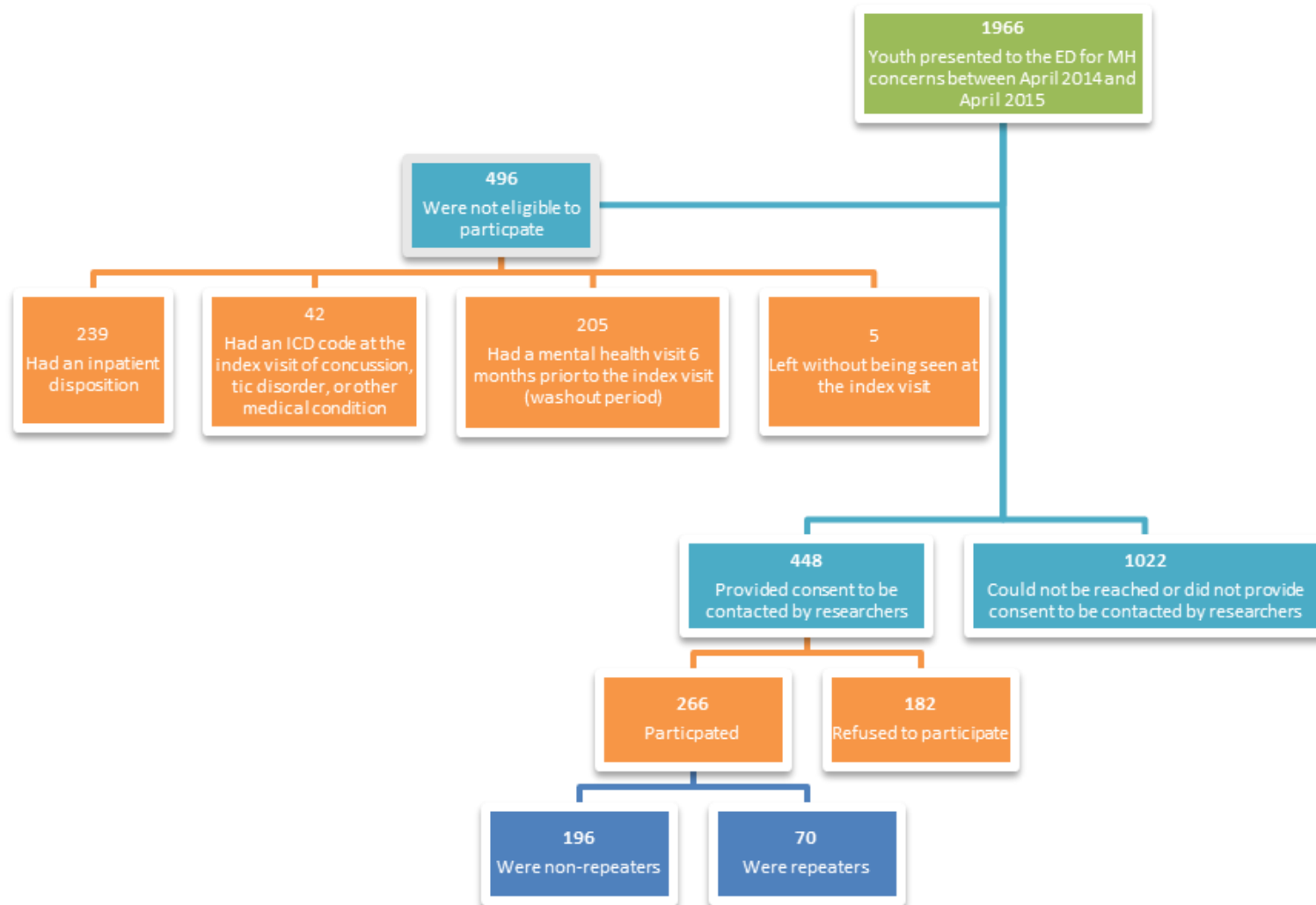


Figure 11. Time to the first repeat visit

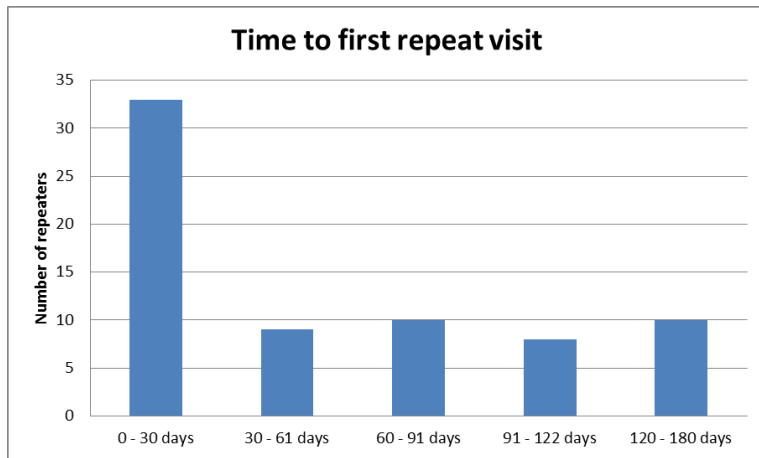


Figure 12. Number of repeat visits made by repeaters

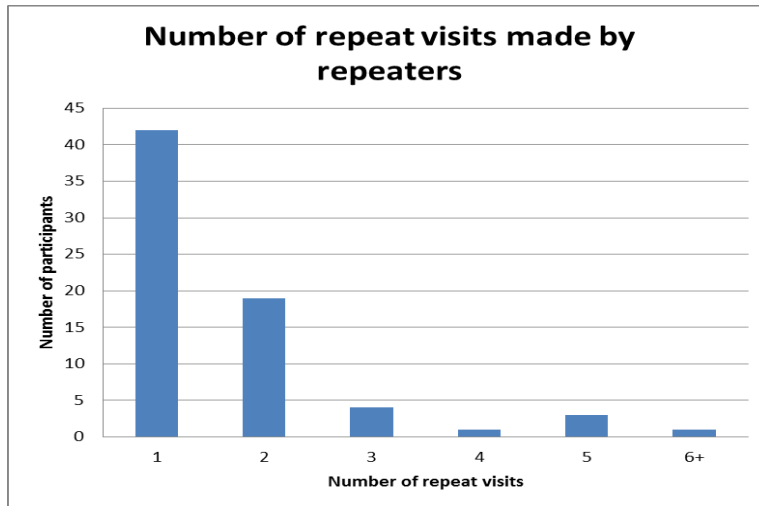


Table 1. Characteristics of included articles in Study I

	Article (first author, year of publication)	Recruitment Period and Location	Study objective	Sample	ED type	Return window	Statistical Test Used	Outcome
1	Cole, 1991<17>	Study length not reported Ottawa, Canada	To describe characteristics of repeat visits made by children and adolescent psychiatric patients	N= 319 %female: 63.0 Age range: 10-18 %repeat visitors: 42.9 Average repeat visits: 2.73	1 pediatric ED, urban	18 months	Chi-square (X2)	Repeat visitors (Y/N)
2	Goldstein et al., 2007<18>	Jul. 2003 to Jun. 2005 Baltimore, USA	To identify factors associated with returning to the ED	N= 417 %female: 45 Age range: 4-18 %Repeat visitors: 18.9 Average repeat visits: 2.37	1 urban pediatric ED, urban	6 months	Logistic Regression (OR) Chi-square (X2)	Repeat visit (Y/N) Repeat visitors (Y/N)
3	Newton et al., 2010<8>	Apr. 2002 to Mar. 2008 Alberta, Canada	To investigate predictors of ED return visits for pediatric MH care	N= 12,589 %female: 56.5 Age range: 0-17 %repeat visitors: 18.1	98 pediatric and non-pediatric EDs, mixed urban and rural	4 years	Logistic Regression (OR) Cox proportional	Repeat visit (Y/N) Recency of repeat visit

