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Predictors of Re-Accessing Mental Health Services for Children and Adolescents

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Abstract

The natural history of mental health disorders suggests that a substantial number of children experience persistent or recurrent problems and may need more than 1 episode of care. However, there is a paucity of research on recurrent service use. The present study examined the rates and predictors of re-accessing community-based care. Secondary data analyses were conducted on administrative and chart review data from 5 mental health agencies in southwest, eastern, and central Ontario. Approximately a third (30%) of children who had an episode of care re-accessed services again within 4 years; the median time to re-access was 13 months. Social content, social support system, illness career, and treatment system variables predicted re-accessing and time to re-access services; although there was some inconsistency in predictors across samples. A better understanding of the factors that influence recurrent service use may help mental health agencies better prepare for and facilitate this process for families.

Keywords: Children, adolescent, mental health, mental health service use, recurrent service use, re-accessing services, episodes of care, Ontario

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List of Abbreviations

BCFPI	Brief Child and Family Phone Interview
CAMH	Child and Adolescent Mental Health
CAFAS	Child and Adolescent Functional Assessment Scale
CANS	Child and Adolescent Needs and Strengths
CFA	Confirmatory Factor Analysis
EFA	Exploratory Factor Analyses
FSA	Forward Sortation Area
HR	Hazards Ratio
ICC	Intraclass Correlation Coefficient
MANOVA	Multivariate Analysis of Variance
MCYS	Ministry of Children and Youth Services
OR	Odds Ratio
PAF	Principal Axis Factoring
SD	Standard Deviation
SES	Socio-Economic Status

Chapter 1: Introduction

It is estimated that 20% of children have mental health problems and experience significant distress and impairment (Merikangas et al., 2011). Mental health problems remit for some children; that is children become asymptomatic or experience minimal symptoms (Schraeder & Reid, 2017). However, a substantial number of children experience persistent (i.e., continued) or recurrent (i.e., new episode) problems. For example, over 40% of children with attention-deficit/hyperactivity disorder continue to meet criteria as adolescents (Bussing, Mason, Bell, Porter, & Garvan, 2010), and 50% to 70% of children with depression experience a recurrence (Schraeder & Reid, 2016).

When a child has an episode of illness, it can result in an episode of care. A series of episodes of care creates a pattern of care. The pattern of care is a function of the structure of the mental health system (i.e., providing services for a limited period of time) and families' help-seeking behaviors (i.e., during periods of need; Sytema, Giel, & ten Horn, 1989). Several studies have examined patterns of care, including the percentage of individuals who have more than one episode of care (i.e., re-access services). These findings will be briefly reviewed.

1.1. Patterns of Care and Re-Accessing Services

Reid and colleagues (2015) examined service use across 3 agencies in Ontario that provide child and adolescent mental health (CAMH) services. The authors analyzed administrative mental health visit data for children between 4 and 11 years of age at the time of their first visit (N = 5206) and found that 19.2% of children had a second episode of care within a 5-year period. The second episode of care was characterized by an average of 21.2 visits and lasted on average 7 months. Note than an episode of care was defined as a minimum of 3 visits with a period of 180 days without visits between episodes (Reid et al., 2015).

Farmer and colleagues (1999) examined service use across different sectors, including education, specialty mental health, medical, juvenile justice, and child welfare. The authors analyzed data from the first year of the Great Smoky Mountains Study (N = 1007), a longitudinal epidemiological study conducted in rural regions of southeastern United States. Participants were 9, 11, or 13 years old at baseline. The authors found that 21.1% of children received services from any sector, and only 8% received services from the specialty mental health sector. Of the children who received any type of service that year, 68.1% reported prior service use during their lifetime. Thus, it appears that a substantial number of families seek services on more than one occasion. No further information was provided on recurrent service use.

Yampolskaya and colleagues (2013) studied service use at a residential mental health center for children in Florida. The authors examined administrative data of children (mean age = 13.83 years, SD = 2.32) admitted between 2004 and 2008 (N = 1432). The authors found that 19% of children were re-admitted during the 4-year study period, and 10% were re-admitted within one year of discharge (Yampolskaya et al., 2013). Other studies have found higher one-year readmission rates to psychiatric inpatient services: 26% by Lakin, Brambila, and Sigda (2008), 34% by Blader (2004), and 38% by Fontanella (2008).

The limited data on mental health service use suggests that a substantial number of children access specialty mental health services on more than one occasion. While accessing CAMH services the first time have been studied extensively, there is a paucity of research on accessing services a second time. To the best of my knowledge, no previous study has examined recurrent use of community-based CAMH services. The purpose of the current study was to address this gap in the literature; specifically, to examine rates and predictors of re-accessing community-based care. A better understanding of the factors that influence recurrent service use may help CAMH agencies better prepare for and facilitate this process for families. The following sections review relevant models of mental health service use, and the literature on predictors of accessing services and re-accessing services.

1.2 Models of Mental Health Service Use

Several theoretical models have been developed to conceptualize how children and families access and utilize mental health services. These models tend to be broad so as to be applicable to various areas of health research, including mental health. The Behavioral Model of Health Services Use, Network-Episode Model, and Revised Network-Episode Model are reviewed.

1.2.1 Behavioral Model of Health Services Use

The Behavioral Model of Health Service Use has been revised and expanded over the past 30 years (Andersen, 1986, 2014; Costello, Pescosolido, Angold, & Burns, 1998). The original model posited that the use of health services is influenced by three factors: (1) predisposing: pre-existing factors that influence the likelihood of needing services (e.g., age, sex, social structure); (2) enabling: situational factors that facilitate or impede help-seeking (e.g., socio-economic factors), and (3) need: factors related to clinical status and subjective evaluation of health or mental health that influence need for services (e.g., illness severity). These factors are theorized to both independently influence the use of health services and interact with one another (Andersen, 1986, 2014).

1.2.2 Network-Episode Model

The Network-Episode Model is a more recent framework which emphasizes the dynamic pathways of access and use of health services and shifts the focus away from the individual to social networks (Pescosolido, 1992). Specifically, it considers the networks in the community and in the treatment system. The latter includes the organization’s policies, culture and climate, and the professional-client relationship. These aspects create an environment of care, impact the work of providers, and influence clients’ reactions in treatment.

The Network-Episode Model is composed of 4 broad factors and 57 specific variables (nested within the broad factors): (1) social content includes social and geographic location (e.g., gender, income), personal health background (e.g., prior history of illness, coping style), illness characteristics (e.g., severity, duration), and organizational constraints (e.g., financing of care); (2) social support system comprises network structure (e.g., size, reciprocity), community network content (e.g., beliefs towards health), and community network functions (e.g., advice, emotional support, material support); (3) illness career involves key entrances (e.g., sick role), key exits (e.g., termination of care), and key timing and sequencing (e.g., delay and spacing of consultations); and (4) treatment system encompasses treatment network structure (e.g., size, duration), treatment network content (e.g., modality), and treatment network functions (e.g., information, material support). These four factors are posited to interact and influence the course of a child’s mental health treatment.

1.2.3 Revised Network-Episode Model

The Behavioral Model of Health Service Use and the Network-Episode Model, however, were based on health services for adults. These do not take into account the characteristics of the family, the influence of the school, or how the child’s disorder affects the family and teachers. Furthermore, the level of control that adults and children have over accessing services differs. Children rarely seek mental health treatment for themselves, rather an agent acts on behalf of the child. This agent is typically the primary caregivers, but the school, justice and/or welfare system may be involved as well (Costello et al., 1998).

The Revised Network-Episode Model addresses these limitations (Costello et al., 1998). The four factors and 57 variables from the Network-Episode Model were retained, and 19 variables were added: (1) social content considers child, parent, *and* family characteristics (e.g., child psychopathology, family psychiatric history); (2) social support system includes family network, parent-child relationship, and the school system (e.g., school system beliefs); and (3) illness career incorporates family and teacher burden, parent-school communication, and parental compliance (see Figure 1.1). The Revised Network-Episode Model was used to guide the selection of predictors in the current study. This model was chosen as it is a comprehensive framework that has been tailored for children’s use of services.

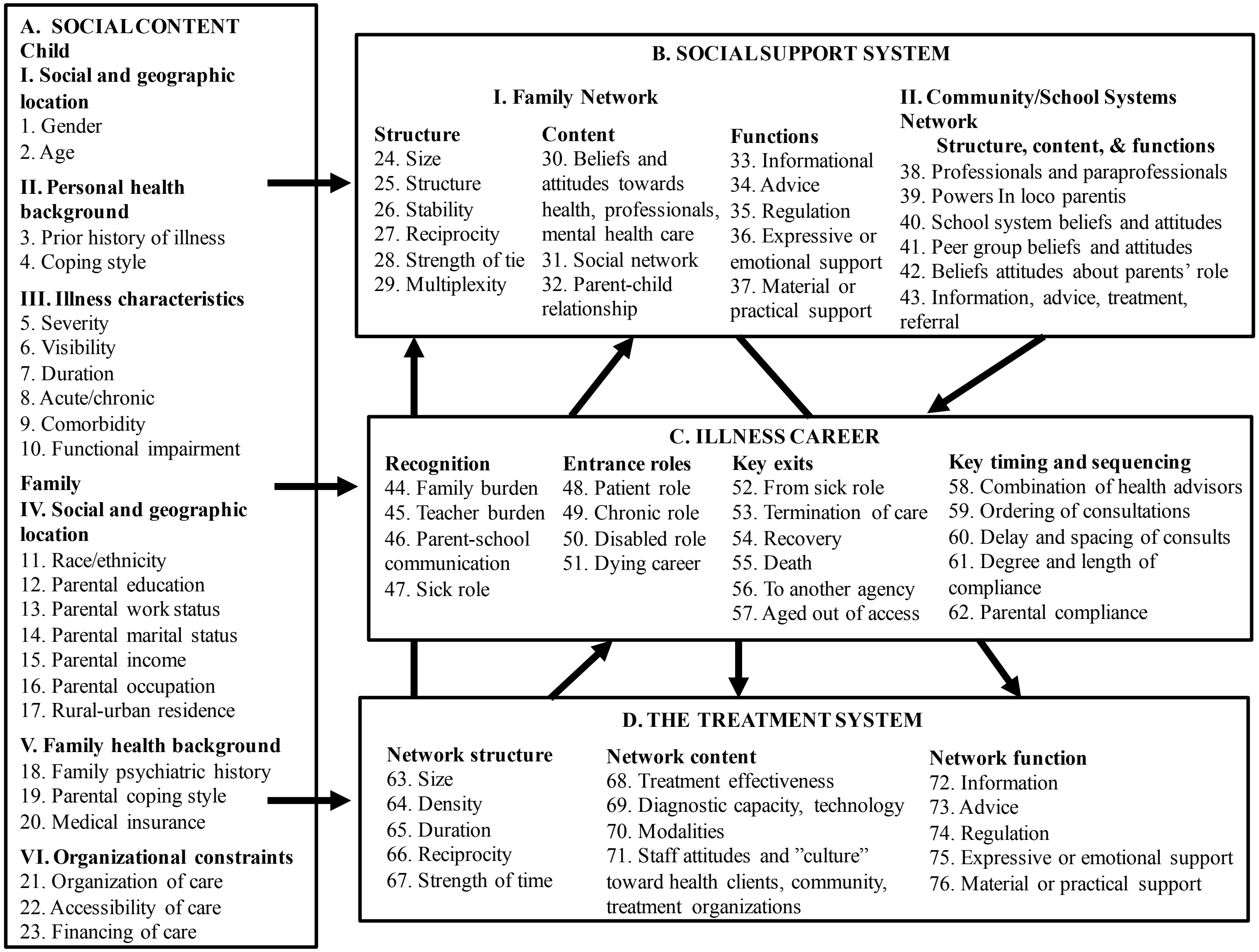

Figure 1.1. The Revised Network-Episode Model. Adapted from "A Family Network Based Model of Access to Child Mental Health Services". E. Costello, B. Pescosolido, A. Angold and B. Burns, 1998, *Research in Community and Mental Health, 9,* 172. Copyright 1998 by JAI Press Inc.

1.3 Accessing Services Literature

Extensive research has been conducted on accessing services. A number of variables have been identified as predictors of accessing services, compared to children in need of services who do not receive them, and are summarized in Table 1.1. There are some conflicting findings regarding the statistical significance and/or direction of some of the predictors. Such predictors have been placed in the *mixed findings* category and the nature of the conflicting finding is identified. For example, some studies have found that a poor parent-child relationship predicts service use, some have found that a good parent-child relationship predicts service use, and others have found no association (Ryan, Jorm, Toumbourou, & Lubman, 2015; review article).

The variables that predict access of services may also play a role in the recurrent use of services. Therefore, these findings guided the selection of predictors that were examined in the present study.

Table 1.1

Predictors of Accessing Children and Adolescent Mental Health Services Organized by Revised Network-Episode Categories

Significant findings	Mixed findings	Non-significant findings
Social content		
Males (childhood to early adolescence)	Age (younger, older) [b]	Birth order or weight
Females (later adolescence on)	Gender (males) [a]	Emotional abuse
Presence of physical health problems	Ethnicity (White) [a]	Parental education level
Physical abuse or neglect	Sexual abuse [a]	Parental employment status
Greater severity of problems	Child impairment [a]	Maternal age
Parental problem perception	Comorbid psychological disorders [a]	Family size
Parental need perception	Externalizing problems [a]	Housing tenure or quality
Change in family structure	Internalizing problems [a]	
Single-parent household	Parental psychopathology [a]	
	Family history of service use [a]	
	Socioeconomic status (higher, middle, lower) [b]	
	Insurance [a]	
Social support system		
Positive parental attitudes and beliefs towards mental health services	Parent-child relationship (poor, good) [b]	
Child welfare involvement		
Illness career		
More family stressors	Teacher's ratings [a]	
Greater parental burden	School-related problems [a]	
	Family functioning (poor, good) [b]	

Note: Based on Leslie et al., 2005 and Sourander et al., 2001 and the systematic literature reviews by Ryan et al., (2015); Sayal (2006); and Zwaanswijk, Verhaak, Bensing, van der Ende, and Verhulst (2003).

Mixed findings is a category used to indicate predictors for which there is conflicting findings regarding statistical significance and/or direction.

[a] Indicates a predictor for which there is conflicting statistical significance.

[b] Indicates a predictor for which there is conflicting statistical significance and direction.

1.4 Accessing Services a Second Time Literature

The natural history of mental health problems (i.e., recurrence and persistence) suggests that some families will have more than one episode of care. The literature on re-accessing outpatient services is reviewed separately from inpatient services.

1.4.1 Outpatient Services

Limited knowledge exists about which families seek further outpatient treatment and the factors that influence this decision. For this reason, the literature on adult and university student populations were also reviewed. As few studies were identified, results for each study are presented separately.

Kerkorian, McKay, and Bannon (2006) examined how families' previous experiences with CAMH services influenced their perceptions of barriers to service use in the future. The authors conducted secondary analyses on data from a larger study that examined the factors that influence engagement in mental health services. The sample for the principal study were families who had been referred for services (N = 253), and the sample for the secondary study were families who reported previous service use (n = 118, 47%). Only the data from the intake telephone interview were utilized in the secondary study. The authors found that parents' feelings of being disrespected by the provider predicted feelings of doubt about the utility of treatment. Similarly, studies among high school students (Rickwood, Deane, Wilson, & Ciarrochi, 2005) and adult populations (Deane, Skogstad, & Williams, 1999) have found that previous negative help-seeking experiences (e.g., problems were not taken seriously) negatively influenced future help-seeking intentions.

Dantas and colleagues (2011) examined clinical charts of undergraduate and graduate students who received university mental health services between 1987 and 2004. The authors found that 13.5% of students re-accessed services. Predictors of recurrent use of services included: younger age at first visit (i.e., less than 20 years), studying arts or humanities, living in residence, extended family members (e.g., grandparents) living with the family, having half-siblings, having a younger mother (i.e., less than 55 years of age), and complaints of poor memory and low self-esteem.

Siddall, Haffey, and Feinman (1988) examined repeated mental health service use in a Health Maintenance Organization setting in the United States that provided therapy for individuals, couples, family and children. During the 4-month study period, 27% of the requests for treatment were returning clients. Interestingly, 16% of returning clients indicated that they had *not* found previous therapy helpful. The disposition at discharge (i.e., conditions under which service was terminated) were as follows: 67% mutual (client and therapist) decision to terminate treatment, 1% referred elsewhere, 23% patient terminated treatment prematurely (based on clinician ratings), 6% long-term treatment recommended (but client discontinued treatment), and 26% discussed the possibility of returning (values sum > 100% as more than one option was indicated in some cases). However, the authors did not compare individuals who returned for services versus those who did not. This is a limitation that will be addressed in the current study.

In summary, from the few studies that have been conducted, a number of variables appear to predict recurrent service use (1) social content: age of mother (e.g. younger), poor memory, and lower self-esteem; (2) social support system: extended family members (e.g., grandparents) living with the family, and having a half-sibling; (3) treatment system: previous experience with mental health services (e.g., respected by provided).

1.4.2 Inpatient Services

There is a significant literature on re-admission to psychiatric hospitals and residential treatment centers. A number of variables have been identified as predictors of re-admission and time to re-admission; Table 1.2 provides a summary of these studies. Similar to the accessing care literature, there are some conflicting findings regarding the statistical significance and/or direction of some of the predictors. Such predictors have been placed in the *mixed findings* category and the nature of the conflicting finding is identified. For example, some studies have found that a shorter length of stay predicts re-admission (Lakin et al., 2008; Yampolskaya et al., 2013), some have found that a longer length of stay predicts re-admission (Fontanella, 2008; James et al., 2010), and others have found no association (Blader, 2004; Foster, 1999).

Table 1.2

Predictors of Re-Admission to Inpatient Services Organized by Revised Network-Episode Categories

Significant	Mixed findings	Non-significant
Social content		
Risk factors (e.g., abuse, violence, abandonment)	Ethnicity (White) [a]	Socio-economic status
History of criminal charges	Gender (females) [a]	History of violent behavior towards others
Neuropsychiatric disturbance	Age (older, younger) [b]	Child impairment at intake
Comorbid intellectual disability	History of suicidal behavior [a]	Comorbid psychological disorders
	Externalizing problems [a]	Parental hospitalization
	Internalizing problems [a]	Parental education level
	Child impairment at discharge [a]	
Social support system		
Presence of biological mother		Type of caregiver (i.e., biological, adoptive)
Dysfunctional relationship with their family members		Parental monitoring and control
Living in a group home or assisted care		Family cohesion
Permissive parenting style		
Corporal punishment		
Illness career		
Delay in receiving case management services	Parental involvement (lower) [a]	
Medication noncompliance		
Family burden		
Treatment system		
	Length of stay (shorter, longer) [b]	Payer source of care (e.g., public)
	Prior hospitalizations [a]	
	Receiving further services after discharge (e.g., outpatient, day treatment) [b]	

Note: Mixed findings is a category used to indicate predictors for which there is conflicting findings regarding statistical significance and/or direction. Based on findings from Arnold et al., 2003; Blader, 2004; Fite, Stoppelbein, & Greening, 2009; Fontanella, 2008; Foster, 1999; James et al., 2010; Lakin et al., 2008; Stewart, Kam, & Baiden, 2013; Yampolskaya et al., 2013.