							hazards (HR)	
4	Frosch et al., 2011<14>	2002 to June 2009 Baltimore, USA	To identify for which patients the emergency care setting was repeatedly used	N= 2,903 %female: unknown Age range: 3-17 %repeat visitors: 12	1 pediatric ED, urban	6 months	Chi-square (X2)	Repeat visitors (Y/N)
5	Newton et al., 2012<19>	Oct. 2006 to Sep. 2007 Alberta, Canada	Examine whether sociodemograp hic differences exist in the rates of visits to EDs for MH care	N= 3,438 (all of which are repeat visitors) %female: not reported (58% in entire cohort of 20 956) Age range: 0-17	104 pediatric and non- pediatric EDs, mixed urban and rural	1 year	Cox proportional hazards (HR)	Recency of repeat visit
6	Ballard et al., 2013<20>	Sept 2007 to May 2008 Washington D.C., USA	To evaluate whether suicide screening items from the RSQ could predict repeated ED visits	N= 442 %female: 47 Age range: 8-18 %repeat visitors: 29	1 pediatric ED, urban	1 year	Logistic Regression (OR)	Repeat visit (Y/N)
7	Boyer et al., 2013<24>	January 1, 2001 to December 31, 2006	To describe demographic, clinical and management	N=264 children % female: 62.1 Age range 0-18 % Repeaters: 18.2	1 pediatric ED in a large urban public teaching	6 years	Chi-square (X2)	Repeat visitors (Y/N)

		Marseille, France	characteristics of children and adolescents admitted to the PED		hospital			
8	Sobolewski et al., 2013<21>	January 2010 to May 2010 Cincinnati, USA	To describe the need for subsequent urgent evaluation in the ED for suicidal adolescents discharged from the ED	N= 100 %female: 50 Age range: 11-18 %repeat visitors: 21	1 pediatric ED, urban and 1 pediatric ED, community	2 months	Logistic Regression (OR) Chi square (X2)	Repeat visit (Y/N) Repeat visitors (Y/N)
9	Gipson et al., 2015<22>	October 2009 to April 2010 Ann Arbor, USA	To examine predictors of future psychiatric emergency visits	N= 178 %female: 55.6 Age range: 13-17 %repeat visitors: 34.7	1 general hospital, urban	1 year	Logistic Regression (OR) Chi square (X2)	Repeat visit (Y/N) Repeat visitors (Y/N)
10	Newton et al, 2015<23>	April 2002 to Sept 2010 Alberta, Canada	Whether physician- based care after an ED visit for MH care predicted time to ED	N= 8075 (all of which are repeat visitors) %female: 62.7 Age range: 0-18	104 pediatric and non- pediatric EDs, mixed urban and rural	3 months	Cox proportional hazards (HR)	Recency of repeat visit

			return					
11	Cloutier et al., 2016<13>	Oct. 2006 to Dec. 2011 Ottawa, Canada	To examine characteristics of patients that predict repeat ED use	N= 2,900 %female: 56.7 Age range: 0-17 %repeat visitors: 23.8	1 pediatric ED, urban	5 years	Logistic Regression (OR) Cox Regression (HR) Negative Binomial Regression (RR)	Repeat visit (Y/N) Recency of repeat visit Frequency of repeat visit

Table 2. Descriptive and inferential statistics of repeaters and non-repeaters

Variable	Total Sample N = 266		Repeaters n = 70		Non-Repeaters n = 196		t- score/ χ^2	p-value
Demographic Factors								
Month of the index presentation, M (SD)	6.66	(4.10)	6.84	(3.97)	6.59	(4.15)	0.44	0.661
Age ¹ , M (SD)	13.41	(2.72)	13.83	(2.32)	13.27	(2.84)	1.64	0.104
Biological sex								
Female, n (%)	165	(62.00)	47	(28.50)	118	(71.50)	1.05	0.305
Neurodevelopmental co-morbidity								
Yes, n (%)	76	(28.60)	22	(28.90)	54	(71.10)	0.38	0.538
Average caregiver education								
Below university level education, n (%)	125	(50.60)	33	(50.80)	92	(50.50)	0.001	0.976
Missing	19	(7.10)	5	(7.10)	14	(7.10)		
Estimated median family income, M (SD)	82,195	(14,794)	84,072	(12,691)	81,525	(15,451)	1.24	0.217
Involvement with a child welfare agency ²								
Involved, n (%)	15	(5.70)	7	(10.00)	8	(4.10)	3.27	0.070
Missing	3	(1.10)	0	(0)	3	(1.50)		
Service Utilization Factors								
Estimated distance from the hospital ²								
Below 1 SD away from the mean (76.89 km), n (%)	233	(87.60)	66	(28.30)	167	(71.70)	3.91	0.048*
Length of Stay in the ED								
< 5.5h benchmark, n (%)	220	(90.90)	55	(25.00)	165	(75.00)	4.26	0.039*
Missing	24	(9.00)	5	(7.10)	19	(9.70)		
Satisfaction with services (CSQ), M (SD)	22.44	(6.78)	22.90	(6.26)	22.25	(6.96)	0.69	0.490
Missing	1	(0.40)	0	(0)	1	(0.50)		
Prior psychiatric hospitalization								
Yes, n (%)	25	(9.40)	11	(15.70)	14	(7.10)	4.45	0.035*
Receiving MH services within 6 months after the index visit								

Yes, n (%)	195	(73.30)	58	(82.90)	137	(69.90)	4.43	0.035*
Clinical Factors								
Severity (HEADS-ED), M (SD)	3.91	(2.01)	4.51	(2.06)	3.69	(1.96)	2.99	0.003**
Missing	4	(1.50)	0	(0)	4	(2.00)		
Perceived Severity (SDQ), M (SD)	19.51	(6.49)	19.72	(6.07)	19.43	(6.65)	0.27	0.789
Missing	75	(28.20)	20	(28.60)	55	(28.10)		
Diagnostic category, n (%)								
Anxiety disorders	141	(53.00)	38	(27.00)	103	(73.00)	0.06	0.803
Mood disorders ²	52	(19.50)	14	(26.90)	38	(73.10)	0.01	0.912
Behavioural disorders ²	29	(10.90)	9	(31.00)	20	(69.00)	0.37	0.541
Substance disorders ²	9	(3.40)	2	(22.20)	7	(77.80)	0.81	0.777
Eating disorders ²	3	(1.10)	0	(0)	3	(1.10)	1.08	0.298
Psychotic disorders ²	4	(1.50)	1	(25.00)	3	(75.00)	0.004	0.952
Other disorders ²	28	(10.50)	6	(21.40)	22	(78.60)	0.39	0.535
Suicidality								
Present, n (%)	135	(50.80)	42	(31.10)	93	(68.90)	3.25	0.071
Family Factors								
Caregiver history of treatment for MH concerns								
Present, n (%)	175	(68.40)	36	(52.20)	139	(74.30)	11.44	0.001**
Missing	10	(3.80)	1	(1.40)	9	(4.60)		
Perceived burden ²								
Quite a lot – A great deal, n (%)	132	(73.10)	37	(28.00)	95	(72.00)	0.30	0.584
Missing	84	(31.60)	21	(30.00)	63	(32.10)		
Family functioning	53.80	(8.62)	55.80	(9.15)	53.10	(8.33)	1.79	0.075
Missing	103	(38.70)	25	(35.70)	78	(39.80)		

Chi square tests were used to examine differences between frequencies (N)

Independent samples t-tests are reported for differences between means (M).

Missing N's for each group are reported separately.

* Significant at the 0.05 level; ** significant at the 0.01 level

¹ Equal variances not assumed

² Fisher's Exact Test used to correct for small sample size below 5.

Table 3. Predictors of repeat ED visits

	Unadjusted OR	95% CI	Adjusted OR	95% CI
Demographic Factors				
Age	1.083	0.974-1.204	1.054	0.912-1.218
Female	1.351	0.760-2.400	1.176	0.564-2.452
Having a neurodevelopmental co-morbidity	1.205	0.665-2.183	1.643	0.703-3.843
Estimated median family income	1.000	1.000-1.000		
Average caregiver education	1.013 ^a	0.575-1.785	1.026	0.515-2.043
Involvement with CAS	2.569 ^b	0.896-7.371	3.235	0.894-11.708
Service Utilization Factors				
Living closer to the hospital (below 1 SD)	2.865	0.970-8.467	5.965*	1.629-21.847
LOS above recommended 5.5h benchmark	2.500* ^c	1.024-6.106	1.074	0.347-3.320
Satisfaction (CSQ)	1.015 ^d	0.974-1.057	1.021	0.968-1.076
Receiving MH services within 6 months of index visit	2.082*	1.041-4.160	2.446*	1.054-5.677
Prior psychiatric hospitalization	2.424*	1.044-5.628	2.896*	1.003-8.361
Clinical Factors				
Having a mood-related ICD code at the index visit	1.039	0.524-2.061	0.841	0.371-1.904
Having a behaviour-related ICD code at the index visit	1.298	0.561-3.004	1.496	0.473-4.733
Having a psychosis-related ICD code at the index visit	0.932	0.095-9.114	2.907	0.228-37.059
Suicidality	1.661	0.954-2.892	1.456	0.717-2.958
Severity (HEADS-ED)	1.223* ^e	1.067-1.402	1.287*	1.082-1.532
Perceived Severity (SDQ)	1.007 ^f	0.958-1.058	0.978	0.911-1.050
Family Factors				
Caregiver history of treatment for MH concerns	0.377* ^g	0.212-0.670	0.271*	0.137-0.537
Perceived Family Functioning (FAM)	1.038 ^h	0.996-1.083	1.024	0.974-1.076
High level of perceived burden	1.233 ⁱ	0.581-2.616	1.167	0.484-2.810

N Adjusted = 266 non repeaters (79.2%) and 70 repeaters (20.8%) N unadjusted = 266 non repeaters (70 repeaters) unless otherwise specified. ^a= 247(65); ^b= 263(70); ^c= 242(65); ^d= 265(70); ^e= 262(70); ^f= 191(50); ^g= 256(69); ^h= 163(45); ⁱ= 182(49)

Table 4. Predictors of recency and frequency of repeat ED visits

	Recency of repeat visits N=266		Frequency of repeat visits N=266	
	Adjusted HR	95% CI	Adjusted RR	95% CI
Demographic Factors				
Age	1.070	0.948 – 1.061	1.049	0.936 – 1.175
Female	1.141	0.626 – 2.081	0.960	0.538 – 1.710
Having a neurodevelopmental co-morbidity	1.352	0.691 – 2.647	1.096	0.550 – 2.183
Average caregiver education	1.046	0.607 – 1.802	1.004	0.570 – 1.769
Involvement with CAS	2.126	0.779 – 5.799	2.597	0.971 – 6.946
Service Utilization Factors				
Living closer to the hospital (below 1 SD)	4.592 *	1.490 – 14.148	5.618 *	1.647 – 19.231
LOS above recommended 5.5h benchmark	0.980	0.426 – 2.258	0.909	0.395 – 2.093
Satisfaction (CSQ)	1.025	0.982 – 1.069	1.000	0.960 – 1.041
Receiving MH services within 6 months of index visit	2.266 *	1.124 – 4.571	2.056 *	1.046 – 4.041
Prior psychiatric hospitalization	1.819	0.815 – 4.059	2.342 *	1.024 – 5.356
Clinical Factors				
Having a mood-related ICD code at the index visit	0.950	0.499 – 1.811	0.620	0.313 – 1.226
Having a behaviour-related ICD code at the index visit	2.396	0.277 – 20.70	1.283	0.523 – 3.147
Having a psychosis-related ICD code at the index visit	1.928	0.766 – 4.851	1.462	0.137 – 15.653
Suicidality	1.377	0.787 – 2.410	1.983 *	1.132 – 3.474
Severity (HEADS-ED)	1.213 *	1.066 – 1.381	1.157 *	1.014 – 1.319
Perceived Severity (SDQ)	0.975	0.923 – 1.031	0.971	0.913 – 1.033
Family Factors				
Caregiver history of treatment for MH concerns	0.361 *	0.216 – 0.605	0.339 *	0.204 – 0.562
Perceived Family Functioning (FAM)	1.034	0.994 – 1.076	1.028	0.984 – 1.073
High level of perceived burden	1.332	0.637 – 2.788	1.695	0.772 – 3.721