[a] Indicates a predictor for which there is conflicting statistical significance.

[b] Indicates a predictor for which there is conflicting statistical significance and direction.

1.5 Current Study

There is a dearth of research on predictors of accessing services a second time. The research that has been conducted on the topic has focused on inpatient services. The generalizability of these findings to community-based CAMH services may be limited as children who receive services from inpatient units would be expected to have more severe psychopathology. Thus, re-admission may be more likely and the predictors of re-accessing inpatient services may differ from community-based services. The present study addresses this gap in the literature by examining predictors of re-accessing services using administrative data over a 4-year period from community-based CAMH services.

Variables that have been identified as predictors in the access and re-access to care literature were examined in the current study. Given the lack of research in the area, a number of additional variables were included as well. The rationale for including these variables is explained below.

First, child and caregiver strengths were included because of their relationship with the development of psychopathology, which may also play a role in the recurrence of problems and need for further services. Specifically, studies have shown that various child and caregiver strengths (e.g., social competence, optimism, adequate housing, supportive parenting) act as protective factors for the development of mental health problems (Hunsley & Lee, 2014). Within the context of the Revised Network-Episode Model, these would fit under illness characteristics. Second, disposition at discharge was included because of its relationship with need for services. Research has found that children who terminate treatment prematurely (i.e., drop-out) are more likely to experience persistent or worsening of symptoms and impairment, compared to those who complete treatment (de Haan, Boon, de Jong, Hoeve, & Vermeiren, 2013; Kazdin, Mazurick, & Siegel, 1994). There is evidence to support that greater child needs (e.g., psychopathology, impairment) are associated with access to services and re-admission to inpatient units (Farmer et al., 1999; Fontanella, 2008; Sayal, 2006). Within the context of the Revised Network-Episode Model, it would fit under termination of care. Third, the number and spacing of visits were included because they are proxies to predictors that have been examined in the re-admission literature. Namely, studies have found that length of stay predicts re-admission to inpatient units (e.g., Lakin et al., 2008). In the current study, families with the same duration of involvement differ in the number of pre-episode of care visits, number of first episode of care visits, and spacing of visits. Therefore, all three variables were included as proxies. Within the context of the Revised Network-Episode Model, these would fit under delay and spacing of consults, and duration of treatment. Lastly, level of care was included because it is directly related to treatment. Public policy and mental health literature have called for the provision of services that address children's needs in the least restrictive and least intensive settings (Bower & Gilbody, 2012; Burns, Thompson, & Goldman, 1993; Ministry of Children and Youth Services [MCYS], 2006). These services may not have been sufficient for some children, thereby resulting in a return for further treatment. Within the context of the Revised Network-Episode Model, it would fit under modalities of treatment.

1.6 Objectives & Hypotheses

Objective 1. Determine rates and patterns of re-accessing CAMH services.

Objective 2. Identify predictors of re-accessing CAMH services.

Objective 3. Identify predictors of the time to re-access CAMH services.

Hypotheses. Higher odds and higher risk of re-accessing services will be predicted by the following variables, organized by Revised Network-Episode categories:

(a) Social content: younger males, older females, history of abuse (physical or sexual) or neglect, single-parent household, lower socio-economic status (SES) profile of neighborhood, higher levels of psychopathology (i.e., internalizing problems, externalizing problems, greater impairment), lower child strengths, lower child relationship strengths, lower caregiver strengths, and higher care intensity and organization needs.

(b) Social support system: child welfare involvement.

(c) Illness career: greater family burden, greater spacing of visits (i.e., inconsistent care), and premature termination of services (i.e., drop-out).

(d) Treatment system: lower number of visits during the first episode of care, not having pre-episode of care visits, and lower levels of care (e.g., low, medium) during first episode of care.

Chapter 2: Methods

Secondary data analyses were conducted on data from a previous study that examined patterns of service utilization within CAMH agencies (Reid et al., 2010). The principal study is described first, followed by the current study.

2.1 Principal Study

Electronic administrative data were retrieved from 5 CAMH centers. The agencies were located in rural and urban areas in southwest, eastern, and central Ontario. The centers were accredited by Children's Mental Health Ontario, or a similar accreditation body, and provided services for children between 0 and 18 years of age. Data were extracted for visits between 2004 and 2010. The inclusion criteria were: (1) a first visit between 2004 and 2006, (2) children between 5 and 13 years of age at the time of their first visit, and (3) children with at least one in-person visit. The exclusion criteria were: (1) a developmental disorder diagnosis (e.g., autism spectrum), or (2) participation in a program for children with developmental disabilities.

2.1.1 Categorization of Visits

Each agency provided electronic visit data that included visit date, type of contact (e.g., telephone, in-person), type of service (e.g., group treatment), and duration of contact. The first in-person visit for each child was identified and data for 4 years after this date were extracted. To categorize visits into episodes of care, the data were re-organized so that the first in-person visit became day 1. An episode of care was defined as a minimum of 3 visits with a period of 180 days (6 months) without visits between episodes. Children could have visits that did not meet this criterion prior to the first episode of care; these are referred to as pre-episode of care visits. Children could also have visits that did not meet this criterion after the first episode of care; these are referred to as inter-episode of care visits (i.e., visits between the first and second episode of care) or post-episode of care visits (i.e., visits after the first episode of care, and there was no further involvement with the agency). See Figure 2.1 for a visual representation of how visit data were categorized.

The definition for an episode of care utilized in the current study was proposed by Reid and colleagues (2015). The authors considered different minimum number of visits (i.e., 2, 3, 5, 7, and 9) and free-periods (i.e., 90, 120, 150, and 180 days). These operational definitions were compared against clinician-defined start and end of an episodes of care, clinician-defined number of episodes, and time at which standardized intake measures were completed. A definition of 3 visits with a 180-day free-period yielded the greatest agreement with these measures.

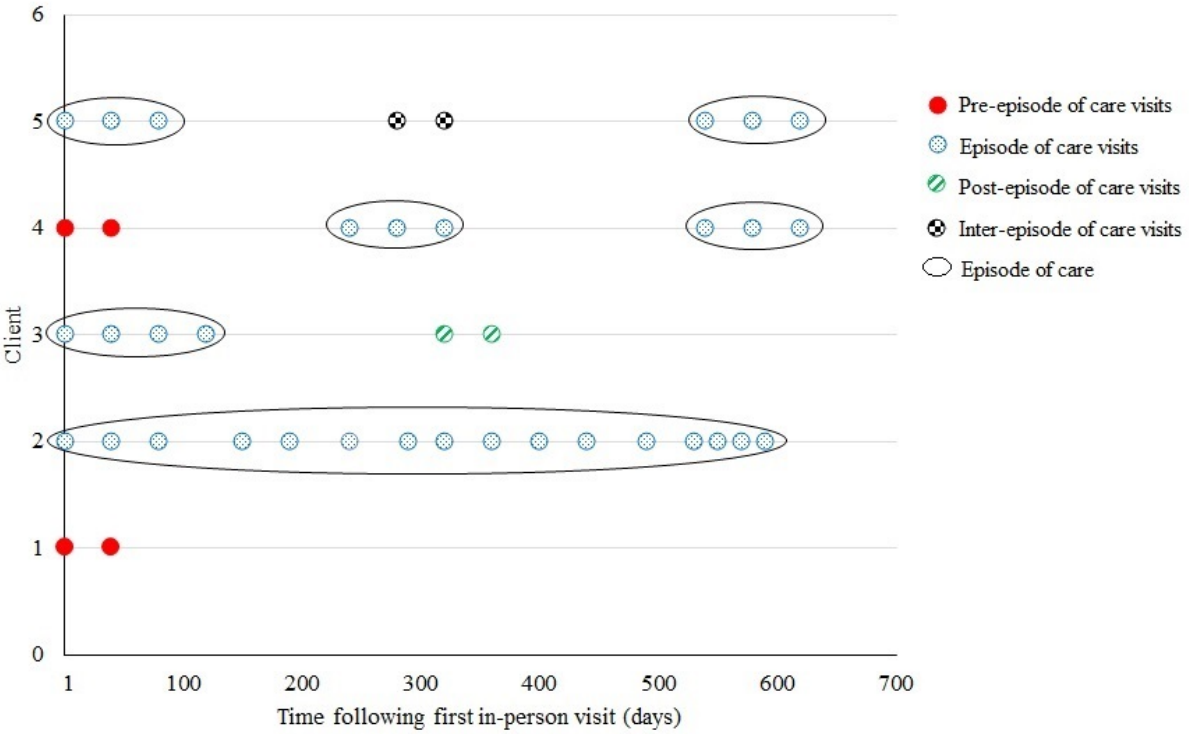

Figure 2.1. Hypothetical visit data over the course of 700 days categorized into episodes of care. *Client 1* is an example of a client that had just two visits. *Client 2* had a single episode of care consisting of 16 visits. *Client 3* had a single episode of care consisting of 4 visits and 2 post-episode of care visits, the first occurring 200 days after the end of the first episode of care. *Client 4* had 2 pre-episode of care visits, followed by a break of 200 days, a first episode of care consisting of 3 visits, a break of 220 days, and a second episode of care consisting of 3 visits. *Client 5* had one episode of care consisting of 3 visits, a break of 200 days, 2 inter-episode visits, a break of 220 days, and a second episode of care consisting of 3 visits.

2.1.3 Brief Child and Family Phone Interview (BCFPI)

The BCFPI is administered to caregivers as an intake measure in all publicly funded CAMH agencies in Ontario. BCFPI data were extracted from agencies' records as part of the larger study. Overall, 59% of the children who met the aforementioned inclusion criteria had a BCFPI completed.

2.1.4 Chart reviews

A key objective of the principal study was to examine patterns of service use. Multilevel latent class cluster analysis of the children's visit data (N = 5632) was used to identify mutually exclusive clusters or patterns of service use. The analysis revealed five distinct patterns: minimal (53% of children), brief-episodic (8%), acute (20%), intensive (13%), and ongoing/intensive-episodic (6%).

To understand these patterns of service use, a stratified random sample by age (5-9 years and 10-13 years) and sex was selected for chart reviews (n= 25 for each pattern; n = 125 per agency; n = 625). If a chart could not be reviewed (e.g., could not be located) or the information in the chart was insufficient to complete ratings of child functioning (see below for a description of the Child and Adolescent Needs and Strengths), another child's chart was used.

Chart reviews were conducted by trained research assistants at specific time points: start of involvement (i.e., first in-person visit), start and end of each episode of care, and end of involvement within the study time window (i.e., last in-person visit). The start of involvement was the same as the start of an episode of care if the next 2 visits were within 180 days (6 months) of each other (i.e., no pre-episode of care; see client 2 in Figure 2.1). The end of involvement was the same as the end of an episode of care if the previous 2 visits were within 180 days (6 months) of each other (i.e., no post-episode of care; see client 2 in Figure 2.1).

Information gathered and ratings completed included: (1) demographic information (e.g., date of birth, sex) , (2) Child and Adolescent Needs and Strengths scale (CANS; Lyons, 1999), and (3) disposition at discharge (e.g., referred, drop out, completed treatment). Every fifth chart (27%) was reviewed by two or three raters to assess inter-rater reliability: intraclass correlation coefficient (ICC) = 0.84 for CANS items, 95.6% agreement for non-CANS items and 92.1% agreement overall.

2.2 Current Study

2.2.1 Study Sample

The inclusion criteria for the present study were: (1) children who had at least one episode of care; (2) children who had at least 180 days (6 months) between the end of the first episode of care and the end of the study window; this criterion ensured that it was possible for children to re-access within the study window; (3) children for whom a forward sortation area (FSA) was available; FSA was used to determine neighborhood SES. The exclusion criteria were: (1) children who had inter-episode of care visits (i.e., 1-2 visits between the first and second episode of care). Inter-episode of care visits was one of the ways in which children re-access services, but could not be explored due to sample size concerns; (2) children who had *group/foster home* as the parental marital status. These children represent a population with unique needs, but could not be examined due to the small sample size (1%).

The methodology of the principal study (i.e., chart reviews) and missing data (i.e., BCFPI) mean that not all variables are available for all children. The three samples that emerge and their purpose are briefly described. See Figure 2.2 for a visual representation of participant selection and the different samples.

All electronic administrative data sample. Data from the eligible sample with electronic administrative data (N = 3399) were used to examine rates of re-accessing services, patterns of re-accessing services, and examine demographic (e.g., child age, child sex) and certain treatment (e.g., number of visits, spacing of visits) predictors.

All electronic administrative data with BCFPI sample. Data for all individuals who had a BCFPI up to 8 months prior to or 1 month after the start of the first episode of care (n = 1751) were used to examine demographic (e.g., child age, child sex), psychopathology (e.g., internalizing problems), impairment (e.g., child impairment, family burden), and certain treatment (e.g., number of visits, spacing of visits) predictors.

Chart review data sample. Chart review data (n = 426) were used to examine demographic (e.g., child age, child sex), psychopathology (e.g., internalizing problems), impairment (e.g., child impairment), strengths (e.g., caregiver needs and strengths, child strengths), and treatment (e.g., number of visits, spacing of visits, disposition at discharge) predictors.

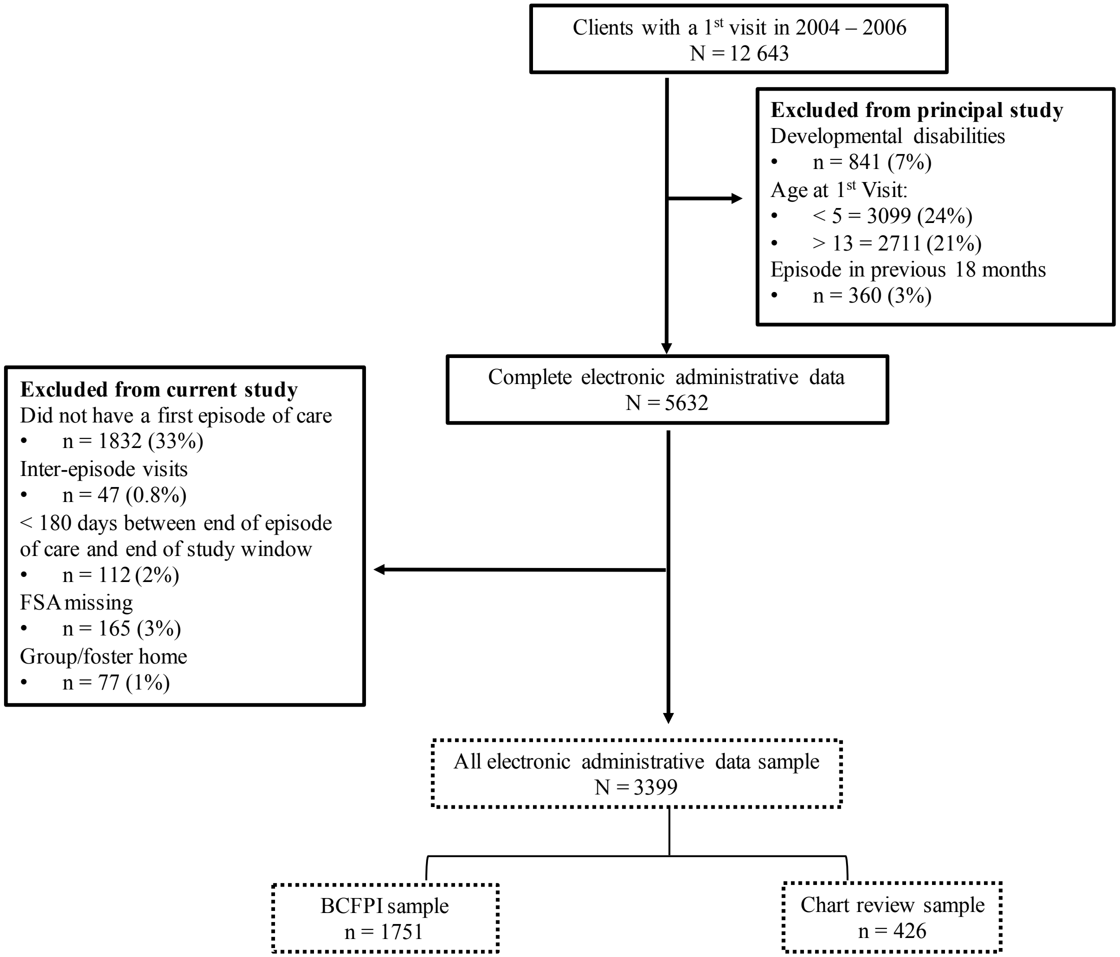

Figure 2.2. Flow chart showing participant selection and the samples that were used in the current study. The three samples are identified by boxes with dotted lines. Note that 61% of children in the chart review sample had BCFPI data available. FSA = forward sortation area.

2.2.2 Measures

Demographics. Demographic variables obtained from the electronic administrative data included: date of birth, sex, FSA (i.e., first three characters of the postal code that designate a geographical unit), and living arrangement (e.g., single-parent, two-parent, group/foster home).

Socio-economic status profile of neighborhood. The median income for each geographic area (FSA) in Ontario were extracted from the 2006 Canadian Census. These were sorted in order by income level and then split into 5 groups (i.e., quintiles). Quintile 1 indicates lowest income level (mean = $42, 646) and quintile 5 indicates highest income level (mean = $93, 627). The quintiles were then linked to the study sample using the FSA codes from the electronic administrative data. Categorizing the population by income quintiles is an approach that has been used in other studies and by health organizations across Canada (Canadian Institude for Health Information, 2015; Cohen et al., 2016).

Brief Child and Family Phone Interview (BCFPI). The BCFPI is a 30-minute questionnaire comprised of 81 forced-choice items that is administered to caregivers when they first contact an agency for help. Items are coded on a 3-point scale, where higher scores indicate more problems: 0 = never true; 1 = sometimes true; 2 = often true. The BCFPI has 9 mental health subscales (e.g., managing anxiety, regulating attention) and 5 composite scales (e.g., internalizing problems, externalizing problems, global child functioning, global family situation). Internal consistency (Cronbach's alpha) ranges from 0.73 to 0.88. Test-retest reliability ranges from 0.66 to 0.78 and factor analyses support the construct validity (Cunningham, Pettingill, & Boyle, 2006).