Appendix A. Search strategies for PsycINFO, PubMed, and CINAHL

University of Ottawa Library

- **PsycINFO** - 1806 to January Week 1 2016

- 1 exp emergency services/
- 2 emergency department.mp.
- 3 emergency room.mp.
- 4 1 OR 2 OR 3
- 5 (return* OR repeat* OR revisit* OR recidivism OR c*me back).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
- 6 (child* OR adolescen* OR youth* OR teen*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
- 7 exp Mental Disorders/
- 8 psychiatric.mp.
- 9 7 OR 8
- 10 4 AND 5 AND 6 AND 9
- 11 Limit 10 to (English language and yr="1950 – current")

- **PubMed**

(((((emergency services) OR emergency department) OR emergency room)) AND (((return*) OR repeat*) OR revisit*) OR recidivism) OR c*me back)) AND (((child) OR children) OR adolescen*) OR youth*) OR teen*)) AND ((mental) OR psychiatric)

Limits:

Publication dates From 1950/01/01 to 2016/12/01

Languages English

- **CINAHL**

(((((emergency services) OR emergency department) OR emergency room)) AND (((return*) OR repeat*) OR revisit*) OR recidivism) OR c*me back)) AND (((child) OR children) OR adolescen*) OR youth*) OR teen*)) AND ((mental) OR psychiatric)

Limits:

Publication dates From 1950/01/01 to 2016/12/01

Languages English

Appendix B. List of eligible ICD-10-CM diagnosis codes

Category	Code	Descriptor
<i>Any code related to mental and behavioural disorders due to psychoactive substance use</i>	F10.-	Mental and behavioural disorders due to use of alcohol
	F11.-	Mental and behavioural disorders due to use of opioids
	F12.-	Mental and behavioural disorders due to use of cannabinoids
	F13.-	Mental and behavioural disorders due to use of sedatives or hypnotics
	F14.-	Mental and behavioural disorders due to use of cocaine
	F15.-	Mental and behavioural disorders due to use of other stimulants, including caffeine
	F16.-	Mental and behavioural disorders due to use of hallucinogens
	F17.-	Mental and behavioural disorders due to use of tobacco
	F18.-	Mental and behavioural disorders due to use to volatile solvents
F19.-	Mental and behavioural disorders due to multiple drug use and use of other psychoactive substances	
<i>Any code related to schizophrenia, schizotypal and delusional disorders</i>	F20.-	Schizophrenia
	F21.-	Schizotypal disorder
	F22.-	Persistent delusional disorders
	F23.-	Acute and transient psychotic disorders
	F24.-	Induced delusional disorder
	F25.-	Schizoaffective disorders
	F28.-	Other nonorganic psychotic disorders
F29.-	Unspecified nonorganic psychosis	
<i>Any code related to mood and affective disorders</i>	F30.-	Manic episode
	F31.-	Bipolar affective disorder
	F32.-	Depressive episode
	F33.-	Recurrent depressive disorder
	F34.-	Persistent mood [affective] disorders
	F38.-	Other mood [affective] disorders
F39.-	Unspecified mood [affective] disorder	
<i>Any code related to neurotic, stress-related and somatoform disorders</i>	F40.-	Phobic anxiety disorders
	F41.-	Other anxiety disorders
	F42.-	Obsessive-compulsive disorder
	F43.-	Reaction to severe stress, and adjustment disorders
	F44.-	Dissociative [conversion] disorders
	F45.-	Somatoform disorders
F48.-	Other neurotic disorders	
<i>Any code related to behavioural syndromes associated with</i>	F50.-	Eating disorders
	F51.-	Nonorganic sleep disorders
	F52.-	Sexual dysfunction, not caused by organic disorder or disease
	F53.-	Mental and behavioural disorders associated with the puerperium, not elsewhere classified
F54.-	Psychological and behavioural factors associated with disorders	

<i>physiological disturbances and physical factors</i>		or diseases classified elsewhere
	F55.-	Abuse of non-dependence-producing substances
	F59.-	Unspecified behavioural syndromes associated with physiological disturbances and physical factors
<i>Any code related to behavioural and emotional disorders with onset usually occurring in childhood and adolescence</i>	F90.-	Hyperkinetic disorder
	F91.-	Conduct disorders
	F92.-	Mixed disorders of conduct and emotions
	F93.-	Emotional disorders with onset specific to childhood
	F94.-	Disorders of social functioning with onset specific to childhood and adolescence
<i>Any code related to unspecified mental disorder</i>	F98.-	Other behavioural and emotional disorders with onset usually occurring in childhood and adolescence (e.g. enuresis, stuttering, etc.)
	F99.-	Mental disorder, not otherwise specified
<i>Any code related to intentional self-harm</i>	R45.89	Other symptoms and signs involving emotional state
	X71.- to X82.-	Intentional self-harm by xxx
<i>Any code related to a MH symptom</i>	R45.0	Nervousness
	R45.1	Restlessness and agitation
	R45.2	Unhappiness
	R45.3	Demoralization and apathy
	R45.4	Irritability and anger
	R45.5	Hostility
	R45.6	Violent behavior
	R45.7	State of emotional shock and stress, unspecified
	R45.81	Low self-esteem
	R45.82	Worries
	R45.83	Excessive crying of child, adolescent or adult
	R45.84	Anhedonia
	R45.85	Suicidal ideation
	R45.86	Emotional lability
	R45.87	Impulsiveness
R46.2	Strange and inexplicable behaviour	
R46.88	Other symptoms and signs involving appearance and behaviour	

Appendix C. List of non-eligible ICD-10- CM diagnosis codes

Category	Code	Descriptor	Reason
<i>Any code related to disorders of adult personality and behaviour</i>	F60	Specific personality disorders	There is some debate whether personality disorder can be reliably diagnosed in children and adolescent due to the fact that their personalities are still being formed. Furthermore, these codes are very uncommon in emergency visits.
	F61	Mixed and other personality disorders	
	F62	Enduring personality changes, not attributable to brain damage and disease	
	F63	Habit and impulse disorders	
	F64	Gender identity disorders	
	F65	Disorders of sexual preference	
	F66	Psychological and behavioural disorders associated with sexual development and orientation	
	F68	Other disorders of adult personality and behaviour	
<i>Any code strictly related to mental retardation</i>	F69	Unspecified disorder of adult personality and behaviour	Mental retardation by itself will not be considered a MH disorder. However if a youth comes with other MH problems (e.g. mood) and happens to also have mental retardation, the youth might be eligible.
	F70	Mild mental retardation	
	F71	Moderate mental retardation	
	F72	Severe mental retardation	
	F73	Profound mental retardation	
	F78	Other mental retardation	
<i>Any code related to disorders of psychological development</i>	F79	Unspecified mental retardation	Similarly, developmental disorders will not be considered a MH disorder. However if a youth comes with other MH problems (e.g. mood) and happens to also have a developmental disorder, the youth might be eligible.
	F80	Specific developmental disorders of speech and language	
	F81	Specific developmental disorders of scholastic skills	
	F82	Specific developmental disorder of motor function	
	F83	Mixed specific developmental disorder	
	F84	Pervasive developmental disorders	
	F88	Other disorders of psychological development	
<i>Any code strictly related to autism</i>	F89	Unspecified disorder of psychological development	Autism has a strong developmental and medical component so by itself the diagnosis of autism will be excluded. However if a
	F84.0	Childhood autism	

			youth comes with a MH problems (e.g. mood) and happens to also have autism, the youth might be eligible.
<i>Any code strictly related to tic disorders</i>	F95	Tic disorders	Tic disorders have a strong developmental and medical component so by itself the diagnosis will be excluded. However if a youth comes with a MH problems (e.g. mood) and happens to also have a tic disorder, the youth might be eligible.
<i>Any code related to post-concussional syndrome</i>	F07.81	Postconcussional syndrome	Codes related to acquired injuries will be excluded.

Appendix D. Summary of measures, data sources, and the constructs they aim to measure

<i>Padgett & Brodsky Factors</i>	Variable/ Construct	Measure / Data Source
<i>Demographic (predisposing) Factors</i>	Youth biological sex	Patient medical record
	Youth age	Patient medical record
	Caregiver education	Telephone interview
	Income	Statistics Canada Postal Code Conversion File
	Child welfare agency involvement	Patient medical record
	Neurodevelopmental co-morbidity	Patient medical record
<i>Service Utilization (enabling) Factors</i>	Estimated distance from the hospital	Patient's chart
	Length of stay in the ED	Patient's chart
	Service satisfaction	Client Satisfaction Questionnaire (CSQ-8)
	Receiving MH services within 6 months of index visit	Patient medical record The Services for Children and Adolescents - Parent Interview (SCA-PI)
	Prior hospitalization	Patient medical record The Services for Children and Adolescents - Parent Interview (SCA-PI)

<i>Clinical (need) Factors</i>	Symptom severity	HEADS-ED
	Perceived symptom severity	Strengths and Difficulties Questionnaire (SDQ)
	MH diagnosis at the index visit	Patient medical record
	Suicidality	Patient medical record

<i>Family Factors</i>	Perceived Parental Burden	Strengths and Difficulties Questionnaire (SDQ)
	Perceived Family functioning	Family Assessment Measure (FAM-III)
	Caregiver history of treatment for MH concerns	Telephone Interview

Appendix E. Detailed description and coding of study variables

Youth Age: Continuous variable referring to the age of the child/adolescent at the time of the index presentation. Age was calculated using the child/adolescent's date of birth as recorded on their medical chart.

Youth Biological sex: Dichotomous variable referring to the biological sex of the child/adolescent as recorded on their medical chart. Female sex was coded 0 (reference category), while male sex was coded 1.

Neurodevelopmental Co-Morbidity: Dichotomous variable referring to the presence of a neurodevelopmental disorder (ADHD, Autism disorder, Tourette syndrome, pervasive developmental disorder, etc.) as recorded on the child/adolescent's medical chart. The absence of a neurodevelopmental disorder was coded 0 (reference category), while a diagnosis was coded 1.

Estimated Income: Continuous variable referring to the median family income of the area covered by the postal code recorded on the child/adolescent's medical chart. Median family income by postal code is available from the Canadian 2011 National Household Survey (NHS).

Caregiver Education: Dichotomous variable referring to the average level of education of both primary caregivers. In the case of single parents (deceased partner or partner not involved in care since birth), the level of education of only one parent was considered. Level of educational attainment of each caregiver was elicited during the telephone interview and is therefore self-reported. Elementary education up to college education were coded 0 (reference category), while university level education (undergraduate and graduate) was coded 1.

History of Caregiver Treatment for MH Concerns: Dichotomous variable referring to at least one of the child/adolescent's caregiver having a past or current history of seeking MH care for

their own MH concerns (counselling, psychotherapy or psychotropic medication). Therapy received to solely manage child behaviour (parenting) or couple counselling was not included. No history of caregiver treatment for MH concerns was coded 0 (reference category), while a history of such treatment was coded 1.

CAS Involvement: Dichotomous variable referring to current involvement with the Children's Aid Society (CAS) as recorded on the child/adolescent's medical chart. It was exceptionally difficult to reach children currently in care, therefore this variable does not capture children in care, only families who are currently involved with CAS. No involvement was coded 0 (reference category), while indication of involvement was coded 1.

Estimated distance from the hospital: Continuous variable referring to the shortest travel distance between the ED and the participant's primary residence at the index visit. The participant's postal code as recorded on the index ED visit sheet was used. Shortest travel distance was calculated using Google Maps. "Proximity of the ED" was found to be highly skewed and therefore dichotomized using one standard deviation ($M= 36.01$, $SD = 40.87$) from the mean as the cut-off, which was approximately 77 kilometers; kms.

Length of Stay in the ED: Continuous variable referring to the difference between the index visit discharge time and the triage as recorded on in the medical chart. Three times are usually recorded on the ED visit sheet: time of triage (which is usually within a few minutes of arrival), time seen (by physician or crisis worker), and discharge time (which is the time patient is allowed to leave the ED).

Service satisfaction: Continuous variable referring to the total score on the CSQ which measured overall satisfaction with the services received at the index visit. The CSQ was administered during the telephone interview.

Receipt of MH services: Dichotomous variable referring to the receipt of therapy-based MH services from a psychologist, psychiatrist, social-worker, or physician within 6 months after the index visit. Information elicited during the telephone interview and questions were formulated based on the SCAP. Absence of any psychotherapy is coded 0 (reference category), while receipt of psychotherapy was coded 1.

Prior psychiatric hospitalization: Dichotomous variable referring to past hospitalization(s) for any psychiatric/ neurodevelopmental disorder at any hospital. Previous admissions to CHEO are available on the child/adolescent's medical chart. Hospitalizations to other hospitals was elicited during the telephone interview (questions based on the SCAP). Absence of any prior MH hospitalizations is coded 0 (reference category), while one or more prior hospitalization(s) is coded 1.

MH diagnosis: Primary ICD codes given at the index visit are available on the child/adolescent's medical chart. All ICD codes were combined into 7 categories: anxiety disorders, mood disorders, behavioural disorders, substance disorders, eating disorders, psychotic disorders, and other disorders. Dichotomous variables referring to each of these categories were created. An ICD code not falling into the category in question is coded as 0 (reference category), while an ICD code falling into the category in question is coded as 1. Based on results from the systematic review, a diagnosis of mood, behaviour, or psychosis-related illness were chosen as most likely to predict repeat visits.

Suicidality: Dichotomous variable referring to any mention in the patient's medical record of suicidal ideation, suicidal plan or suicidal action (attempt) at the index visit. Absence of suicidality is coded as 0 (reference category), while any mention of suicidal ideation, suicidal plan or suicidal action (attempt) is coded as 1. Self-harm behaviour (cutting, drug use) was not

included unless intent was clearly suicidal.