The present study used four composite scales: internalizing problems (i.e., separation from parents, managing anxiety and managing mood subscales), externalizing problems (i.e., regulation of attention and activity, cooperation, and conduct subscales), global child functioning (i.e., social participation, quality of relationships, school participation and achievement subscales), and global family situation (i.e., family comfort, family activities subscales). *T*-scores were calculated using age- and sex-based population norms. For descriptive purposes, a *T*-score above 70 (98th percentile) was used as the clinical cut-off point.

Child and Adolescent Needs and Strengths (CANS*).* The CANS (Lyons, 1999) is a comprehensive tool comprising 50 items used by mental health agencies to assist in decision-making and evaluate service outcomes. The CANS was developed using a clinimetric-communication perspective (Lyons, 1999), rather than a traditional psychometric approach (e.g., factor structure; Cronbach & Meehl, 1955). Items were selected for their relevance in service treatment planning and rated using a system that translated into level of action. The CANS has demonstrated good inter-rater reliability among researchers (intra-class correlation = 0.85) and between researchers and case workers (intra-class correlation = 0.81; Anderson, Lyons, Giles, Price, & Estle, 2003). In terms of construct validity, total CANS scores are correlated (r = 0.63) with other functional assessments like the Child and Adolescent Functional Assessment Scale (CAFAS; Dilley, Weiner, Lyons, & Martinovich, 2007).

In the current study, the CANS was completed by study personnel based on data in the clinical charts; it was not completed by participating CAMH agency staff. This approach has been found to be reliable (Anderson et al., 2003), and used in other studies (Carson, Stewart, Lin, & Alegria, 2011).

The CANS has five need domains: (1) problem presentation (13 items; e.g., attention deficit/impulse control, antisocial behavior), (2) risk behaviors (6 items; e.g., crime and delinquency), (3) child functioning (8 items; e.g., school achievement), (4) care intensity and organization (4 items; e.g., service permanence), (5) caregiver needs and strengths (9 items; e.g., supervision, residential stability). These items are coded on a 4-point scale, where higher scores indicate a higher need: 0 = no evidence and/or no need for action; 1 = mild degree and/or need for watchful waiting to see if action is needed; 2 = moderate degree and/or need for action; 3 = severe or profound degree and/or need for immediate or intensive action. It also has one strength domain: (1) child strengths (10 items; e.g., interpersonal, education); these items are coded on a 4-point scale, where lower scores indicate greater strength: 0 = significant strengths; 1 = moderate strengths; 2 = mild strengths; 3 = no known strength in this area.

The CANS was completed by study personnel at the start of involvement, start of an episode of care, end of an episode of care, and end of involvement. For the start of involvement/episode of care, raters used intake summaries, BCFPI (if available) and case notes for the first 3 months following the first in-person visit, or up to 10 case notes (whichever came first). For the end of involvement/episode of care raters used, the CAFAS (if available) and case notes from the 3 months prior to the last in-person visit, or the last 10 case notes (whichever came first). If there was an overlap between the first 3 months following the first in-person visit and the 3 months prior to the last in-person visit, only an intake CANS was completed; this occurred for 36% of the cases in the current study sample. It was assumed that CANS scores at intake and discharge would have remained relatively stable for those with an overlap. Consequently, CANS discharge scores were imputed using CANS intake scores. All raters completed standardized on-line training and training by an experienced coder. Every fifth chart (27%) was reviewed by two or three raters to assess inter-rater reliability. ICC = 0.84 for CANS items.

Internalizing and externalizing subscales were developed using CANS variables to have psychopathology variables that were similar for the BCFPI and the chart review samples. This is possible as the CANS allows for flexible methods of scoring. The psychometric properties of the other CANS domains (i.e., child functioning, caregiver needs and strengths, care intensity and organization, and child strengths) were also examined. Seven subscales were developed: (1) internalizing problems, (2) externalizing problems, (3) child impairment, (4) care intensity and organization, (5) caregiver needs and strengths, (6) child strengths, and (7), child relationship strengths. Appendix A provides detailed information of the subscale development and psychometric properties in the current study sample.

In the present sample, Cronbach's alpha ranged from 0.36 (child relationship strengths) to 0.84 (externalizing problems). The divergent and convergent validity was also examined using the BCFPI. The internalizing problems, externalizing problems, and child impairment CANS subscales were all significantly correlated with their BCFPI counterparts (internalizing problems $r = 0.57$, externalizing problems $r = 0.58$, and child impairment $r = 0.51$). Moreover, the correlation with the counterparts was stronger than with the other BCFPI scales. The caregiver needs and strengths, child strengths, and child relationship strengths CANS subscales do not have a counterpart in the BCFPI. However, these subscales were correlated with some of the problem presentation and functioning BCFPI scales as would be expected. For example, child relationship strengths was significantly correlated with global child functioning ($r = 0.38$, $p < .01$).

Some of the psychometric properties of the CANS in the current study were not as strong as would be expected from a traditional scale (e.g., Children's Depression Inventory 2; Kovacs & MHS Staff, 2011). This is not unexpected (Fava, Tomba, & Sonino, 2012). The clinimetric approach used by the CANS aims to measure various areas of needs and strengths to create a comprehensive picture of the child and his/her family and environment to inform CAMH service planning. For example, the internalizing problems subscale includes items like depression and adjustment to trauma. While these items are conceptually related, it is unlikely that many children have both depressive symptoms and traumatic experiences.

2.3 Outcome Variables

The primary outcome variable was whether individuals re-accessed services. This was operationally defined as obtaining services a second time after a free period of, at least, 180 days (6 months) without a visit. There are two ways in which children could obtain further services: post-episode of care visit (i.e., 2 visits after the first episode of care; see client 3 in Figure 2.1) or second episode of care (i.e., 3 or more visits after the first episode of care; see client 4 in Figure 2.1). This was coded as follows: 0 = did not re-access services; 1 = re-accessed and had a post-episode of care visits; 2 = re-accessed and had a second episode of care.

The secondary outcome was time to re-access mental health services. This was operationally defined as time in months between the last visit in the first episode of care and the first visit in the post-episode of care or a second episode of care. Post-episode of care and second episode of care were examined independently.

2.4 Predictor Variables and Coding

Demographic, psychopathology, impairment, and treatment predictors of re-accessing and time to re-access services were examined. The variables were coded and re-categorized to run the analyses and facilitate interpretation. Table 2.1 summarizes the predictors in each of the samples (see Appendix B for an organization of predictors by specific Revised Network-Episode Model variables). The following sections outline how this was done.

Table 2.1

Predictors of Re-Accessing Services and Time to Re-Access Services Organized by Revised Network-Episode Categories in the Current Study

All electronic data sample	BCFPI sample	Chart review sample
Social content		
Child sex	Child sex	Child sex
Child age	Child age	Child age
Child age and sex interaction	Child age and sex interaction	Child age and sex interaction
SES profile of neighborhood	SES profile of neighborhood	SES profile of neighborhood
Parental marital status (i.e., two-parent, single parent, unknown)	Parental marital status (i.e., two-parent, single parent, unknown)	Parental marital status (i.e., two-parent, single parent, unknown)
-n/a-	Internalizing problems [a] - Intake	Internalizing problems [b] - Intake - Discharge
-n/a-	Externalizing problems [a] - Intake	Externalizing problems [b] - Intake - Discharge
-n/a-	Child impairment [a] - Intake [a]	Child impairment [b] - Intake - Discharge
-n/a-	-n/a-	Child strengths [b] - Intake - Discharge
-n/a-	-n/a-	Child relationship strengths [b] - Intake - Discharge
-n/a-	-n/a-	Caregiver strengths [b] - Intake - Discharge
-n/a-	-n/a-	Care intensity and organization [b] - Intake - Discharge
		History of abuse or neglect
Social support system		
-n/a-	-n/a-	Child welfare involvement
Illness career		
Spacing of visits	Spacing of visits	Spacing of visits
-n/a-	Family burden [a] - Intake	-n/a-
-n/a-	-n/a-	Disposition at discharge

Treatment system		
One or more pre-episode of care visits	One or more pre-episode of care visits	One or more pre-episode of care visits
Number of visits in first episode of care	Number of visits in first episode of care	Number of visits in first episode of care
Level of care	Level of care	Levels of care

Note: SES = socio-economic status; -n/a- = variable not available in the sample.

[a] Variables from the BCFPI.

[b] Variables from the CANS.

Age. The age (years) at the beginning of the first episode of care was calculated for each child. Age was a continuous predictor.

Sex. The principal study coded sex into 2 categories: 0 = female; 1 = male. Sex was a categorical predictor with male sex as the reference group.

SES profile of neighborhood. Children were assigned an income quintile based on the FSA code from the electronic data (see page 23). SES profile of neighborhood was a categorical predictor with quintile 1 as the reference group.

Parental marital status. The principal study coded parental marital status into 4 broad categories (i.e., single-parent household, two-parent household, unknown, and group/foster home). Children in group/foster homes were excluded as they represented a very small group in the current study (~1%) and were believed to have unique needs. Given the substantial number of children with unknown parental marital status (22%), the variable was coded as follows: 0 = unknown; 1 = single-parent household; 2 = two-parent household. Parental marital status was a categorical predictor with two-parent household as the reference group.

BCFPI. The internalizing problems, externalizing problems, child global functioning (i.e., child impairment), and global family situation (i.e., family burden) composite scores were utilized. *T*-scores for these composite scales were categorized into four groups to facilitate interpretation of results: less than 60 (i.e., within average range), 60-69 (i.e., borderline), 70-79 (i.e., clinically significant, low range), and over 80 (i.e., clinically significant, high range). BCFPI composite scores were categorical predictors with *T*-scores less than 60 as the reference group.

CANS. The composite score for each of the subscales at intake and discharge was calculated by taking the mean of the items. The lowest possible composite score was 0 and the highest composite score was 3; the average composite score for all subscales (except for child relationship strengths at intake) fell below 1. It is somewhat difficult to interpret descriptive statistics, odds ratios, and hazards ratios as decimals. Consequently, the composite scores were multiplied by 10 and rounded to the nearest integer. CANS composite scores were continuous predictors.

History of abuse or neglect. The principal study coded the number of abuse and neglect factors (i.e., sexual abuse, physical abuse, neglect, witness to violence, witness to domestic violence, and victim of violence) at intake (i.e., first visit at the start of the first episode of care) and discharge (i.e., last visit at the end of the first episode of care or last visit at the agency within the study frame). There were few changes in history of abuse or neglect from intake to discharge; therefore, only data from intake were used. Since few children had a history of abuse or neglect, the variable was dichotomized: 0 = history of abuse or neglect (i.e., ≥ 1 of the 6 abuse or neglect factors); 1 = no history of abuse or neglect (i.e. 0 of the 6 abuse or neglect factors). History of abuse or neglect was a categorical predictor with no history of abuse or neglect as the reference group.

Child welfare involvement. The principal study coded child welfare involvement at intake (i.e., first visit at the start of the first episode of care) and discharge (i.e., last visit at the end of the first episode of care or last visit at the agency within the study frame) into 4 broad categories (e.g., investigation, some involvement). There were few changes in child welfare involvement from intake to discharge, therefore, only involvement at intake was examined. Since the categories of child welfare involvement had small cell sizes, the variable was dichotomized: 0 = any child welfare involvement; 1 = no child welfare involvement. Child welfare involvement was a categorical predictor with no child welfare involvement as the reference group.

Spacing of visits. The following steps were taken to derive the spacing of visits during the first episode of care. First, the time in days between each visit was computed for each child. Second, the standard deviation (SD) of the time between visits was calculated for each child. Third, the SD of the time between visits was rounded to the nearest integer to facilitate interpretation. Spacing of visits was index of the SD of the time between visits; higher values indicate greater variability. Spacing of visits was a continuous predictor.

Disposition at discharge. The principal study coded disposition at discharge (i.e., last visit at the end of the first episode of care or last visit at the agency within the study frame) into 10 broad categories (e.g., dropped-out, completed treatment). Since the hypothesis for the current study focused on children who dropped-out and the other categories had small cell sizes, the variable was dichotomized: 0= dropped-out (e.g., “dropped-out”, “treatment received, refused additional treatment”, “refused treatment”); 1 = all others (e.g., “completed treatment”, “assessment only”). Disposition at discharge was a categorical predictor with “all other dispositions” as the reference group.

One or more pre-episode of care visits. Pre-episode of care visits ranged from 1 to 3 in the current sample. Given the low range, the variable was dichotomized: 0 = one more pre-episode of care visits; 1= no pre-episode of care visits. One or more pre-episode of care visits was a categorical predictor with no pre-episode of care visits as the reference group.

Number of visits in the first episode of care. The number of visits in the first episode of care was extracted for each child. Number of visits was a continuous predictor.

Level of care. A level of care classification was developed to capture the predominant type of service each child/family received. First, staff at each CAMH agency reviewed their agencies’ services and categorized each type of service within the MCYS framework (MCYS, 2006). Second, the MCYS categories were grouped into 4 levels of care: 1 = low (e.g., drop-in resource center, outreach services); 2 = medium (e.g., individual counselling, family counselling); 3 = high (e.g., crisis intervention, day treatment); 4 = very high (e.g., wraparound, treatment foster care). The levels were derived for the current study based on the restrictiveness of the treatment, the expected duration of treatment, and the expected number of professionals involved. Higher levels represent more restrictive settings with longer expected duration of treatment and more professionals involved. Third, the percentage of visits in each level was calculated for each child. The level with the highest percentage of visits represented the level of care received. If two or more levels had equal percentages, the highest level was chosen. See Appendix C for more information. Levels of care was a categorical predictor with low level of care as the reference group.

2.5 Data Analyses

Analyses were conducted in SPSS (Version 24) and EQS (Version 6) for Windows. A summary of the analyses conducted is provided in Table 2.2. As described above, not all variables are available for all participants. Whenever possible, analyses were replicated in the different samples. The following sections provide additional information about weighting, multinomial logistic regression, and survival analysis.

Table 2.2

Summary of Data Analyses Organized by Study Objective

Study objective	Analyses	Sample
Determine rates and patterns of re-accessing CAMH services	- Point prevalence and confidence interval - Range, mean, median	- All electronic data
Identify predictors of re-accessing services	- Multinomial logistic regression	- All electronic data - BCFPI - Chart review
Identify predictors of the time to re-access mental health services	- Continuous survival analysis (Cox regression)	- All electronic data - BCFPI - Chart review

2.5.1 Weighting

A key objective of the principal study was to examine patterns of service use. To this end, an equal number of charts for each pattern of service use (using stratified random sampling) was selected for chart reviews. The percentage of children in each pattern varied. For example, 53% of children were in the minimal care pattern, while 8% were in the brief-episodic care pattern. All analyses in the chart review sample were weighted (Hahs-Vaughn, 2005) to account for the sampling strategy and to be able to draw conclusions for the population of children receiving CAMH services. Normalized weights were used in the multinomial logistic regression, as it preserves the sample size (Hahs-Vaughn, 2005). Rounded normalized weights were used in the survival analyses as this method requires integer case weights.

2.5.2 Multinomial Logistic Regression

Multinomial logistic regression was used to generate models that predict re-accessing services. Unadjusted and adjusted odds ratios (OR) were calculated to determine the effect that each variable had on the outcome independently, and adjusting for other predictors. In the chart review sample, only the variables that had significant unadjusted ORs were included in the multivariate models due to the small sample size. ORs can be interpreted as the change in odds of re-accessing services for every one-unit increase (e.g., one year increase in age) or compared to another category (e.g., females compared to males). Values higher than 1 indicate higher odds, values lower than 1 indicate lower odds, and a value of 1 indicates equal odds (Stoltzfus, 2011; Warner, 2013).

Predictor variables were entered using forced entry in blocks based on the Revised Network-Episode Model categories outlined in Table 2.1. The overall model was interpreted first, follow by the individual predictors. Multinomial logistic regression was used as the primary outcome has 3 levels and it requires less restrictive assumptions compared to other approaches like discriminant analyses (e.g., homogeneity of variance/covariance; Warner, 2013).

Assumptions. Multinomial logistic regression has a number of assumptions that were checked prior to running the analyses (Ottenbacher, Ottenbacher, Tooth, & Ostir, 2004; Stoltzfus, 2011). First, there should be sufficient events per independent variable (i.e., 5 or higher). Cross-tabulations were examined to ensure appropriate number of events. Second, there should be a linear relationship between continuous predictors and their logit-transformed outcomes (i.e., linearity of the logit). The Box-Tidwell test was conducted to examine this assumption; the test involves computing the natural logarithm of each continuous predictor and modeling interactions between each predictor and its natural logarithm. A statistically significant relationship reflects a violation of the linearity of the logit assumption. Third, there should be an absence of multicollinearity among independent variables. Correlations between predictors were calculated to evaluate their relationship. Fourth, there should not be strongly influential outliers. Outliers on continuous predictor variables (greater than 3.29 standard deviations above the mean; Tabachnick & Fidell, 2001) were truncated at the highest value not flagged as an outlier.

2.5.3 Survival Analyses

Continuous survival analyses, specifically Cox regression, was used to examine predictors of the time to re-access mental health services. Unadjusted and adjusted hazards ratios (HRs) were calculated to determine the effect that each variable had on the outcome independently, and adjusting for other predictors. In the chart review sample, only the variables that had significant unadjusted HRs were included in the multivariate models due to the small sample size. HRs can be interpreted as the change in risk of re-accessing services for every one-unit increase (e.g., one year increase in age) or compared to another category (e.g., females compared to males). Values higher than 1 indicate higher risk and shorter time to re-access, values lower than 1 indicate lower risk and longer time to re-access, and a value of 1 indicates equal risk and time to re-access (Allison, 2010; Kleinbaum & Klein, 2011).

Predictor variables were entered in blocks based on the Revised Network-Episode Model categories outlined in Table 2.1. The overall model was interpreted first, follow by the individual predictors. Cox regression was used as it is the most common survival analysis procedure, and it takes censoring into account (i.e., some participants do not experience the event of interest; Flynn, 2012).

Assumptions. The key assumptions for cox regression are proportional hazards and non-informative censoring (Flynn, 2012). Proportional hazards specify that the HR for each predictor is constant over time. Time-dependent covariates (i.e., interaction of each predictor with time) were included in the model to evaluate the proportional hazard assumption. A statistically significant relationship reflects a violation of proportional hazards assumption. The interaction between time and certain variables was found to be significant in some samples: SES profile of neighborhood in predicting time to a second episode of care (all electronic data sample); levels of care in predicting time to a second episode of care (all electronic data sample); and child strengths at intake in predicting post-episode of care visits (chart review sample). It has been argued that HRs of variables that do not meet this assumption can still be interpreted and can be considered as the average effect over time (Allison, 2010). Furthermore, there were minimal changes in the HRs for the other predictor variables when the violating variables were stratified in the analyses (see Appendix D).