Symptom severity: Continuous variable referring to the total score on the HEADS-ED, a measure of severity. Completed HEADS-EDs (by a physician or crisis worker) was available for 55 percent of participants. Using ED visit information available in patients' medical charts, the rest of the HEADS-ED were completed by a rater blinded to study hypotheses (but not to repeater status). A second rater coded 53 percent of the HEADS-EDs in this sample using the same medical chart information. Interrater reliability was assessed using a two-way mixed, consistency, single-measure ICC (Hallgren 2012; Koo & Li, 2106) to determine the degree of coders' consistency in their rating of the HEADS-ED's 7 items. The resulting ICCs were in the moderate range (mean ICC = .712) indicating an acceptable degree of agreement and similar interrater reliability as previously reported for this measure (Cappelli et al., 2012).

Perceived symptom severity: Continuous variable referring to the total score on the SDQ, a measure of perceived MH difficulties. The measure was part of the questionnaire package.

Perceived Burden: Dichotomous variable referring to the perceived level of burden the child or adolescent's symptoms have on the family as a whole as measured by question number 34 on the SDQ: "Do the difficulties put a burden on you or the family as a whole?". Answers "Not at all" and "Only a little" were coded as 0 (reference category), while "A medium amount" and "A great deal" were coded as 1.

Family functioning: Continuous variable referring to the level of perceived family functioning as measured by the FAM-III. The measure was part of the questionnaire package.

Appendix F. Study II recruitment procedure

Step 1 - Determining study inclusion

All eligible patient files (youth who presented with MH concern to the ED between April 2014 and April 2015) will be manually reviewed by the research team to determine which youth meet study inclusion criteria. Those who do will be added to a list.

Step 2 - Recruitment

Recruitment Procedure for Patients Participating in Another Study. A study by Dr. Cappelli's team entitled "Meeting Child and Youth Mental Health Needs in the Emergency Department: Evaluation and Assessment for Discharge Planning via a Web-based HEADS-ED Application" will be recruiting patients visiting the ED between March 2015 until August 2015. To facilitate recruitment for this study and reduce participant burden, the method of recruitment and follow-up interview was modified for patients participating in the HEADS-ED research project.

During the HEADS-ED study, the participants will be contacted for a telephone interview. At the end of this interview, the research assistant will ask the participants if they accept to be contacted for another related research study.

Recruitment Procedure for Patients *not* Participating in Another Study.

I. A database of all MH visits to the ED will be requested (variables usually include: MRN, Name, DOB, Age, Registration Date, Registration Time, Discharge Disposition, Diagnosis Code, Diagnosis Code Description). Once it is received, patients meeting the exclusion criteria below will be removed from the list: Patients whose primary discharge diagnosis is not strictly MH (e.g. post-concussional syndrome, tic disorders) and

patients whose discharge disposition is hospitalization

II. Then, these variables will be removed from the database: DOB, Age, Registration Time, Discharge Disposition, Diagnosis Code, and Diagnosis Code Description. Therefore, only MRN, Name, Registration Date, and DOB will be kept.

III. Each patient will be given a 4-digit participant code following this pattern RVED-XXXX, where the Xs are numbers from 0001 to 2000. Therefore, the database (as of this step called Master Database) will include: MRN, Name, Registration Date, DOB and Participant Code. The Master Database will also be password protected.

IV. Next, medical charts will be pulled by someone from medical records using a list of MRNs prepared by the research team (only MRNs will be communicated to medical records).

V. Medical charts will be reviewed by the research team for the following exclusion criterion: having presented to the ED 6 months prior to the index ED visit. Patients are also excluded if no contact information is available (Address and/or Telephone numbers). The following information will be gathered: Address, Telephone numbers and “Presented with a parent” Yes or No.

VI. Then, three columns will be created in the Master Database to receive the information that will be gathered through the medical review: Address, Telephone numbers and Presented with a parent Y/N. ****Note that due to the number of patients and the limited capacity of medical records and the research team, chart review and entering contact information in the Master Database will be done on an ongoing basis.*

VII. Using the contact information from the Master Database, letters will be sent to all potential participants’ caregivers/legal guardians asking if they would be interested in

participating in a study. These envelopes will contain a letter signed by the head of the ED, Dr. Ken Farion, a response form, and a self-return prepaid envelope. ***Note that envelopes will be addressed to the parents of the child in children 6 to 15, but addressed to the youth directly in youth 16 to 18.* On the response form, potential participant's caregiver will have the option of ticking off a "YES I would like to be contacted" or a "NO I would not like to be contacted" box as well as the option to refuse the use of demographic information (age, gender, diagnosis) for the purpose of better describing eligible individuals. Envelopes with the eligible participant's name and address will be prepared by the research team. The envelopes will be then given to SUPPORT volunteers for them to mail out.

VIII. The research team will be receiving answers to these letters through the response forms or through the email provided in the letter. Eligible participants who decline to being contacted will be removed immediately from the Master Database; however a paper trail will be kept until the end of the recruitment period, at which time these will be shredded. Eligible participants who accept to be contacted will be highlighted and calls for the telephone interview will start within the week. **Note that some families might be more difficult to contact and it might take up to 1 month before the interview is conducted.* Once eligible participants consent to participate in the research study, then their MRN, Name, Registration Date, DOB and Participant Code will be removed from the Master Database and placed into the research study's main database where their interview and questionnaire data will also be stored.

IX. Two weeks to approximately one month after letters are mailed out by the SUPPORT volunteers, a list of potential participants who have not replied (containing only

Name, Age and Telephone numbers) will be sent to the SUPPORT volunteers.

Some youth present to the ED without a family member and may not wish to have their parent or caregiver aware of their ED visit. Youth whose caregivers were not documented as present (in person or through phone consultation) during the ED visit and who are of age to consent will be contacted by support volunteers by telephone only. The hospital number will be blocked and use the alternate telephone script in order to maintain patient confidentiality. No letters will be sent to these youth.

X. Once the SUPPORT volunteers receive this list, they will call all eligible participants and note whether the eligible patient's family has been reached, whether they consent to being contacted, their preferred telephone number and time to be contacted (in other words, the same information requested on the response form in the mailed letters).

XI. Once SUPPORT volunteers have tried to contact each family twice, they will send back the list to the research team. As with responses from the mailed letters, eligible participants who decline to being contacted will be removed immediately from the Master Database; however a paper trail will be kept until the end of the recruitment period, at which time these will be shredded. Eligible participants who accept to be contacted will be highlighted and contacted as soon as possible by the research team. For those who refused to participate and who consented to the use of their demographic information; sex, age and diagnosis at the index visit will be recorded to determine if differences between those who participated and those who declined to complete the study exist.

XII. Eligible participants, who were not reached by telephone, will be sent a second letter (see above for the procedure concerning mailed letters). Finally, eligible participants who do not respond to the second letter within approximately 2 months will be removed

from the Master Database. Furthermore, any eligible participant who has not completed the telephone interview before a full year has elapsed since the index visit will be excluded.

After this step, the Master Database will be empty.