Non-informative censoring stipulates that there should not be a correlation between time-to-event and time of censoring. In the current study, this may be a possibility if families re-accessed services for which we do not have data for (e.g., another agency). This is acknowledged as a potential source of bias in estimates (Flynn, 2012; Kleinbaum & Klein, 2011).

Chapter 3: Results

3.1. Descriptive Statistics

A summary of the descriptive statistics for the demographic, service use, and psychopathology variables are provided in Tables 3.1 to 3.4. Statistics for each sample are presented separately. Repeated measures multivariate analysis of variance (MANOVA) was conducted to examine differences in the CANS subscales at intake and discharge. Results showed statistically significant effect of time [Wilks' Lambda $F(7, 387) = 32.75$, $p < .001$]. See Table 3.4 for means and univariate F values.

T-tests and chi-square tests were conducted to compare children for whom BCFPI data were available versus not available (see Table 3.5). There were differences in a number of variables: age, SES profile of neighborhood, parental marital status, one or more pre-episode of care visits, number of visits in the first episode of care, and level of care during the first episode of care.

T-tests and chi-square tests were also conducted to compare children for whom chart review data were available versus not available (see Table 3.6). There were differences in a number of variables: SES profile of neighborhood, parental marital status, number of visits in the first episode of care, and level of care during the first episode of care.

Table 3.1

Descriptive Statistics for Demographic Predictor Variables in Each Sample

	All electronic data sample (n = 3399)	BCFPI sample (n = 1751)	Chart review sample (n = 426)
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)
Age (years)	9.93 (2.58)	10.08 (2.26)	10.02 (2.47)
Child sex (male)	2123 (62.5%)	1121 (64.0%)	262 (61.5%)
SES profile of neighborhood			
Quintile 1	749 (22.0%)	428 (24.5%)	98 (23.0%)
Quintile 2	659 (19.4%)	365 (20.8%)	98 (23.0%)
Quintile 3	812 (23.1%)	411 (23.5%)	108 (25.4%)
Quintile 4	784 (23.9%)	361 (20.6%)	96 (22.5%)
Quintile 5	395 (11.6%)	186 (10.6%)	26 (6.1%)
Parental marital status			
Single-parent	1346 (39.6%)	662 (37.8%)	136 (31.9%)
Two-parent	1298 (38.2%)	630 (36.0%)	155 (36.2%)
Unknown	755 (22.2%)	459 (26.2%)	136 (31.9%)
History of abuse or neglect	-n/a-	-n/a-	221 (52.0%)
Child welfare involvement	-n/a-	-n/a-	170 (40.0%)

Note: SES = socio-economic status; unknown indicates families for whom parental marital status was not documented; -n/a- = variable not available in the sample.

Table 3.2

Descriptive Statistics for Mental Health Service Use Predictor Variables in Each Sample

	All electronic data sample (n = 3399)	BCFPI sample (n = 1751)	Chart review sample (n = 426)
	n (%) or M (SD)	n (%) or M (SD)	n (%) or M (SD)
One or more pre-episode of care visits	271 (8.0%)	103 (5.9%)	27 (6.3%)
Spacing of visits during first episode of care (SD units)	19.07 (15.58)	20.15 (15.57)	19.12 (15.15)
Number of visits in first episode of care	16.06 (18.93)	16.73 (19.13)	16.97 (20.84)
Level of care during first episode of care			
Low	1414 (41.6%)	755 (43.1%)	156 (36.7%)
Medium	1079 (31.7%)	541 (30.9%)	149 (35.0%)
High	317 (9.3%)	135 (7.7%)	61 (14.3%)
Very high	589 (17.3%)	320 (18.3%)	60 (14.0%)
Disposition at discharge			
Dropped out	-n/a-	-n/a-	77 (18.1%)
Other	-n/a-	-n/a-	349 (81.9%)

Note: Other disposition at discharge indicates all other dispositions at discharge (e.g., completed treatment, treatment ongoing); -n/a- = variable not available in the sample.

Table 3.3

Descriptive Statistics for Psychopathology Predictor Variables in BCFPI Sample

Composite BCFPI scale	*T*-scores	Clinically significant problems
	M (SD)	n (%)
Internalizing problems	63.98 (14.29)	582 (33.2%)
Externalizing problems	69.63 (13.03)	936 (53.5%)
Child impairment	67.66 (14.35)	792 (45.2%)
Family burden	76.97 (20.75)	1038 (59.3%)

Note: Clinically significant refers to *T*-scores above 70 (98th percentile compared to population norms).

Table 3.4

Descriptive Statistics for Psychopathology Predictor Variables in Chart Review Sample at Intake and Discharge from the First Episode of Care

CANS subscales	Intake M (SD)	Discharge M (SD)	*F*	*p*
Internalizing problems	6.86 (4.88)	4.23 (3.97)	136.25	< .001
Externalizing problems	9.29 (5.20)	6.43 (5.34)	158.33	< .001
Child impairment	6.15 (4.05)	4.31 (4.01)	120.25	< .001
Caregiver needs and strengths	5.87 (3.24)	5.58 (3.30)	3.11	.079
Care intensity and organization	6.97 (2.97)	6.30 (4.08)	74.32	.001
Child strengths	8.68 (4.61)	6.09 (4.52)	115.95	< .001
Child relationship strengths	10.32 (4.68)	8.91 (4.62)	41.53	< .001

Note: CANS = Child and Adolescent Needs and Strengths.

Table 3.5

Analyses Comparing Children for Whom BCFPI Data Were Available Versus Not Available

	All electronic data	
	With no BCFPI data available (n = 1648)	With BCFPI data available (n = 1751)
	n (%) or M (SD)	n (%) or M (SD)
Age (years)	9.78 (2.88)	10.08 (2.23)**
Child sex (male)	1002 (60.8%)	1121 (64.0%)
SES profile of neighborhood		
Quintile 1	321 (19.5%)	428 (24.5%)*
Quintile 2	294 (17.8%)	365 (20.8%)*
Quintile 3	401 (24.3%)	411 (23.5%)
Quintile 4	423 (25.7%)	361 (20.6%)*
Quintile 5	209 (12.7%)	186 (10.6%)
Parental marital status		
Single-parent	684 (41.5%)	662 (47.8%)*
Two-parent	668 (40.5%)	630 (36.0%)*
Unknown	296 (18.0%)	459 (26.2%)*
One or more pre-episode of care visits	168 (10.2%)	103 (5.9%)*
Spacing of visits during first episode of care (SD units)	17.92 (15.51)	20.15 (15.57)
Number of visits in first episode of care	15.34 (18.70)	16.73 (19.13)*
Level of care during first episode of care		
Low	659 (40.0%)	755 (43.1%)
Medium	538 (32.6%)	541 (30.9%)
High	182 (11.1%)	135 (7.7%)*
Very high	269 (16.3%)	320 (18.3%)

Note: SES = socio-economic status. *z* tests for column proportions for each row in a chi-square contingency table were computed if the chi square statistic was significant (Sharpe, 2015).
* p< . 05

Table 3.6

Analyses Comparing Children for Whom Chart Review Data Were Available Versus Not Available

	All electronic data	
	With no chart review data available (n = 2921)	With chart review data available (n = 426)
	n (%) or M (SD)	n (%) or M (SD)
Age (years)	9.95 (2.59)	10.02 (2.47)
Child sex (male)	1823 (62.4%)	262 (61.5%)
SES profile of neighborhood		
Quintile 1	644 (22.0%)	98 (23.0%)
Quintile 2	541 (18.5%)	98 (23.0%)*
Quintile 3	699 (23.9%)	108 (25.4%)
Quintile 4	680 (23.3%)	96 (22.5%)
Quintile 5	357 (12.2%)	26 (6.1%)*
Parental marital status		
Single-parent	621 (21.3%)	136 (31.9%)*
Two-parent	1164 (39.8%)	155 (36.2%)
Unknown	1135 (38.9%)	136 (31.9%)*
One or more pre-episode of care visits	214 (7.3%)	27 (6.3%)
Spacing of visits during first episode of care (SD units)	18.95 (15.78)	19.12 (15.15)
Number of visits in first episode of care	14.81 (17.38)	16.97 (20.84)*
Level of care during first episode of care		
Low	1252 (42.9%)	156 (36.7%)*
Medium	892 (30.5%)	149 (35.0%)
High	268 (9.2%)	61 (14.3%)*
Very high	509 (17.4%)	60 (14.0%)

Note: SES = socio-economic status. *z* tests for column proportions for each row in a chi-square contingency table were computed if the chi square statistic was significant (Sharpe, 2015).
* $p < .05$

3.2. Rates and Patterns of Re-Accessing CAMH Services

The first objective was to determine the rates and patterns of re-accessing CAMH services (i.e., at least one visit 6-months or longer after the first episode). Of the 3399 children who had a first episode of care, 30.0% (95% CI = 28.4% - 31.6%) re-accessed services. Time to re-access ranged from 6 (minimum time as per definition of an episode of care) to 48 months (M = 17.09, median = 13.00 months, SD = 10.40).

There were two ways in which children could re-access services: post-episode of care visits (i.e., 2 visits after the first episode of care) or a second episode of care (i.e., 3 or more visits after the first episode of care). The rate for post-episode of care visits was 10.4% (95% CI = 9.4% - 11.5%). Time to post-episode of care visits ranged from 6 to 48 months (M = 18.94, median = 16.00, SD = 11.30). The rate for a second episode of care was 19.6% (95% CI = 18.3% - 21.0%). Time to second episode of care (i.e., 3 or more visits) ranged from 6 months to 44 months (M = 16.11, median = 12.00, SD = 9.77).

The frequency distribution of time to re-access (see Figure 3.1) shows that the number of people who return is highest 6-8 months after the end of the first episode of care, and decreases over time. Moreover, the trends for post-episode of care visits and second-episode of care are similar. One difference is that more children who have a second episode of care appear to re-access care sooner.

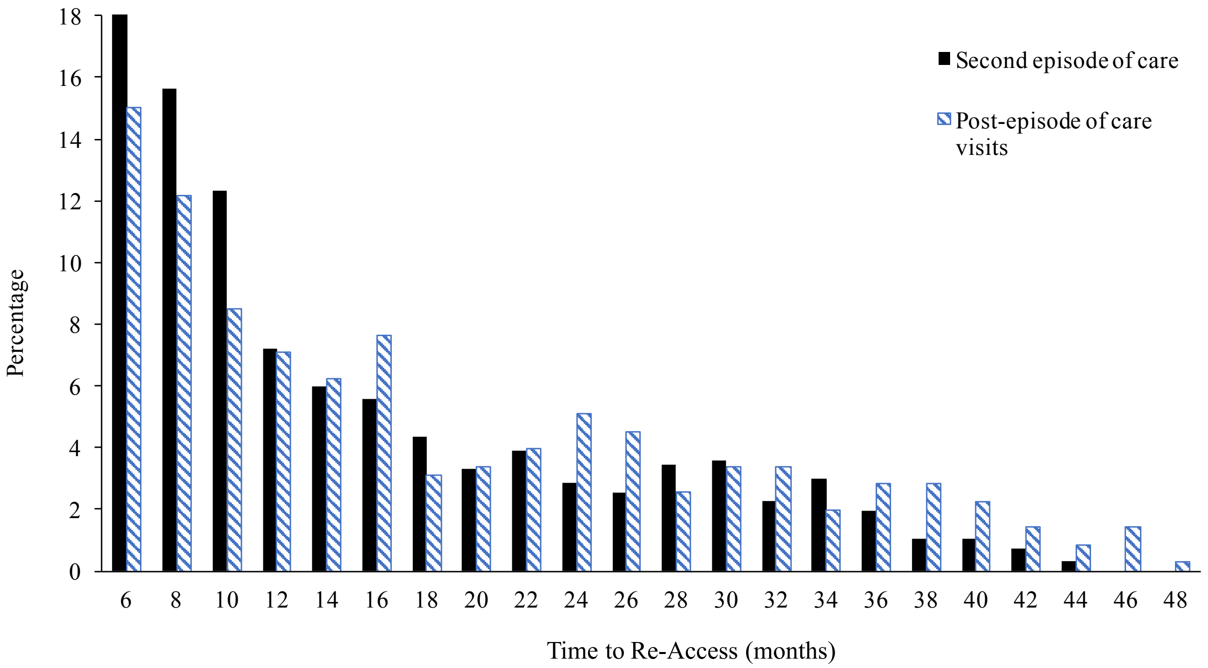

Figure 3.1. Distribution of time to post-episode of care visits and second episode of care in months.

3.3. Predictors of Re-Accessing Services

The second objective was to identify predictors of re-accessing services. Multinomial logistic regressions were utilized to generate models that predict re-accessing services. The group of children who did not re-access services was used as the reference category.

All electronic data sample. Table 3.7 presents the ORs and 95% confidence interval for each predictor, including the unadjusted and adjusted estimates. The full multinomial logistic regression model predicting re-accessing services provided an adequate fit based on the likelihood-ratio test ($p < .01$) and Pearson goodness-of-fit test ($p > .05$). The addition of treatment system, but not illness career, variables improved the fit of the model. Appendix E summarizes the fit statistics for each step.

No predictors were statistically significant in predicting post-episode of care visits. However, in the multivariate model, children who received a medium level of care had a 32% increase in odds compared to children who received a low level of care; for every 1-visit increase, there was a 1% decrease in odds.

Five predictors were statistically significant in predicting a second episode of care: child age, SES profile of neighborhood, parental marital status, one or more a pre-episode of care visits, and level of care. In the multivariate model, families with unknown parental marital status had a 2-fold increase in odds compared to two-parent households; children who received a medium level of care had a 27% increase in odds compared to children who received a low level of care; families in SES quintile 4 had a 27% decrease in odds and families in SES quintile 5 had a 45% decrease in odds compared to families in SES quintile 1; children with one or more pre-episode of care visits had a 42% decrease in odds compared to children with no pre-episode of care visits; for every 1-year increase in age, there was an 8% decrease in odds.

Table 3.7

Multinomial Logistic Regression Predicting Post-Episode of Care Visits and Second Episode of Care in All Electronic Data Sample

	Post-episode of care visits [a] (n = 353)		Second episode of care [a] (n = 666)	
	Unadjusted OR	Adjusted OR	Unadjusted OR	Adjusted OR
Social content				
Child sex (females)[b]	1.03 (0.82 – 1.30)	0.88 (0.35 – 2.23)	0.98 (0.82 – 1.17)	0.56 (0.28 – 1.14)
Child age (years)	0.99 (0.95 – 1.04)	0.99 (0.94 – 1.05)	0.94 (0.91 – 0.97)**	0.92 (0.88 – 0.96)**
Child age and sex interaction	1.02 (0.93 – 1.11)	1.01 (0.93 – 1.11)	1.04 (0.98 – 1.12)	1.06 (0.99 – 1.13)
SES profile of neighborhood[c]				
Quintile 2	0.80 (0.57 – 1.14)	0.78 (0.54 – 1.11)	0.71 (0.54 – 0.92)**	0.81 (0.62 – 1.07)
Quintile 3	0.89 (0.64 – 1.24)	0.84 (0.60 – 1.18)	0.91 (0.72 – 1.16)	0.85 (0.66 – 1.08)
Quintile 4	0.89 (0.64 – 1.23)	0.87 (0.62 – 1.21)	0.70 (0.54 – 0.90)**	0.73 (0.56 – 0.95)*
Quintile 5	0.93 (0.63 – 1.38)	0.90 (0.60 – 1.35)	0.47 (0.33 – 0.66)**	0.55 (0.38 – 0.79)**
Parental marital status [d]				
Single – parent household	0.92 (0.74 – 1.36)	0.95 (0.73 – 1.22)	1.05 (0.85 – 1.29)	1.02 (0.83 – 1.26)
Unknown	1.00 (0.72 – 1.19)	1.04 (0.75 – 1.43)	2.11 (1.70 – 2.62)**	2.08 (1.64 – 2.63)**
Illness career				
Spacing of visits during the first episode of care (SD) [e]	1.00 (0.99 – 1.01)	1.00 (0.99 – 1.01)	0.99 (0.99 - 1.00)	0.99 (0.99 – 1.00)
Treatment system				
One or more pre-episode of care visits [f]	0.93 (0.62 – 1.40)	0.93 (0.61 – 1.40)	0.54 (0.37 – 0.79)**	0.58 (0.39 – 0.85)**
Number of visits in first episode of care[g]	0.99 (0.99 – 1.00)	0.99 (0.98 – 0.99)**	0.99 (0.99 – 1.00)	0.99 (0.99 – 1.00)
Level of care [h]				
Medium	1.20 (0.93 – 1.56)	1.32 (1.01 – 1.74)*	1.12 (0.92 – 1.37)	1.27 (1.02 – 1.58)*

	Post-episode of care visits [a] (n = 353)		Second episode of care [a] (n = 666)	
	Unadjusted OR	Adjusted OR	Unadjusted OR	Adjusted OR
High	0.95	0.98	0.97	1.04
	(0.62 – 1.44)	(0.64 – 1.51)	(0.71 – 1.33)	(0.75 – 1.43)
Very high	0.98	1.14	0.75	0.93
	(0.71 – 1.35)	(0.81 – 1.60)	(0.58 – 0.98)*	(0.70 – 1.24)

Note: SES = socio-economic status.
* p<.05 ** p<.01
[a] Reference category is the did not re-access group (n = 2380).
[b] Reference category is males.
[c] Reference category is quintile 1 (lowest income level).
[d] Reference category is two-parent household.
[e] Spacing of visits by 1 SD increase.
[f] Reference category is no pre-episode of care visits.
[g] Number of visits by 1 visit increase.
[h] Reference category is low level of care.

BCFPI sample. Table 3.8. presents the ORs and 95% confidence interval for each predictor, including the unadjusted and adjusted estimates. The full multinomial logistic regression model predicting re-accessing services provided an adequate fit based on the likelihood-ratio test ($p < .01$) and Pearson goodness-of-fit test ($p > .05$). the addition of illness career, but not treatment system variables improved the fit of the model. Appendix E summarizes the fit statistics for each step.

Two predictors were statistically significant in univariate analyses predicting post-episode of care visits: parental marital status and family burden; however, in the multivariate model, no variables were significant.