Step 3- Follow-up telephone interview

Telephone Interview for Patients not Participating. All potential participants who have agreed to be contacted will be telephoned at their most convenient time. The study will be explained and potential participants will have the chance to ask questions. Finally, verbal consent from the parents (or consent from the youth him or herself if the youth was alone at the index visit and/or of age to consent) will be sought. If consent is received, the Client Satisfaction Questionnaire (CSQ-8; caregiver), a modified Services for Children and Adolescents - Parent Interview (SCA-PI) and demographic questions (caregiver) will be administered. The full telephone interview is expected to take approximately 15-20 minutes to complete. For patients whose caregivers were not present and do not give permission to talk to their caregiver, all questionnaires can be completed by the patient. At the end of the telephone interview, a list of MH resources will be provided to them.

Telephone Interview for Patients Participating in the HEAD-ED Study. All consented participants who have agreed to be contacted one month post ED visit will be telephoned. Since the CSQ-8 and the SCA-PI will have already been captured through the HEADS-ED study, these will be skipped and only the few demographics questions will be asked.

Step 4 - Data extraction from patient files

After consent has been obtained on the telephone, the research team will go back to the charts of patients who have agreed to participate to extract the following information: demographics (age & sex), clinical (diagnosis, suicidality, etc.) and organizational variables

(wait time in the ED).

Step 5 - Mailing/emailing questionnaires

In the meantime, families who have completed the telephone interview will be mailed or emailed (whichever is more convenient for them) a questionnaire package which will include the Strengths and Difficulties Questionnaire (SDQ; caregiver only; 5 minutes to complete), and the Family Assessment Measure (FAM-III; youth 10+ and caregiver; 15 minutes each to complete). The package will also include a copy of the consent forms, a pre-paid return envelope for mailed packages and a list of resources families and patients can access. Emailed packages will be done through a safe data collection tool available at CHEO called RedCap. Again, in the event that the youth presented to the ED alone on the index visit, all questionnaires will be completed by the youth. For patients whose caregivers were not present and do not give permission to talk to their caregiver, they will only have the option of being emailed the questionnaires. As of September 2015, to increase completion of the online or mailed questionnaires, a 10\$ gift card to a store of the participant's choice (Tim Hortons, Starbucks or Chapters/Indigo) will be sent by mail. The participants will be notified of this incentive at the end of the telephone interview.

Appendix G. Description of measures used in Study II

The measures used in this study were chosen based on the following criteria: (1) brevity and ease of administration; (2) established and sound psychometric properties; (3) availability in French; and (4) low cost.

Client Satisfaction Questionnaire (CSQ-8; Attkisson & Greenfield, 2004). The CSQ-8 is comprised of 8 questions and was designed as a global measure of a patient's' satisfaction with health care services received as reported by caregivers or youth. CSQ-8 has been used in MH clinics that deal with a wide range of psychopathology, has established psychometric properties (Cronbach's $\alpha=.93$), and is used extensively in evaluation studies (Attkisson & Zwick, 1982; LeVois & Nguyen, 1981). This questionnaire will be administered verbally during the phone interview. A French version is available.

Demographic Questionnaire. The Demographic Questionnaire was developed by our research team to capture relevant demographic characteristics (e.g. parental education). This questionnaire was used during the phone interview along with questions from the Services for Children and Adolescents - Parent Interview (see below).

The Services for Children and Adolescents - Parent Interview (SCA-PI; Jensen et al., 2004). The SCA-PI was designed to assess caregivers' reports of youths' MH services received across multiple settings, as well as medication use. It was designed for use in clinical research since it can assess discrete units of service and is flexible in reporting on service use over different time periods. For the purpose of this study, only services and medication received for MH issues will be asked. The SCA-PI has good reliability, test-retest κ values range from .49 to 1.00 with an overall value of .97. Seventy percent of service types had κ values over .75

(Hoagwood et al., 2004). The measure was found to have good face validity as appropriate differences in service reporting were found between an ADHD treatment group and a control group (Jensen et al., 2004). The SCA-PI will be re-administered during the phone interview will to determine adherence to clinical recommendations as well as other service use such as visits to other EDs. This questionnaire will be administered verbally during the phone interview.

Initials of Interviewer: _____ ID# RVED- _____
Date of the Interview: _____ dd/mm/yy

Telephone Interview – Script, Questions and Record Sheet

To complete prior to the telephone call:

Date(s) of admission (DD/MM/YY) _____

Completed by:

- Mother Father Adolescent (if presented to the ED alone)
 Other caregiver (please specify : _____)

Interviewer: Hello, my name is _____. I am calling from CHEO because you said you may be interested in participating in a research study aimed to better understand those families and youth who return to the Emergency Department for mental health reasons.

This study aims to improve the emergency mental health services for all youth who come to CHEO. The study includes a 10-20 min telephone interview and some questionnaires to fill out on your own time. Your answers are confidential and your name will not appear in any report or publication. We are interested in your honest opinion both positive and negative. Your answers, whether positive or negative, will not affect any future services you/your child will receive at CHEO.

Do you (still) wish to participate?

- Yes No

Answer any questions the participant may have

Do you have a few minutes now to answer questions?

If "No" when would be a good time to call back? _____

If "yes", continue the interview

Interviewer: Before we begin, I would like you to know that I am not a clinical member of the CHEO Emergency Department.

First, I would like to ask a few questions about your satisfaction of the services you/your child received during your/your child' emergency visit on [date of index ED visit].

A) Interviewer will ask questions from the CSQ-8 regarding satisfaction of the index ED visit.

Initials of Interviewer: _____
Date of the Interview: _____ dd/mm/yy

ID# RVED- _____

B) Interviewer will proceed to questions concerning usual source of care.

1) Before the emergency visit on [date of index ED visit], was your child seeing a professional for his/her emotional or behavioural difficulties?

- General practionner
- Walk-in clinic
- Psychologist
- Psychiatrist
- Other mental health professional (school counsellor, social, etc.)
- No one

C) Interviewer will proceed to questions on recommendations.

Interviewer: I would now like to ask you a few questions regarding the recommendations/referrals given to you and [child] on [date of index ED visit]

1) Were you given any recommendations/referrals for follow-up care?

- Yes No

What were the recommendations?

- 1- _____
- 2- _____
- 3- _____
- 4- _____

- Recalls being given recommendations but cannot remember ANY
- Recalls being given other recommendations, but cannot recall what they were

1-
Did you take any action related to this recommendation?

- Yes No

If you did follow-up, were you able to obtain the recommended service?

- Yes No

Are you on a wait-list

- Yes No

Ask the same question for recommendation 2- to 4-.