Four predictors were statistically significant in predicting a second episode of care: child age, SES profile of neighborhood, parental marital status, and spacing of visits during the first episode of care. In the multivariate model, families with unknown parental marital status had a 2.2-fold increase in odds compared to two-parent households; families with *T*-scores between 60 and 69 for family burden had a 55% increase in odds compared to families with *T*-scores <60; for every 1-year increase in age, there was a 13% decrease in odds; for every 1-SD increase in spacing of visits, there was a 1% decrease in odds.

Table 3.8

Multinomial Logistic Regression Predicting Post-Episode of Care Visits and Second Episode of Care in the BCFPI Sample

	Post-episode of care visits[a] (n = 172)		Second episode of care [a] (n = 362)	
	Unadjusted OR	Adjusted OR	Unadjusted OR	Adjusted OR
Social content				
Child sex (females)[b]	1.29 (0.93 – 1.79)	0.30 (0.07 – 1.41)	1.03 (0.81 – 1.32)	0.33 (0.10 – 1.06)
Child age (years)	0.98 (0.91 – 1.05)	0.92 (0.84 – 1.01)	0.91 (0.87 – 0.96)**	0.87 (0.81 – 0.93)**
Child and sex interaction	1.15 (0.99 – 1.33)	1.14 (0.99 – 1.32)	1.10 (0.99 – 1.22)	1.12 (0.99 – 1.25)
SES profile of neighborhood[c]				
Quintile 2	0.85 (0.51 – 1.42)	0.88 (0.52 – 1.51)	0.64 (0.45 – 0.90)**	0.78 (0.54 – 1.12)
Quintile 3	1.27 (0.79 – 2.04)	1.20 (0.74 – 1.95)	0.90 (0.63 – 1.25)	0.87 (0.62 – 1.23)
Quintile 4	1.36 (0.85 – 2.19)	1.32 (0.80 – 2.18)	0.82 (0.58 – 1.15)	0.90 (0.63 – 1.30)
Quintile 5	1.20 (0.68 – 2.13)	1.15 (0.62 – 2.15)	0.51 (0.31 – 0.81)**	0.71 (0.43 – 1.18)
Parental marital status [d]				
Single – parent household	0.63 (0.43 – 0.91)*	0.67 (0.45 – 1.00)	1.16 (0.87 – 1.56)	1.12 (0.83 – 1.52)
Unknown	0.95 (0.64 – 1.42)	0.97 (0.62 – 1.52)	2.10 (1.56 – 2.83)**	2.16 (1.52 – 3.04)**
Internalizing problems [e]				
T = 60-69	1.03 (0.70 – 1.52)	0.97 (0.65 – 1.45)	1.15 (0.86 – 1.55)	1.13 (0.82 – 1.54)
T = 70-79	0.75 (0.47 – 1.19)	0.69 (0.43 – 1.12)	1.01 (0.72 – 1.41)	0.95 (0.67 – 1.36)
T ≥ 80	0.71 (0.42 – 1.21)	0.69 (0.39 – 1.21)	1.37 (0.98 – 1.93)	1.29 (0.89 – 1.88)
Externalizing problems [e]				
T = 60-69	1.03 (0.64 – 1.68)	0.92 (0.55 – 1.54)	0.90 (0.64 – 1.27)	0.83 (0.57 – 1.21)
T = 70-79	1.06 (0.67 – 1.67)	0.95 (0.57 – 1.59)	1.00 (0.73 – 1.38)	0.87 (0.60 – 1.27)

	Post-episode of care visits[a] (n = 172)		Second episode of care [a] (n = 362)	
	Unadjusted OR	Adjusted OR	Unadjusted OR	Adjusted OR
T ≥ 80	1.45 (0.91 – 2.31)	1.33 (0.76 – 2.34)	1.13 (0.79 – 1.57)	1.03 (0.67 – 1.58)
Child impairment [e]				
T = 60-69	1.34 (0.87 – 2.05)	1.24 (0.79 – 1.97)	0.73 (0.67 – 1.32)	0.92 (0.64 – 1.32)
T = 70-79	0.90 (0.58 – 1.451	0.85 (0.51 – 1.40)	1.09 (0.80 – 1.48)	0.98 (0.68 – 1.40)
T ≥ 80	1.30 (0.83 – 2.02)	1.29 (0.74 – 2.24)	1.32 (0.96 – 1.82)	1.16 (0.77 – 1.75)
Illness career				
Family burden [e]				
T = 60-69	1.36 (0.79 – 2.33)	1.34 (0.76 – 2.37)	1.44 (0.99 – 2.09)	1.55 (1.04 – 2.32)**
T = 70-79	1.74 (1.04 – 2.91)*	1.78 (1.00- 3.18)	1.25 (0.85 – 1.83)	1.24 (0.81 – 1.90)
T ≥ 80	1.50 (0.93 – 2.41)	1.51 (0.84 – 2.71)	1.40 (0.99 – 1.95)	1.31 (0.86 – 1.99)
Spacing of visits during first episode of care (SD)[f]	1.00 (0.99- 1.01)	1.00 (0.99 – 1.01)	0.99 (0.98 – 0.99)*	0.99 (0.98 – 0.99)**
Treatment system				
One or more pre-episode of care visits [g]	0.79 (0.39 – 1.59)	0.75 (0.36 – 1.56)	0.57 (0.32 – 1.02)	0.64 (0.35 – 1.17)
Number of visits in first episode of care [h]	0.99 (0.98 – 1.00)	0.99 (0.98 – 1.00)	0.99 (0.98 – 1.00)	0.99 (0.98 – 1.00)
Level of care [i]				
Medium	1.18 (0.82 – 1.70)	1.32 (0.88 – 1.99)	1.04 (0.79 – 1.37)	1.31 (0.96 – 1.78)
High	0.93 (0.49 – 1.78)	1.07 (0.55 – 2.09)	1.09 (0.70 – 1.70)	1.36 (0.85 – 2.17)
Very high	0.80 (0.50 – 1.28)	0.98 (0.59 – 1.64)	0.72 (0.51 – 1.01)	0.95 (0.64 – 1.41)

Note: SES = socio-economic status.

* p<.05 ** p<.01

[a] Reference category is the did not re-access group (n = 1217).

[b] Reference category is males.

[c] Reference category is quintile 1 (lowest income level).

[d] Reference category is two-parent household.

[e] Reference category is T <60.
[f] Spacing of visits by 1 SD increase.
[g] Reference category is no pre-episode of care visits.
[h] Number of visits by 1 visit increase.
[I] Reference category is low level of care.

Chart review sample. Table 3.9 presents the ORs and 95% confidence intervals for each predictor, including unadjusted and adjusted estimates. Too few children had pre-episode of care visits, therefore, the variable was excluded as a predictor. SES profile of neighborhood quintiles 4 and 5, and high and very high levels of care were merged due to a small number of observations in these categories. Only variables that were significant in the univariate analyses were included in the multivariate model due to the small sample size.

The full multinomial logistic regression model predicting re-accessing services provided an adequate fit based on the likelihood-ratio test ($p < .01$) and Pearson goodness-of-fit test ($p > .05$). The addition of social support system, but not treatment system variables improved the fit of the model. Appendix E summarizes the fit statistics for each step.

Three predictors were statistically significant in predicting post-episode of care visits: child sex, child welfare involvement, and level of care. In the multivariate model, females had a 2.5-fold increase in odds compared to males; families with child welfare involvement had a 68% decrease in odds compared to families with no child welfare involvement; children who received a high/very high level of care had a 66% decrease in odds compared to children who received a low level of care.

Three predictors were statistically significant in predicting a second episode of care: child age, parental marital status, and child strengths at intake. Three predictors were statistically significant in predicting a second episode of care: child age, parental marital status, and child strengths at intake. In the multivariate model, children who received a high/very high level of care had a 48% decrease in odds compared to children who received a low level of care; for every 1-year increase in age, there was a 12% decrease in odds.

Table 3.9

Multinomial Logistic Regression Predicting Post-Episode of Care Visits and Second Episode of Care in the Chart Review Sample

		Post-episode of care visits[a] (n = 46)		Second episode of care [a] (n = 94)	
		Unadjusted OR	Adjusted OR	Unadjusted OR	Adjusted OR
Social content					
Child sex (females)[b]		2.48 (1.31 – 4.68)**	2.53 (1.31 – 4.90)**	0.86 (0.53 – 1.40)	0.86 (0.52 – 1.43)
Child age (years)		0.97 (0.86 – 1.10)	0.93 (0.82 – 1.07)	0.88 (0.80 – 0.97)**	0.88 (0.80 – 0.97)*
Child and sex interaction		0.80 (0.62 – 1.05)		0.90 (0.74 – 1.09)	
SES profile of neighborhood[c]					
	Quintile 2	0.48 (0.18 – 1.30)		0.73 (0.37 – 1.43)	
	Quintile 3	0.88 (0.37 – 2.08)		0.99 (0.52 – 1.89)	
	Quintile 4-5	0.81 (0.35 – 1.85)		0.60 (0.31 – 1.16)	
Parental marital status [d]					
	Single – parent household	0.59 (0.26 – 1.34)	0.78 (0.33 – 1.81)	1.10 (0.61 – 1.99)	1.18 (0.64 – 2.19)
	Unknown	1.24 (0.60 – 2.54)	1.41 (0.63 – 3.19)	1.95 (1.10 – 3.42)*	1.51 (0.82 – 2.81)
History of abuse or neglect [e]		0.91 (0.49 – 1.69)		1.14 (0.71 – 1.81)	
Internalizing problems [f]	Intake	1.05 (0.99 – 1.11)		1.00 (0.95 – 1.05)	
	Discharge	1.04 (0.96 – 1.12)		1.00 (0.95 – 1.06)	
Externalizing problems [f]	Intake	1.02 (0.96 – 1.09)		0.99 (0.95 – 1.04)	
	Discharge	1.01 (0.95 – 1.07)		0.99 (0.95 – 1.04)	
Child impairment [f]	Intake	1.03 (0.95 – 1.11)		0.99 (0.93 – 1.05)	
	Discharge	0.97 (0.90 – 1.06)		0.99 (0.94 – 1.06)	
Child strengths [f]	Intake	1.01 (0.94 – 1.08)	1.04 (0.97 – 1.13)	0.93 (0.89 – 0.98)*	0.95 (0.90 – 1.00)

		Post-episode of care visits[a] (n = 46)		Second episode of care [a] (n = 94)	
		Unadjusted OR	Adjusted OR	Unadjusted OR	Adjusted OR
	Discharge	0.99 (0.92 – 1.06)		0.95 (0.90 – 1.00)	
Child relationship strengths [f]	Intake	0.97 (0.91 – 1.04)		1.01 (0.96 – 1.06)	
	Discharge	0.98 (0.91 – 1.05)		1.03 (0.98 – 1.08)	
Caregiver needs and strengths [f]	Intake	0.93 (0.84 – 1.03)		1.04 (0.97 – 1.12)	
	Discharge	0.93 (0.84 – 1.03)		1.00 (0.94 – 1.08)	
Care intensity and organization [f]	Intake	0.98 (0.88 – 1.09)		0.97 (0.90 – 1.05)	
	Discharge	0.98 (0.91 – 1.06)		0.97 (0.92 – 1.03)	
Social support system					
Child welfare involvement [g]		0.35 (0.16 – 0.74)**	0.32 (0.14 – 0.71)**	1.07 (0.67 – 1.70)	0.96 (0.59 – 1.58)
Illness career					
Spacing of visits during first episode of care (SD)[h]		1.00 (0.98 – 1.02)		1.00 (0.99 – 1.02)	
Disposition at discharge [i]					
	Dropped out	0.45 (0.17 – 1.22)		0.65 (0.34 – 1.23)	
Treatment system					
Number of visits in first episode of care [j]		0.99 (0.98 – 1.01)		0.99 (0.98 – 1.00)	
Level of care [k]					
	Medium	0.66 (0.33 – 1.33)	0.77 (0.37 – 1.62)	0.61 (0.35 – 1.05)	0.62 (0.35 – 1.12)
	High/Very high	0.30 (0.12 – 0.73)**	0.34 (0.13 – 0.88)*	0.48 (0.27 – 0.88)	0.52 (0.28 – 0.99)*

Note: SES = socio-economic status.

* p<.05 ** p<.01

[a] Reference category is the did not re-access group (n = 286).

[b] Reference category is males.

[c] Reference category is quintile 1 (lowest income level).

[d] Reference category is two-parent household.

[e] Reference group is no reported abuse or neglect.

[f] CANS scores by 1 unit increase.

[g] Reference group is no child welfare involvement.

[h] Spacing of visits by 1 SD increase.

[i] Reference category is all other dispositions at discharge (e.g., completed treatment, treatment ongoing).

[j] Number of visits by 1 visit increase.

[k] Reference category is low level of care.

3.4 Predictors of Time to Re-Access Services

The third objective was to identify predictors of the time to re-access services. Cox regressions were utilized to generate models that predict time to re-access services. Survival curves showing the probability of not re-accessing services as a function of time in months are presented in Figures 3.2. and 3.3. The curves for the three samples were similar, therefore, only the curves for all electronic data sample are presented. See Appendix F for the curves in the BCFPI and chart review sample.

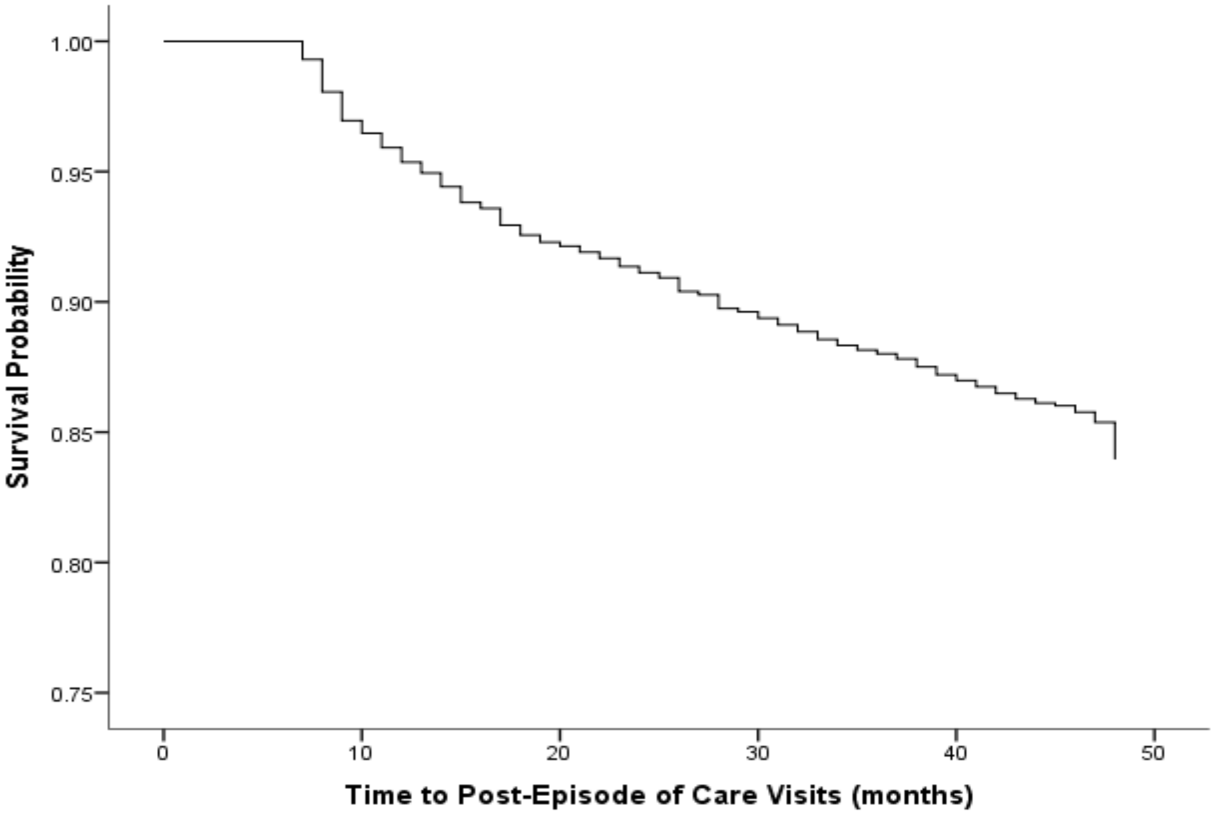

Figure 3.2. Survival curve showing the probability of not having post-episode of care visits as a function of time in months for all the electronic data. Time to post-episode of care visits ranged from 6 to 48 months (M= 18.94, median = 16.00, SD = 11.30). Half of the sample re-accessed care by 15 months.

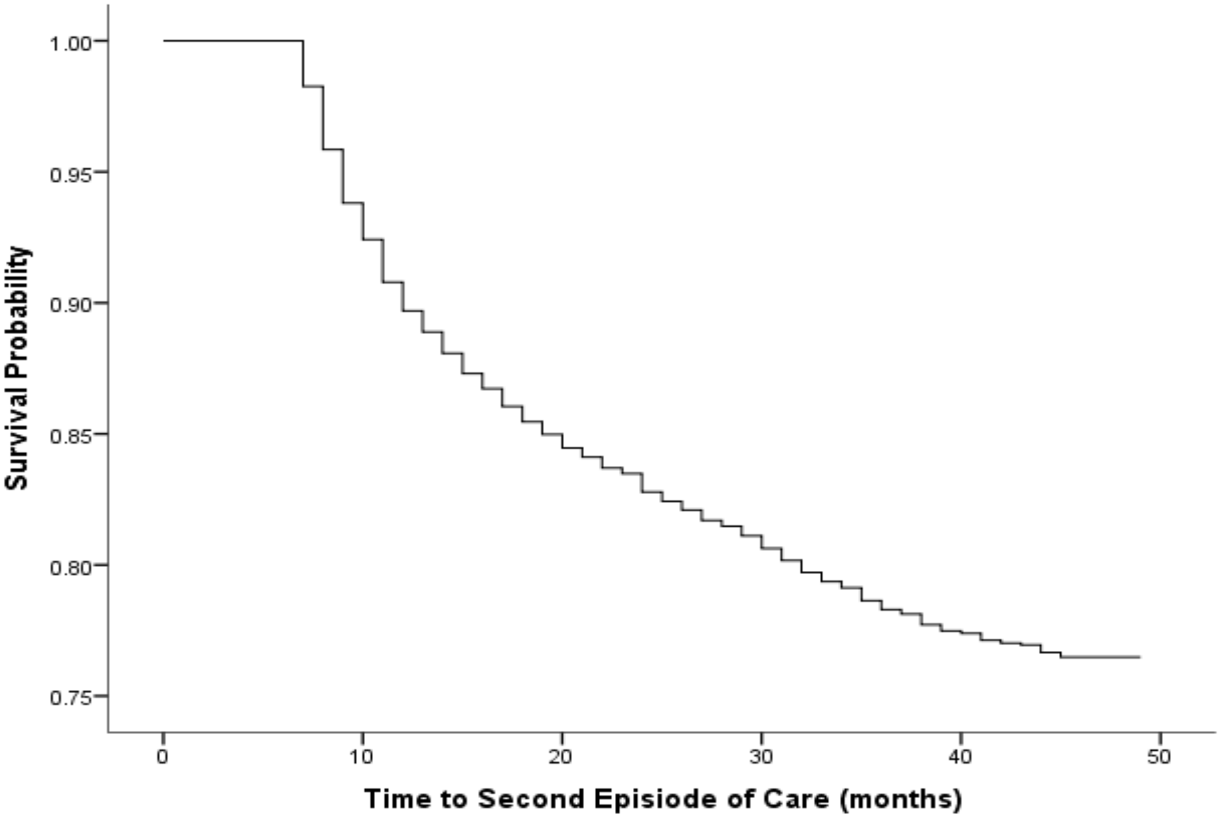

Figure 3.3. Survival curve showing the probability of not having a second episode of care as a function of time in months for all the electronic data. Time to second episode of care ranged from 6 to 44 months (M = 16.11, median = 12.00, SD = 9.77). Half of the sample re-accessed care by 12 months.

All electronic data sample. Table 3.10 presents the HRs and 95% confidence interval for each predictor, including the unadjusted and adjusted estimates. The full cox regression model predicting post-episode of care visits did not provide an adequate fit based on the omnibus test ($p > .05$). Illness career and treatment system variables did not improve the fit of the model. The full cox regression model predicting second episode of care visits provided an adequate fit based on the omnibus test ($p < .01$). Illness career and treatment system variables did not improve the fit of the model. Appendix G summarizes the fit statistics for each step.

One predictor was statistically significant in predicting time to post-episode of care visits: level of care. In the multivariate model, children who received a medium level of care had a 31% increase in risk compared to children who received a low level of care.

Three predictors were statistically significant in predicting time to a second episode of care: child age, SES profile of neighborhood, and parental marital status. In the multivariate model, families with unknown parental marital status had a 90% increase in risk compared to two-parent households; children who received a medium level of care had a 22% increase in risk compared to children who received a low level of care; families in SES quintile 4 had a 24% decrease in risk and families in SES quintile 5 had a 42% decrease in risk compared to families in SES quintile 1; for every 1-year increase in age, there was a 7% decrease in risk.

Table 3.10

Cox Regression Predicting Time to Post-Episode of Care Visits and Second Episode of Care in All Electronic Data Sample

	Post-episode of care visits[a] (n = 353)		Second episode of care [a] (n = 666)	
	Unadjusted HR	Adjusted HR	Unadjusted HR	Adjusted HR
Social content				
Child sex (females) [b]	1.01 (0.81 – 1.26)	0.87 (0.37 – 2.07)	0.97 (0.83 – 1.14)	0.61 (0.33 – 1.12)
Child age (years)	1.00 (0.96 – 1.05)	0.99 (0.94 – 1.05)	0.95 (0.92 – 0.98)**	0.93 (0.90 – 0.97)**
Child and sex interaction	1.02 (0.94 – 1.11)	1.02 (0.93 – 1.10)	1.04 (0.98 – 1.11)	1.05 (0.99 – 1.12)
SES profile of neighborhood[c]				
Quintile 2	0.82 (0.59 – 1.13)	0.80 (0.57 – 1.11)	0.71 (0.57 – 0.90)**	0.82 (0.64 – 1.03)
Quintile 3	0.89 (0.65 – 1.20)	0.86 (0.63 – 1.18)	0.91 (0.74 – 1.12)	0.86 (0.70 – 1.07)
Quintile 4	0.89 (0.65 – 1.21)	0.88 (0.64 – 1.20)	0.72 (0.58 – 0.90)**	0.76 (0.60 – 0.95)*
Quintile 5	0.91 (0.63 – 1.30)	0.92 (0.63 – 1.33)	0.50 (0.36 – 0.67)**	0.58 (0.42 – 0.80)**
Parental marital status[d]				
Single – parent household	0.94 (0.74 – 1.18)	0.93 (0.73 – 1.18)	1.06 (0.88 – 1.28)	1.01 (0.84 – 1.23)
Unknown	1.03 (0.78 – 1.37)	1.05 (0.78 – 1.41)	1.97 (1.63 – 2.38)**	1.90 (1.56 – 2.32)**
Illness career				
Spacing of visits during first episode of care (SD)[e]	1.01 (0.99 – 1.01)	1.00 (0.99 – 1.01)	1.00 (0.99 – 1.00)	0.99 (0.99 – 1.00)
Treatment system				
One or more pre-episode of care visits [f]	1.40 (0.96 – 2.05)	1.42 (0.96 – 2.10)	0.77 (0.54 – 1.09)	0.82 (0.58 – 1.17)
Number of visits in first episode of care [g]	1.00 (0.99 – 1.01)	1.00 (0.99 – 1.01)	1.00 (0.99 – 1.01)	1.00 (0.99 – 1.01)

	Post-episode of care visits[a] (n = 353)		Second episode of care [a] (n = 666)	
	Unadjusted HR	Adjusted HR	Unadjusted HR	Adjusted HR
Social content				
Level of care [h]				
Medium	1.28 (1.01 – 1.63)*	1.31 (1.01 – 1.68)*	1.15 (0.97 – 1.37)	1.22 (1.01 – 1.46)*
High	0.93 (0.66 – 1.39)	0.95 (0.64 – 1.42)	0.96 (0.73 – 1.27)	0.99 (0.75 – 1.32)
Very high	1.06 (0.78 – 1.43)	1.11 (0.80 – 1.53)	0.82 (0.65 – 1.04)	0.90 (0.70 – 1.17)

Note: SES = socio-economic status.
* p<.05 ** p<.01
[a] Cases censored (n = 2380).
[b] Reference category is males.
[c] Reference category is quintile 1 (lowest income level).
[d] Reference category is two-parent household.
[e] Spacing of visits by 1 SD increase.
[f] Reference category is no pre-episode of care visits.
[g] Number of visits by 1 visit increase.
[h] Reference category is low level of care.

BCFPI sample. Table 3.11 presents the HR and 95% confidence interval for each predictor, including the unadjusted and adjusted estimates. The full cox regression model predicting post-episode of care visits did not provide an adequate fit based on the omnibus test ($p > .05$). Illness career and treatment system variables did not improve the fit of the model.

The full cox regression model predicting second episode of care visits provided an adequate fit based on the omnibus test ($p < .01$). Illness career, but not treatment system variables, improved the fit of the model. Appendix G summarizes the fit statistics for each step.

Three predictors were statistically significant in predicting time to post-episode of care visits: child age and sex interaction, parental marital status, and family burden. In the multivariate model, children in single-parent households had a 32% decrease in risk compared to two-parent households.

Six predictors were statistically significant in predicting time to a second episode of care: child age, SES, parental marital status, internalizing problems, family burden, and spacing of visits during the first episode of care. In the multivariate model, families with unknown parental marital status had a 91% increase in risk compared to two-parent households; families with *T*-scores between 60 and 69 for family burden had a 50% increase in risk compared to families with *T*-scores < 60; for every 1-year increase in age, there was an 11% decrease in risk; for every 1-SD increase in spacing of visits, there was a 1% decrease in risk.

Table 3.11

Cox Regression Predicting Time to Post-Episode of Care Visits and Second Episode of Care in the BCFPI Sample

	Post-episode of care visits[a] (n = 172)		Second episode of care [a] (n = 362)	
	Unadjusted HR	Adjusted HR	Unadjusted HR	Adjusted HR
Social content				
Child sex	1.27	0.32	1.02	0.38
(females)[b]	(0.94 – 1.72)	(0.08 – 1.33)	(0.82 – 1.26)	(0.14 – 1.02)
Child age (years)	0.98	0.93	0.93	0.89
	(0.92 – 1.05)	(0.85 – 1.02)	(0.89 – 0.97)**	(0.83 – 0.94)**
Child and sex	1.15	1.14	1.09	1.10
interaction	(1.00 – 1.32)*	(0.99 – 1.30)	(0.99 – 1.24)	(1.00 – 1.22)
SES profile of neighborhood[c]				
Quintile 2	0.85	0.89	0.65	0.78
	(0.52 – 1.39)	(0.54 – 1.48)	(0.48 – 0.89)**	(0.56 – 1.07)
Quintile 3	1.24	1.21	0.91	0.91
	(0.80 – 1.92)	(0.77 – 1.91)	(0.69 – 1.21)	(0.68 – 1.21)
Quintile 4	1.35	1.32	0.84	0.91
	(0.87 – 2.11)	(0.83 – 2.09)	(0.62 – 1.13)	(0.67 – 1.23)
Quintile 5	1.17	1.14	0.53	0.72
	(0.68 – 2.01)	(0.64 – 2.03)	(0.35 – 0.82)**	(0.46 – 1.14)
Parental marital status [d]				
Single – parent	0.64	0.68	1.14	1.08
household	(0.45 – 0.91)*	(0.47 – 0.99)*	(0.88 – 1.48)	(0.82 – 1.41)
Unknown	0.95	0.99	1.91	1.91
	(0.66 – 1.38)	(0.66 – 1.50)	(1.48 – 2.48)**	(1.43 – 2.55)**
Internalizing problems [e]				
T = 60-69	1.02	0.98	1.14	1.11
	(0.71 – 1.47)	(0.68 – 1.42)	(0.88 – 1.48)	(0.85 – 1.45)
T = 70-79	0.77	0.72	1.03	0.97
	(0.50 – 1.20)	(0.46 – 1.13)	(0.77 – 1.39)	(0.72 – 1.32)
T ≥ 80	0.75	0.74	1.36	1.24
	(0.46 – 1.24)	(0.43 – 1.25)	(1.02 – 1.83)*	(0.90 – 1.71)
Externalizing problems [e]				
T = 60-69	1.06	0.94	0.93	0.84
	(0.67 – 1.67)	(0.58 – 1.52)	(0.68 – 1.26)	(0.61 – 1.16)
T = 70-79	1.08	0.96	1.02	0.87
	(0.71 – 1.66)	(0.59 – 1.55)	(0.77 – 1.35)	(0.63 – 1.19)

	Post-episode of care visits[a] (n = 172)		Second episode of care [a] (n = 362)	
	Unadjusted HR	Adjusted HR	Unadjusted HR	Adjusted HR
T ≥ 80	1.48	1.32	1.15	1.03
	(0.96 – 2.29)	(0.78 – 2.22)	(0.85 – 1.56)	(0.71 – 1.49)
Child impairment[e]				
T = 60-69	1.33	1.22	0.96	0.92
	(0.89 – 1.98)	(0.80 – 1.87)	(0.71 – 1.29)	(0.67 – 1.26)
T = 70-79	0.94	0.88	1.10	0.97
	(0.61 – 1.43)	(0.55 – 1.41)	(0.84 – 1.44)	(0.71 – 1.32)
T ≥ 80	1.32	1.23	1.32	1.09
	(0.87 – 2.00)	(0.74 – 2.04)	(0.98 – 1.75)	(0.78 – 1.54)
Illness career				
Family burden [e]				
T = 60-69	1.36	1.31	1.39	1.50
	(0.81 – 2.26)	(0.76 – 2.24)	(1.00 – 1.94)	(1.06 – 2.12)*
T = 70-79	1.70	1.68	1.24	1.23
	(1.05 – 2.76)*	(0.99 – 2.88)	(0.88 – 1.75)	(0.85 – 1.79)
T ≥ 80	1.52	1.43	1.40	1.30
	(0.96 – 2.38)	(0.83 – 2.47)	(1.04 – 1.89)*	(0.90 – 1.88)
Spacing of visits during first episode of care (SD)[f]	1.01	1.00	0.99	0.99
	(0.99 – 1.02)	(0.99 – 1.01)	(0.97 – 1.00)*	(0.98 – 0.99)*
Treatment system				
One or more pre-episode of care visits [g]	1.28	1.27	0.87	0.97
	(0.65 – 2.50)	(0.63 – 2.53)	(0.51 – 1.48)	(0.56 – 1.68)
Number of visits in first episode of care [h]	1.00	0.99	1.00	1.00
	(0.99 – 1.01)	(0.99 – 1.01)	(0.99 – 1.01)	(0.99 – 1.01)
Level of care [i]				
Medium	1.26	1.32	1.10	1.25
	(0.90 – 1.77)	(0.91 – 1.91)	(0.86 – 1.39)	(0.96 – 1.63)
High	0.92	1.03	1.04	1.23
	(0.50 – 1.70)	(0.55 – 1.92)	(0.71 – 1.52)	(0.83 – 1.83)
Very high	0.89	0.96	0.80	0.95
	(0.57 – 1.39)	(0.59 – 1.57)	(0.58 – 1.09)	(0.67 – 1.35)

Note: SES = socio-economic status.

* p<.05 ** p<.01

[a] Cases censored (n = 1217).

[b] Reference category is males.

[c] Reference category is quintile 1 (lowest income level).

[d] Reference category is two-parent household.

[e] Reference category is T <60.
[f] Spacing of visits by 1 SD increase.
[g] Reference category is no pre-episode of care visits.
[h] Number of visits 1 visit increase.
[i] Reference category is low level of care.

Chart review sample. Table 3.12 presents the HR and 95% confidence interval for each predictor, including the unadjusted and adjusted estimates. Too few children had pre-episode of care visits, therefore, the variable was excluded as a predictor. SES profile of neighborhood quintiles 4 and 5, and high and very high levels of care were merged due to a small number of observations in these categories. Only variables that were significant in the univariate analyses were included in the multivariate model due to the small sample size.

The full cox regression model predicting post-episode of care visits provided an adequate fit based on the omnibus test ($p < .01$). Social support system and treatment system variables improved the fit of the model. The full cox regression model predicting second episode of care visits provided an adequate fit based on the omnibus test ($p < .01$). Treatment system, but not illness career, variables improved the fit of the model. Appendix G summarizes the fit statistics for each step.

Three predictors were statistically significant in predicting time to post-episode of care visits: child sex, child welfare involvement, and levels of care. In the multivariate model, females had a 2-fold increase in risk compared to males; families with child welfare involvement had a 67% decrease in risk compared to families with no child welfare involvement; children who received a high/very high level of care had a 74% decrease in risk compared to children who received a low level of care.

Six predictors were statistically significant in predicting time to a second episode of care: child age, SES profile of neighborhood, parental marital status, child strengths (intake and discharge), disposition at discharge, and levels of care. In the multivariate model, families with unknown parental marital status had a 2.4-fold increase in risk compared to two-parent households; for every 1-year increase in age, there was a 12% decrease in risk; for every 1-unit increase in the CANS child strengths scores at intake, there was a 6% decrease in risk; children who dropped out had a 62% decrease in risk compared to all other dispositions at discharge; children who received a medium level of care had a 51% decrease in risk and children who received a high/very high level of care had a 58% decrease in risk compared to children who received a low level of care.

Table 3.12

Cox Regression Predicting Time to Post-Episode of Care Visits and Second Episode of Care in the Chart Review Sample

		Post-episode of care visits [a] (n = 42)		Second episode of care [a] (n = 85)	
		Unadjusted OR	Adjusted OR	Unadjusted OR	Adjusted OR
Social content					
Child sex (females)[b]		2.33 (1.26 – 4.31)**	2.09 (1.12 – 3.89)**	0.89 (0.56 – 1.40)	
Child age (years)		0.96 (0.85 – 1.09)		0.86 (0.79 – 0.94)**	0.88 (0.80 – 0.97)*
Child and sex interaction		0.78 (0.60 – 1.02)		0.91 (0.77 – 1.09)	
SES profile of neighborhood[c]					
	Quintile 2	0.51 (0.19 – 1.38)		0.70 (0.38 – 1.28)	1.14 (0.59 – 2.23)
	Quintile 3	0.92 (0.40 – 2.11)		0.98 (0.56 – 1.70)	1.03 (0.58 – 1.85)
	Quintile 4-5	0.97 (0.44 – 2.13)		0.53 (0.28 – 0.99)*	0.59 (0.31 – 1.23)
Parental marital status [d]					
Single – parent household		0.75 (0.34 – 1.65)		1.09 (0.57 – 2.09)	1.22 (0.62 – 2.39)
Unknown		1.36 (0.68 – 2.71)		3.03 (1.78 – 5.16)**	2.42 (1.38 – 4.25)**
History of abuse or neglect [e]		0.84 (0.46 – 1.55)		1.20 (0.78 – 1.83)	
Internalizing problems[f]	Intake	1.05 (0.99 – 1.11)		0.99 (0.95 – 1.04)	
	Discharge	1.02 (0.95 – 1.10)		0.99 (0.94 – 1.05)	
Externalizing problems[f]	Intake	1.02 (0.96 – 1.08		0.99 (0.96 – 1.04)	
	Discharge	1.00 (0.95 – 1.06)		0.99 (0.96 – 1.04)	
Child impairment[f]	Intake	1.04 (0.97 – 1.12)		1.00 (0.95 – 1.06)	
	Discharge	0.96 (0.89 – 1.04)		0.99 (0.94 – 1.04)	
Child strengths[f]	Intake	0.99 (0.93 – 1.06)		0.91 (0.86 – 0.95)**	0.94 (0.88 – 0.99)*

		Post-episode of care visits [a] (n = 42)		Second episode of care [a] (n = 85)	
		Unadjusted OR	Adjusted OR	Unadjusted OR	Adjusted OR
	Discharge	0.98 (0.91 – 1.05)		0.92 (0.87 – 0.97)**	0.97 (0.91 – 1.03)
Child relationship strengths[f]	Intake	0.95 (0.89 – 1.02)		1.02 (0.97 – 1.06)	
	Discharge	0.97 (0.91 – 1.03)		1.04 (0.99 – 1.09)	
Caregiver needs and strengths[f]	Intake	0.94 (0.85 – 1.04)		1.04 (0.97 – 1.10)	
	Discharge	0.94 (0.85 – 1.04)		1.01 (0.95 – 1.08)	
Care intensity and organization[f]	Intake	0.99 (0.88 – 1.10)		0.98 (0.91 – 1.06)	
	Discharge	0.97 (0.89 – 1.05)		0.97 (0.92 – 1.02)	
Social support system					
Child welfare involvement [g]		0.31 (0.14 – 0.70)**	0.33 (0.15 – 0.74)**	1.09 (0.71 – 1.67)	
Illness career					
Spacing of visits during first episode of care (SD)[h]		1.01 (0.99 – 1.03)		1.01 (0.99 – 1.02)	
Disposition at discharge [k]					
	Dropped out	0.38 (0.14 – 1.07)		0.51 (0.26 – 0.98)*	0.38 (0.24 – 0.95)**
Treatment system					
Number of visits in first episode of care [i]		0.99 (0.97 – 1.01)		0.99 (0.98 – 1.01)	
Level of care [j]					
	Medium	0.64 (0.34 – 1.24)	0.67 (0.35 – 1.29)	0.49 (0.30 – 0.82)**	0.49 (0.28 – 0.85)*
	High/Very high	0.25 (0.09 – 0.65)**	0.26 (0.10 – 0.68)*	0.41 (0.24 – 0.72)**	0.42 (0.23 – 0.78)**

Note: SES = socio-economic status.