Initials of Interviewer: _____
Date of the Interview: _____ dd/mm/yy

ID# RVED- _____

D) Interviewer will proceed to questions derived from the SCA-PI

- 1) Since the ED visit, has [child] received [any] counselling, therapy, family therapy or in-home case management?
 Yes No

What was the main reason for receiving this service the same or similar behavioral or emotional difficulties for which [child] presented to the emergency department?
 Yes No

If yes, ask:
When did this help first begin? [__ / __ / __] (mm/dd/yy)

Do you plan to have [child] continue?
 Yes No

- 2) Has [child] received any other counseling, therapy, or management?
• If yes, repeat questions
• If no, continue

- 3) Since the ED visit, has [child] stayed overnight at the hospital because of: attentional, learning, emotional, or behavioural difficulties OR been removed from the home overnight for these reasons?
 Yes No

The kind of situations that might be included in this question would be:

- Psychiatric hospital or
- Psychiatric wing of general hospital

The placement can be voluntary or ordered by a court, other law enforcement or social services agency.

Was the main reason of this stay for the same attentional, learning, emotional, or behavioural difficulties as why [child] presented to the emergency department?

If yes,
When was [child] admitted [__ / __ / __] (mm/dd/yy)

Initials of Interviewer: _____
Date of the Interview: _____ dd/mm/yy

ID# RVED-_____

- 4) Has [child] ever stayed overnight anywhere else because of attentional, learning, emotional or behavioural difficulties?
 Yes No

Was the main reason of this stay for the same attentional, learning, emotional, or behavioural difficulties as why [child] presented to the emergency department?

If yes,

When was [child] admitted [__/__/__] (mm/dd/yy)

- 5) Have you or your partner ever received [any] counseling or therapy for your own difficulties?
 Yes No

Have you or your partner ever received [any] medication for emotional or behavioural difficulties?
 Yes No

Highest educational degree obtained by you and your partner?

Mom Dad

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Elementary school |
| <input type="checkbox"/> | <input type="checkbox"/> | Secondary (high) school graduation certificate or equivalent |
| <input type="checkbox"/> | <input type="checkbox"/> | Diploma or certificate from community college |
| <input type="checkbox"/> | <input type="checkbox"/> | Bachelor's or undergraduate degree(s) (e.g., B.A., B.Sc., LL.B.) |
| <input type="checkbox"/> | <input type="checkbox"/> | Master's degree(s) including certificate/diploma (e.g., M.A., M.Sc., M.Ed.) & Doctorate (e.g., Ph.D., D.Sc., D.Ed.) |

Would you prefer an online or mailed questionnaires: Online Mailed

If your child is 10 yo or older, there will also be a short questionnaire for him or her.

Comments?

Family Assessment Measure (FAM-III; Skinner, Steinhauer & Sitarenios, 2000). The FAM-III is a self-report questionnaire based on the Process Model of Family Functioning and was developed using a construct validation paradigm. The FAM-III was designed to assess family strengths and problem areas. All statements are in the 4 Likert-type response format. The General scale is comprised of 50 statements which focus on the family from the systems' perspective (e.g. "We never let things pile up until they are more than we can handle.") Similarly, the Dyadic Relationships scale is comprised of 42 statements which focus on dyads within the family (e.g. "This person gives me a chance to explain when I make a mistake.") Finally, the Self-Rating scale is comprised of 42 statements which focus on the individual's perception of his family's functioning (e.g. "I know I can count on the rest of my family.") Depending on which scales are administered, the FAM-III is commonly completed within 20 to 45 minutes and can be administered with children as young as 10 years old. The norms for the FAM-III were obtained from non-problem families, but norms for clinical populations are also available. Reported alpha values are high: ranging from .93 to .94 for the general scale, from .94 to .95 for the dyadic relationships and from .86 to .89 for the Self-rating scale. Test-retest reliability was acceptable: .57 for mothers, .56 for fathers, and .66 for children. The FAM-III can also reliably distinguish 'problem' families (drug dependency, violence, trauma) from 'non-problem' families, lending support for the discriminant validity of the FAM-III measure. In terms of construct validity, the FAM-III correlates highly with the MMPI subscale of family problems. Finally, the FAM-III has also been found to have clinical validity, as evidenced by the ability of the FAM-III to monitor family functioning across sessions. A French translation is available.

HEADS-ED (Cappelli et al. 2012). The HEADS-ED is a rapid MH screening tool used

in the ED setting. The tool contains 7 items (Home, Education, Activities and peers, Drugs and alcohol, Suicidality, Emotions and behaviors, Discharge resources) with an embedded scoring system and points associated for each variable (0 = no clinical action needed; 1 = needs clinical action but not immediately; and 2 = needs immediate clinical action). The HEADS-ED also includes discharge resources; providing structure and guidance through the assessment/screening process. The HEADS-ED has good interrater reliability, .79, and can predict psychiatric consult and admission with 82 percent sensitivity and 87 percent specificity (Cappelli 2012). This information is collected as part of the regular ED assessment and will be available in patient charts.

	0 No action needed	1 Needs action but not immediate	2 Needs immediate action
H ome Sample questions	<input type="radio"/> Supportive	<input type="radio"/> Conflicts	<input type="radio"/> Chaotic/Dysfunctional
E ducation Sample questions	<input type="radio"/> On track	<input type="radio"/> Grades dropping / absenteeism	<input type="radio"/> Failing / not attending school
A ctivities and peers Sample questions	<input type="radio"/> No change	<input type="radio"/> Reduced / peer conflicts	<input type="radio"/> Fully withdrawn / significant peer conflicts
D rugs and alcohol Sample questions	<input type="radio"/> No or infrequent	<input type="radio"/> Occasional	<input type="radio"/> Frequent/daily
S uicidality Sample questions	<input type="radio"/> No thoughts	<input type="radio"/> Ideation	<input type="radio"/> Plan or gesture
E motions, behaviours, thought disturbance Sample questions	<input type="radio"/> Mildly anxious / sad / acting out	<input type="radio"/> Moderately anxious / sad / acting out	<input type="radio"/> Significantly distressed / unable to function / out of control / bizarre thoughts
D ischarge resources Sample questions	<input type="radio"/> Ongoing / well connected	<input type="radio"/> Some / not meeting needs	<input type="radio"/> None / on wait list / non-compliant

Strengths and Difficulty Questionnaire (SDQ; Goodman et al., 1997). The Strengths and Difficulties Questionnaire –Parental Rating (SDQ) is a brief 25-item behavioural screening questionnaire for children and adolescents. The 25 items measure the following scales: emotional

symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and prosocial behaviour which are added together to generate a total difficulty score. An impact supplement of 8 questions determines whether the caregiver believes the youth has a problem and determine chronicity, distress, social impairment, and burden to others (Goodman et al. 1999). Reliability was good with an internal consistency of .73, cross-informant correlation of .34 and test-retest of .62 (Goodman et al. 2001). Furthermore, validity of the burden rating was good as shown by a correlation of .74 with a standardized interview rating of burden (Goodman et al. 1999). Therefore the first 25 items will be used to measure perceived severity of symptoms while the supplemental questions will be used to determine perceived family burden. This questionnaire is also available in French.