* p<.05 ** p<.01

[a] Censored visits n = 267.

[b] Reference category is males.

[c] Reference category is quintile 1 (lowest income level).

[d] Reference category is two-parent household.

[e] Reference group is no reported abuse or neglect.

[f] CANS scores by 1 unit increase.

[g] Reference group is no child welfare involvement.

[h] Spacing of visits by 1 SD increase.
[i] Reference category is all other dispositions at discharge (e.g., completed treatment, treatment ongoing).
[j] Number of visits by 1 visit increase.
[k] Reference category is low level of care.

3.5 Summary of Multinomial Logistic Regression and Cox Regression Analyses

To facilitate the interpretation of results Table 3.13 and 3.14 provide a summary of all analyses conducted in the three samples.

Table 3.13

Summary of the Significant Predictors for Post-Episode of Care Visits

	Presence or absence of post-episode of care visits			Time to post-episode of care visits		
	All electronic data sample (n = 353)	BCFPI sample (n = 172)	Chart review sample (n = 46)	All electronic data sample (n = 353)	BCFPI sample (n = 172)	Chart review sample (n = 42)
	OR	OR	OR	HR	HR	HR
Social content						
Child sex (females) [a]	-ns-	-ns-	2.53 (1.31 – 4.90)**	-ns-	-ns-	2.09 (1.12 – 3.89)**
Parental marital status [b]						
Single – parent household	-ns-	-ns-	-ns-	-ns-	0.68 (0.47 – 0.99)*	-ns-
Social support system						
Child welfare involvement [c]	-n/a-	-n/a-	0.32 (0.14 – 0.71)**	-n/a-	-n/a-	0.33 (0.15 – 0.74)**
Treatment system						
Number of visits in first episode of care [d]	0.99 (0.98 – 0.99)**	-ns-	-ns-	-ns-	-ns-	-ns-
Level of care [e]						
Medium	1.32 (1.01 – 1.74)*	-ns-	-ns-	1.31 (1.01 – 1.68)*	-ns-	-ns-
High or Very high	-ns-	-ns-	0.34 (0.13 – 0.88)*	-ns-	-ns-	0.26 (0.10 – 0.68)*

Note: -ns- = not significant; -n/a- = variable not available in the sample; chart review sample size in the multinomial logistic and cox regression differ because rounded normalized weights were required for the cox regression. * p<.05 ** p<.01

[a] Reference category is males.

[b] Reference category is two-parent household.

[c] Reference group is no child welfare involvement.

[d] Number of visits by 1 visit increase.

[e] Reference category is low level of care. High and very high levels were combined in the chart review sample.

Table 3.14

Summary of the Significant Predictors for Second Episode of Care

	Presence or absence of a second episode of care			Time to second episode of care		
	All electronic data sample (n = 666)	BCFPI sample (n = 362)	Chart review sample (n = 94)	All electronic data sample (n = 666)	BCFPI sample (n = 362)	Chart review sample (n = 85)
	OR	OR	OR	HR	HR	HR
Social content						
Child age (years) [a]	0.92 (0.88 – 0.96)**	0.87 (0.81 – 0.93)**	0.88 (0.80 – 0.97)*	0.93 (0.90 – 0.97)**	0.89 (0.83 – 0.94)**	0.88 (0.80 – 0.97)*
SES profile of neighborhood [b]						
Quintile 4	0.73 (0.56 – 0.95)*	-ns-	-ns-	0.76 (0.60 – 0.95)*	-ns-	-ns-
Quintile 5	0.55 (0.38 – 0.79)**	-ns-	-ns-	0.58 (0.42 – 0.80)**	-ns-	-ns-
Parental marital status [c]						
Unknown	2.08 (1.64 – 2.63)**	2.16 (1.52 – 3.04)**	-ns-	1.90 (1.56 – 2.32)**	1.91 (1.43 – 2.55)**	2.42 (1.38 – 4.25)**
Child strengths at intake [d]	-n/a-	-n/a-	-ns-	-n/a-	-n/a-	0.94 (0.88 – 0.99)*
Illness career						
Family burden [e]						
T = 60-69	-n/a-	1.55 (1.04 – 2.32)**	-n/a-	-n/a-	1.50 (1.06 – 2.12)*	-n/a-
Spacing of visits during first episode of care (SD) [e]	-ns-	0.99 (0.98 – 0.99)**	-ns-	-ns-	0.99 (0.98 – 0.99)*	-ns-

	Presence or absence of second episode of care			Time to second episode of care		
	All electronic data sample (n = 666)	BCFPI sample (n = 362)	Chart review sample (n = 94)	All electronic data sample (n = 666)	BCFPI sample (n = 362)	Chart review sample (n = 85)
	OR	OR	OR	HR	HR	HR
Disposition at discharge [f]						
Dropped out	-n/a-	-n/a-	-ns-	-n/a-	-n/a-	0.38 (0.24 – 0.95)**
Treatment system						
One or more pre-episode of care visits [g]	0.58 (0.39 – 0.85)**	-ns-	-n/a-	-ns-	-ns-	-n/a-
Level of care [h]						
Medium	1.27 (1.02 – 1.58)*	-ns-	-ns-	1.22 (1.01 – 1.46)*	-ns-	0.49 (0.28 – 0.85)*
High/Very high	-ns-	-ns-	0.52 (0.28 – 0.99)*	-ns-	-ns-	0.42 (0.23 – 0.78)**

Note: SES = socio-economic status; -n/a- = variable not available in the sample; chart review sample size in the multinomial logistic and cox regression differ because rounded normalized weights were required for the cox regression.

* $p<.05$ ** $p<.01$

[a] Reference category is quintile 1 (lowest income level).

[b] Reference category is two-parent household.

[c] CANS scores by 1 unit increase

[d] Reference category is T <60.

[e] Spacing of visits by 1 SD increase.

[f] Reference category is all other dispositions at discharge (e.g., completed treatment, treatment ongoing).

[g] Reference category is no pre-episode of care visits.

[h] Reference category is low level of care.

3.6 Supplementary Analyses

The following sections outline supplementary analyses that were conducted to gain a better understanding of the findings from the multinomial logistic regressions and cox regressions.

Child Sex. Females (vs. males) had higher odds and higher risk of post-episode of care visits, but only in the chart review sample. A possible explanation might be that females had higher psychopathology, impairment, or needs than males. A MANOVA was conducted in the chart review sample with internalizing problems at discharge, externalizing problems at discharge, and child impairment at discharge as dependent variables, and child sex as the independent variable. The results showed that psychopathology and impairment differed among males and females (Wilk's lambda F (3, 390) = 17.14 $p<.001$), but not as was expected. Specifically, males had higher externalizing problems ($p<.001$) and impairment ($p<.001$) than females (see Table 3.15 for the means). This indicates that psychopathology and impairment do not account for this finding.

Table 3.15

Psychopathology and Impairment Among Females and Males in the Chart Review Sample

CANS Subscales	Females M (SD)	Males M (SD)	*F*	*p*
Child impairment	2.99 (3.45)	5.13 (4.12)	27.57	< .001
Internalizing problems	4.47 (3.87)	4.08 (4.03)	1.36	.25
Externalizing problems	4.79 (4.38)	7.46 (5.63)	25.69	< .001

Child age. Younger children had higher odds and higher risk of a second episode of care in all samples. One concern might be that older children were simply unable to re-access CAMH agencies because they had aged out of care (i.e., at or near 18 years of age). The age at the end of the first episode of care was calculated for all participants in the study sample and the frequencies were examined. Results showed that less than 1% of children were 16 years old or older at the end of the first episode of care. This indicates that aging out of care does not account for this finding.

A possible explanation might be than younger children have more severe psychopathology or impairment. The correlations between age and psychopathology variables were examined in the BCFPI subsample. Results showed very small correlations with age: externalizing problems r = 0.07, internalizing problems r = -0.01, child impairment r = -0.08. This indicates that psychopathology and impairment does not account for this finding.

Another possibility is that older children might have been more likely to be referred to other services, compared to younger children. Referral to other services was one of the dispositions at discharge coded in the chart review sample. To examine this hypothesis, disposition at discharge was coded as follows: 0 = referred to other services; 1 = all other dispositions at discharge. A *t*-test was conducted to determine if the mean age was different in children who were referred to other services versus all other dispositions at discharge. Results showed that there was no difference in age between groups [*t* (424) = 0.25, p = .80]. This indicates that being referred to other services does not account for this finding.

SES profile of neighborhood. Families in quintiles 4 and 5 (vs. quintile 1) had lower odds and lower risk of a second episode of care in the all electronic data sample. One possible explanation is that children in quintiles 4 and 5 had lower psychopathology and impairment than children in quintile 1. A MANOVA was conducted in the BCFPI sample with internalizing problems, externalizing problems, and child impairment as dependent variables and SES profile of the neighborhood as the independent variable. The results showed that psychopathology and impairment differed among quintiles [Wilk's lambda *F* (12, 4614.48) = 6.09 p<.001]. Specifically, children in quintile 1 had significantly more externalizing problems and impairment than children in quintile 4; children in quintiles 1 had significantly more externalizing problems, internalizing problems, and impairment than children in quintile 5 (see Table 3.16 for the results of all post-hoc tests). This indicates that psychopathology and impairment (at least) partly account for this finding.

Table 3.16

Results of the Multivariate Analysis of Variance Post-Hoc Tests for SES Profile of Neighborhood and BCFPI Variables

SES profile of neighborhood	BCFPI Scales Externalizing problems	Internalizing problems	Child impairment
Quintile 1	71.93 (12.64)	65.67 (14.70)	70.83 (14.76) [b]
Quintile 2	69.63 (13.53)	64.18 (14.67)	67.73 (14.35)[a b]
Quintile 3	68.42 (13.20)[a]	63.50 (13.79)	68.01 (14.55)[a b]
Quintile 4	69.27 (12.93)[a]	63.76 (14.20)	66.73 (13.61)[a b]
Quintile 5	67.74 (12.13)[a]	61.21 (13.43)[a]	61.22 (11.97)[a]

[a] Significantly (p < .05) different from quintile 1.

[b] Significantly (p < .05) different from quintile 5.

Pre-episode of care visits. Children with one or more pre-episode of care visits (vs. no pre-episode of care visits) had lower odds of a second episode of care in the all electronic data sample. One possible explanation is that these children received a higher dose of care (i.e., more sessions) and thereby had lower psychopathology and impairment (vs. those who did not have a pre-episode of care). A MANOVA was conducted in the chart review sample with internalizing problems at discharge, externalizing problems at discharge, and child impairment at discharge as dependent variables and one or more pre-episode of care visits as the independent variable. The results showed that psychopathology and impairment did not differ based on having pre-episode of care visits [Wilk's lambda F (3, 390) = 9.99 p = 0.52]. This indicates that higher dose of care and related psychopathology do not account for this finding.

Levels of care. Children who received a medium level of care (vs. low level of care) had higher odds and higher risk of re-accessing in the all electronic data sample; children who received a high/very high level of care (vs. low level of care) had lower odds and lower risk of re-accessing in the chart review sample. This raises the question of whether children who received a medium level of care were not receiving adequate services for their needs. One way to test this hypothesis is to examine whether children who received a medium level of care had comparable needs (i.e., psychopathology and impairment) to children who received a high/very high level of care. A multivariate analysis of variance MANOVA was conducted in the BCFPI sample with internalizing problems, externalizing problems, and child impairment as dependent variables and level of care as the independent variable. The results showed that psychopathology and impairment did *not* differ in children who received a medium level of care and high/very high level of care (see Table 3.24). A MANOVA was also conducted in the chart review sample with caregiver needs and strengths at intake, child strengths at intake, and child relationship strengths at intake as dependent variables and level of care as the independent variable. The results showed that caregiver needs and strengths, child strengths, and child relationship strengths did *not* differ in children who received a medium level of care and high/very high level of care (see Table 3.17). This suggests that despite equal levels of need, some children (i.e., medium level of care) received services that involved less restrictive environments, shorter expected duration, and fewer number of professionals. These services may not have been sufficient for some children, thereby resulting in a return for further treatment.

Table 3.17

Results of the Multivariate Analysis of Variance Post-Hoc Tests for Levels of Care, BCFPI, and CANS variables

		Levels of care		
		Low	Medium	High/Very high
BCFPI scales (T-scores)	Externalizing problems M (SD)	68.29 (12.81)	70.28 (12.91)[a]	71.09 (15.16)[a]
	Internalizing problems M (SD)	63.99 (13.86)	63.92 (14.15)	64.04 (15.92)
	Child impairment M (SD)	66.34 (13.70)	68.35 (14.31)[a]	69.01 (15.27)[a]
CANS subscales	Caregiver needs and strengths M (SD)	5.63 (2.97)	5.77 (3.15)	6.31 (3.64)
	Child strengths M (SD)	8.46 (4.51)	8.29 (4.26)	9.43 (5.07)
	Child relationship strengths M (SD)	9.98 (4.55)	10.16 (4.67)	10.97 (4.83)

Note: Wilk's lambda F (6, 3492) = 3.44, p <. 01 for the MANOVA in the BCFPI sample; Wilk's lambda F (9, 944.44) = 2.23, p <. 05 for the MANOVA in the chart review sample

[a] Significantly (p < .05) different from low level of care.

There was one inconsistent finding associated with this variable: children who received a medium level of care had a *lower risk of* a second episode of care in the chart review sample (i.e., the opposite direction than in the all electronic data sample). This raises the question of whether the analyses were influenced by the differences in coding of this variable. Specifically, high and very high levels of care categories were merged in the chart review sample. The multinomial logistic regression and cox regression in the all electronic data were re-run with high and very high levels of care merged (see Appendix H). The results show that coding does not account for the difference in the direction of the predictor.

Chapter 4: Discussion

Almost a third of children who had an episode of care (i.e., at least three visits) re-accessed services again within four years. Of families that re-engaged, two-thirds (20% of the sample) had a second episode of care, while a third (10% of the sample) had post-episode of care visits. The results are compared to the findings in the literature, followed by a discussion of the strengths and limitations of the study, future directions, and implications.

4.1 Rates and Patterns of Re-Accessing CAHM services

The present study found that 30% of children re-accessed CAMH services; 7% within 6 months and 32% within 9 months. This is comparable to research on residential and psychiatric units that has found re-admission rates between 19% and 38%, with over half of children re-accessing within 6 months (Blader, 2004; Fite et al., 2009; Fontanella, 2008; Lakin et al., 2008; Yampolskaya et al., 2013).

Further analyses showed that 10.4% of cases had one or two post-episode of care visits and 19.6% had a second episode of care. The latter is equivalent to the study on community-based services by Reid and colleagues (2015) that found that 19.2% of children had a second episode of care within a 5-year period.

Time to re-access may have been longer in the current study, compared to the re-admission literature, for two reasons. First, there are differences in the populations being studied; children receiving community-based services would be expected to have less severe problems and impairment than children receiving care in inpatient units. Second, the definition of episode of care in the current study (i.e., at least 3 visits with a period of 6 months without visits between episodes) meant that the earliest time possible to re-access was 6 months.

Noteworthy is the finding that the percentage of children having a second episode of care was higher than children who had post-episode of care visits. Further, time to re-access services was shorter for children who went on to have a full second episode of care, compared to children with just post-episode of care visits. This finding cannot be compared to the literature since prior research has grouped all children who re-accessed or were re-admitted together. Conceptual differences between these two re-accessing scenarios will be discussed later.

4.2 Predictors of Re-Accessing Services

Given the number of variables examined and extensive analyses conducted, the following sections focus only on the variables that consistently predicted re-accessing across samples and variables that predicted re-accessing that were specific to a sample.

4.2.1 Consistent Predictors Across Samples

Child age. With increasing age, children had lower odds and lower risk of a second episode of care in all samples. There has been a mixture of findings with regards to the relationship between age, access to services, and re-admission to inpatient units. Some studies have found that older age is associated with accessing services and re-admission (Fontanella, 2008; Sayal, 2006; Stewart et al., 2013), some have found younger age is associated with accessing services and re-admission (Arnold et al., 2003; Zwaanswijk et al., 2003), and others have found no relationship with accessing services or re-admission (Blader, 2004; Farmer et al., 1999; Fite et al., 2009; Lakin et al., 2008; Verhulst & Mundt, 1986; Zimmerman, 2005). The possibility that older children had aged out of care, tended to be referred to other services, or had less severe psychopathology was explored, but not supported by the data. A possible explanation is that as children get older they become more reluctant or unwilling to attend services. Parents may, therefore, have more difficulty bringing older children to sessions.

Levels of care. Children who received a medium level of care had higher odds and higher risk of re-accessing than children who received a low level of care in the all electronic data sample; children who received a high/very high level of care had lower odds and lower risk of re-accessing than children who received a low level of care in the chart review sample. This finding cannot be compared to the literature since prior research has not examined levels of care as a predictor. Supplementary analyses revealed that psychopathology, impairment, caregiver needs, and child strengths did not clearly differentiate medium and high/very high level of care groups. If these variables are taken as indicators of need, this suggests that despite equal levels of need, some children who received a medium level of care may have needed services that involved longer durations, and more professionals (e.g., case conferencing, multi professional teams). These medium level services may not have been sufficient for some children, thereby resulting in a return for further treatment.

In contrast, children who received a medium level of care had a lower risk of a second episode of care in the chart review sample; the opposite direction to the all electronic data sample. The supplementary analyses showed that the coding of the variable in the chart review sample (i.e., merging high and very high levels of care) had a slight influence on the statistical significance, but not the direction of the results. It is possible these differences in findings across samples are due to inherent differences in children from whom chart review data were available (versus not available; see Table 3.6).

4.2.2 Predictors Specific to a Sample

Family burden – BCFPI sample. Families with burden *T*-scores between 60 and 69 (i.e. borderline scores) had higher odds and higher risk of a second episode of care than families with sub-clinical ($T < 60$) levels of burden. This is in accordance with research that has found that parental burden is a predictor of accessing services and re-admission to inpatient units (Ford, Hamilton, Meltzer, & Goodman, 2008; Foster, 1999; Sayal, 2006; Zwaanswijk et al., 2003). It is important to note that while the higher categories of burden where not statistically significant, the ORs and HRs were also greater than 1.

Child welfare involvement – chart review sample. Families with child welfare involvement, compared to those with no involvement, had lower odds and lower risk of post-episode of care visits. This is contrary to the study hypothesis and research that has found an increase in mental health service use after initial contact with child welfare (Leslie et al., 2005) and that living in a group home is a predictor of re-admission (Stewart et al., 2013). There are a couple of possible explanations for this finding. First, families involved with child welfare may initially access mental health services because it is suggested or required, and not because they necessarily perceive a need. One episode of care may be perceived as sufficient, resulting in the end of child welfare's involvement with the family. There may be lower odds and lower risk of post-episode of care visits without a mandate for treatment by child welfare. Second, children in group homes might have higher levels of psychopathology which could contribute to the need to re-access care. Consequently, the level of child welfare involvement may be an important factor in predicting re-accessing services. Unfortunately, these analyses could not be conducted in the present study due to small cell sizes.

Child strengths – chart review sample. Increasing levels of child relationship strength at intake were related to a higher risk of a second episode of care. This is contrary to the study hypothesis; this is a novel finding in the literature as prior research has not examined this variable. It is possible that children with more strengths are less reluctant/ more willing to attend sessions. However, it is important to note that while the predictor was significant the HR was very close to 1, indicating a very small effect.

Disposition at discharge – chart review sample. Children who dropped out had a lower risk of a second episode of care. This is contrary to the study hypothesis; again, this is a novel finding in the literature. It is possible that the factors that contribute to drop-out (e.g., low lower perceived relevance of treatment; de Haan, Boon, de Jong, Hoeve, & Vermeiren, 2013) also influence recurrent service use. For example, if families are dissatisfied with the services provided by an agency because these do not seem relevant to the presenting problem, they are more likely to terminate treatment prematurely and to not seek further services within that agency.

4.2.3 Inconsistent and Non-Significant Predictors

All variables were not available for all clients. This resulted in three nested samples that varied in sample size and corresponding power, as well as the predictor variables. Inconsistencies in significant findings across samples may be due to differences in the probability to correctly reject the null hypothesis (i.e., power), differences in the variables included (e.g., controlling for psychopathology variables only in the BCFPI sample), underlying differences in the samples, or a combination of factors. Noteworthy is the relatively small chart review sample size. This necessitated collapsing categories for certain variables (i.e., SES profile of neighborhood, levels of care) and including only the significant univariate predictors in the multivariate models.

Internalizing problems, externalizing problems, impairment, caregiver needs and strengths, child relationship strengths, and care intensity and organization were not significant predictors of re-accessing care in any of the multivariate analyses. It is interesting that mental health problems and family/child needs, the very thing that treatment targets, do not drive recurrent service use. However, other studies have also failed to find a relationship between psychopathology and accessing services and re-admission to inpatient units (Arnold et al., 2003; Fite et al., 2009; Hintzpeter et al., 2015; Sayal, 2006; Zwaanswijk et al., 2003).

4.3 Study Strengths

To my knowledge, this is the first study to examine predictors of re-accessing services and predictors of time to re-access services in community-based CAMH agencies. Previous research has focused on re-admission to psychiatric hospitals and residential treatment centers. The present study helped address this gap in the literature.

Investigating demographic, service use, and psychopathology variables was another strength of the study. This allowed for a fairly comprehensive evaluation of factors that could influence re-accessing services. The inclusion of variables at discharge (e.g., CANS subscales, disposition at discharge) was particularly valuable given that few studies have examined its effects.

There are also a number of advantages to using administrative data and chart reviews, over interviews or self-reports. First, it does not require consent from every client or family. This circumvents the issue that individuals who participate may have different characteristics from those who decline. Second, sample sizes tend to be larger with increased power for statistical analyses. Third, it does not rely on parents' and/or children's recall of events, dates and symptoms, which may be inaccurate. Lastly, longitudinal administrative data avoids problems with differential attrition. Children in disadvantaged families (e.g., financial difficulties, unemployed parents, low socioeconomic status) are more likely to drop out from longitudinal studies (Althoff, Verhulst, Rettew, Hudziak, & Van Der Ende, 2010; Johnson et al., 2010; Wolke et al., 2009).

4.4 Study Limitations

There were some limitations associated with the variables that were available in the principal study. First, unknown parental marital status emerged as a predictor of a second episode of care and time to a second episode of care. However, it is unclear what group of children and family circumstances this category represents. Second, a proxy for families' SES was used, namely, the neighborhood SES. This is an area-based measure that is often discrepant with individual-based measures (Demissie, Hanley, Menzies, Joseph, & Ernst, 2000). Nevertheless, it has been argued that area-based measures are informative as they are associated with the availability of mental health services and sociocultural factors (Cummings, 2014). Third, several social support system and illness career variables were not available, including parental attitudes, the parent-child relationship, previous experiences with CAMH services, and the therapeutic alliance. These variables warrant attention, given that they have been found to play a role in access and re-admission (e.g., Blader, 2004; Fite, Stoppelbein, & Greening, 2009). Lastly, there was no information about children's presenting problems (i.e., specific problem for which families sought services) or the events that transpired after children were discharged from the first episode of care. These events may be important in understanding the factors that motivate families to seek further treatment.

There were two limitations regarding the CANS subscales. First, 36% of children had short involvement with agencies which precluded the completion of a CANS at discharge. CANS subscale score at discharge were, therefore, imputed (i.e., assumed not to change from baseline) for these children, as was done in the principal study. While not an ideal solution, the alternative would have been to exclude these children, which would have decreased the sample size and biased the sample. Second, the psychometric properties of the CANS subscales were not strong for typical standards for questionnaires. The confirmatory factor analysis (CFA) fit and internal consistency may be low/poor because of the way the CANS was structured and developed. Specifically, CANS items capture various areas of needs and strengths to create a comprehensive picture of the child. However, items within some subscales are not necessarily closely related. For example, the child relationship strengths subscale includes items like interpersonal skills and relationship permanence. While these items are conceptually related, children can have high interpersonal skills, but have low relationship permanence (i.e., variable contact with primary caregivers).

Considerations of survival analysis should be noted as well. First, some of the variables violated the proportional hazards assumption in some of the samples. However, it has been argued that HRs of variables that do not meet this assumption can still be interpreted and can be considered as the average effect over time (Allison, 2010). Furthermore, there were minimal changes in the HRs for the predictor variables when the violating variables were controlled for by stratification (see Appendix D). Second, research has demonstrated that families tend to seek help from various places. For example, Reid and colleagues (2011) examined the help-seeking patterns of families who contacted CAMH agencies in Ontario. The authors found that 97% of families had contacted the medical, educational, child welfare or justice sectors, in addition to a CAMH agency. Farmer and colleagues (2003) studied the sequence of service use across sectors using data from the Great Smoky Mountain Study. The authors found that of the children who first sought services from the specialty mental health sector, 62% went on to receive additional services from other sectors (i.e., education, general medicine and child welfare). Therefore, it is possible that some families re-accessed services elsewhere (e.g., medical sector) for which we do not have data available. This would violate the non-informative censoring assumption and bias the estimates.

Lastly, there are some constraints associated with the theoretical model utilized in the present study. The Revised Network-Episode model was chosen for its comprehensiveness and focus on children; however, several limitations have been identified (Dossett, 2017). First, the large number of variables makes it difficult to test the entire or even most of the model. Second, the model posits a dynamic interaction between the four factors (i.e., social content, social support system, illness career, and treatment system), but does not go into detail as to how these factors interact (e.g., order of interactions, how the interactions change as families go from help-seeking, to use of services, to re-access of services). Third, the model does not discuss how these variables are explanatory (i.e., how they explain service use). It is because of these reasons that the model was mainly utilized to identify potential predictors. It is important to acknowledge the difficulty in developing theoretical models to comprehensively capture and explain the multifaceted process of service use for children, without becoming too complex and esoteric.

4.5 Future directions

The current study found differences in rates, patterns, and predictors based on how children re-access care. This raises the question of whether there are also differences in the nature of post-episode of care and second episode of care visits. Specifically, it may be that post-episode of care visits are a form of booster sessions (i.e., reviewing previously learned skills to maintain treatment gains) whereas second episode of care visits are a new approach to care (e.g., new skills, different services or combination of services). Further research is needed to understand the differences in these visits.

As previously mentioned, the presenting problems and the events that transpired after children were discharged from services are unknown. A longitudinal study with repeated assessments during and after an episode of care, albeit challenging to conduct, would provide valuable information about the factors that drive recurrent service use.

Lastly, the mechanisms by which some of the predictors influence service use remains unclear. For example, younger children had higher odds and higher risk of a second episode of care, but the supplementary analyses did not elucidate the relationship. Future studies should examine the mechanisms for these and other variables. To this end, it would be beneficial to further expand theoretical models like the Revised-Network Episode Model. Namely, to propose how variables interact over time and how these explain service utilization. This would allow for more theory-driven hypotheses that could then be tested.

4.6 Conclusions and Implications

The current study contributes to the limited research on recurrent CAMH service use, particularly of community-based care. Results showed that a substantial number of children access services on more than one occasion. Social content, social support system, illness career, and treatment system variables were identified as predictors of re-accessing and time to re-access care; although there was some inconsistency in predictors across samples.

There are a number of implications arising from the current study. First, there is a high demand for CAMH services from both new and returning clients; agencies require financial and material support to meet this demand. Second, it underscores the need to provide information and discuss the process of re-engagement with clients (e.g. required paperwork, waitlists). Third, further research is required to understand this population of service users. As the literature on predictors and mechanisms of re-accessing continues to grow, it may provide agencies and clinicians with more clear guidance for changes in policies and service delivery.

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Appendix A: CANS Subscale Development

CANS subscales were developed to have psychopathology variables that were similar for the BCFPI and the chart review samples. The psychometric properties of the other CANS domains (i.e., child functioning, caregiver needs and strengths, care intensity and organization, and child strengths) were also examined. The subscales were first developed using data at intake from a previous study (study 1; Reid et al., 2011) and then validated in the data at intake from the principal study (study 2; Reid et al., 2010).

Previous Research

To my knowledge, there have been two studies that have examined the factor structure of CANS questionnaires. It is important to note that the items on the CANS varied across studies. This is because users are encouraged to adapt the measure to be more specific to their context (Lyons, 2009).

Stoner (2014) used an abbreviated version of the comprehensive CANS. The author analyzed data from 194 youth admitted to a private psychiatric hospital (mean age = 8.71, SD = 1.95). This version of the CANS included several items that were not in our version (e.g., fire setting, somatization, avoidance, dissociation, numbing). Moreover, it did not include some items that were in our version of the CANS (e.g., oppositional behavior, anti-social behavior, anxiety, attention-deficit/impulse control). Stoner (2014) conducted a series of exploratory factor analyses (EFA) and confirmatory factor analyses. Analyses were informed by Social Ecological Theory and psychometric theory. None of the proposed models demonstrated a good fit using maximum likelihood (i.e., maximize the likelihood of sampling the observed correlation matrix; Tabachnick & Fidell, 2001) or weighted least squares methods (i.e., utilize asymptotic variances of polychoric correlations to estimate a weight matrix; Flora & Curran, 2011) in the CFA. Given the differences in items, generalization of their results to our database was limited.

Alamdari and Kelber (2016) developed and tested a short version of the CANS for treatment planning and program evaluation. The authors analyzed data from 149 youth receiving outpatient services in a CAMH agency (mean age = 12.11, SD = 3.54). This version included several items that were not in our version (e.g., eating disturbance, family stress, child judgment, parenting skills). Furthermore, it did not include several items that were in our version (e.g., danger to self, danger to others, sleep functioning, temporal consistency, situational consistency, elopement). EFAs were conducted. The authors focused on a psychometric approach whereby only items that had strong loadings (>.45) were retained in the factor/subscale, regardless of an item's clinical utility. The authors arrived at four functioning subscales and two psychopathology subscales. The functioning subscales were labelled: family functioning, social functioning, caregiver functioning, and educational functioning. The psychopathology subscales were labelled: internalization and externalization. There was 75% agreement between the caregiver functioning subscale and our proposed caregiver strength and needs subscale, and 100% agreement between the two psychopathology subscales and our proposed internalizing and externalizing subscales in the items that were available in both versions of the CANS. Further comparison of the functioning subscales is limited due to differences in the items.

Samples and Procedures

Study 1. Study 1 examined patterns of service utilization within 6 CAMH agencies over a period of 5 years (Reid et al., 2011). Children were between the ages of 4 and 11 at the time of their first visit which occurred between the years of 2000 and 2002. Chart reviews were conducted for a stratified random sample (n = 319). Trained research assistants completed the

CANS at intake (i.e., first in-person visits) and end of involvement (i.e., end of involvement with agency or end of the study period). Information gathered and ratings completed included: (1) demographic information (e.g., date of birth, sex) , (2) Child and Adolescent Needs and Strengths scale (CANS; Lyons, 1999), and (3) disposition at discharge (e.g., referred, drop out, completed treatment). The intake data from this study was used to conduct the EFAs and develop the subscales.

Study 2. Study 2 examined predictors of patterns of service utilization within 5 CAMH agencies over a period of 4 years (Reid et al., 2010). Children were between the ages of 5 and 13 at the time of their first visit which occurred between the years of 2004 and 2006. Chart reviews were conducted for a stratified random sample (n = 625). Trained research assistants completed the CANS at start of involvement (i.e., first in-person visit), start and end of each episode of care, and end of involvement within the study time window (i.e., last in-person visit). Information gathered and ratings completed included: (1) demographic information (e.g., date of birth, sex) , (2) Child and Adolescent Needs and Strengths scale (CANS; Lyons, 1999), and (3) disposition at discharge (e.g., referred, drop out, completed treatment). The intake data from this study was used to validate the CANS subscales. Specifically, data from the start of involvement or first episode of care was used, whichever came first.

There are two differences between the CANS items in study 1 and study 2 due to scale developments over time. First, depression and anxiety are assessed in one item in the study 1, but separately in two items in the study 2. Second, caregivers' resources to support caring for the child (i.e., natural supports) is evaluated in one item in study 2, but not in study 1. See Table A1 for a list of the items in study 1 and study 2 organized by CANS domains.

Table A1

Items in the Original CANS Domains in Study 1 and Study 2

Domain	**Study 1 Item #**	**Study 2 Item #**	**Items**
Problem presentation	1	1	Psychosis
	2	2	Attention deficit/impulse control
	3	3,4	Depression/anxiety
	4	5	Oppositional behavior
	5	6	Emotional control
	6	7	Antisocial behavior
	7	8	Substance abuse
	8	9	Adjustment to trauma
	9	10	Attachment
	10	11	Anger control
	11	12	Situational consistency of problems
	12	13	Temporal consistency of problems
Risk behaviors	13	14	Danger to self
	14	15	Danger to others
	15	16	Runaway
	16	18	Sexually abusive behavior
	17	18	Social behavior
	18	19	Crime/delinquency
Functioning	19	20	Intellectual/developmental
	20	21	Physical/medical
	21	22	Sleep functioning
	22	23	Family functioning
	23	24	School achievement
	24	25	School behavior
	25	26	School attendance
	26	27	Sexual development
Care intensity and organization	27	28	Monitoring
	28	29	Treatment
	29	30	Transportation
	30	31	Service permanence
Caregiver strengths/ needs	31	32	Physical/behavioral health
	32	33	Supervision
	33	34	Involvement
	34	35	Knowledge
	35	36	Organization
	36	37	Resources
	37	39	Residential stability
	N/A	38	Natural Supports
	38	40	Safety

Child strengths	39	41	Family contact
	40	42	Interpersonal
	41	43	Relationship permanence
	42	44	Educational
	43	45	Vocational
	44	46	Well-being
	45	47	Optimism
	46	48	Spiritual/religious
	47	49	Talent/interest
	48	50	Inclusion

Exploratory Factor Analyses

First, EFAs for each of the CANS domains in study 1 were conducted. All analyses were conducted using normalized weights. Principal axis factoring (PAF) with a direct oblimin rotation was used. PAF was selected as it does not require the assumption of multivariate normality (Floyd & Widaman, 1995) and a direct oblimin rotation was used as we expected the factors to correlate. Psychosis, substance abuse, attachment, and vocational items had low variance and/or low endorsement in the sample and had to be removed from the analyses. To facilitate interpretation, each domain was run separately except for problem presentation and risk behaviors which were run together as they both represent psychopathology items. EFAs were run by specifying ± 1 factors that would be theoretically expected in each CANS domain. For example, the psychopathology domain was expected to have 2 factors (i.e., externalizing problems and internalizing problems); analyses were run using one, two, and three factor models. Family functioning, sleep functioning, situational consistency and temporal consistency items had low loadings (<.35) in the EFA. These items were moved to other domains based on low loadings and conceptual reasons: family functioning was moved from the functioning domain to the caregiver needs and strengths domain, sleep functioning was moved from the functioning domain to the psychopathology domain, and situational and temporal consistency were moved from the psychopathology domain to the functioning domain. The EFAs were re-run and the analyses supported the modifications.

The factor solutions chosen for each domain were based on the pattern of item loadings and simplicity of interpretation. Items were placed on a factor based on the strength of the loadings. The result was 7 subscales: (1) internalizing problems, (2) externalizing problems, (3) child impairment, (4) care intensity and organization, (5) caregiver needs and strengths, (6) child strengths, and (7), child relationship strengths. Table A2 outlines the items factor loadings in each proposed subscale.

Table A2

Items and Factor Loadings in Proposed CANS Subscales

Domain	Items	EFA loadings
Psychopathology items 2 factor solution		
Internalizing problems	Depression/anxiety	.82
	Danger to self	.33
	Sleep functioning	.33
	Adjustment to trauma	.20
Externalizing problems	Anger control	.87
	Danger to others	.85
	Emotional control	.73
	Oppositional behavior	.73
	Antisocial behavior	.61
	Attention deficit/impulse control	.57
	Social behavior	.45
	Crime/delinquency	.40
	Runaway	.33
	Sexually abusive behavior	.21
Functioning items 1 factor solution		
Child impairment	School achievement	.74
	Intellectual/developmental	.57
	Situational consistency of problems	.53
	School behavior	.42
	Temporal consistency of problems	.39
	Sexual development	.28
	Physical/medical	.19
	School attendance	.16
Care intensity and organization items 1 factor solution		
Care intensity and organization	Treatment	.80
	Monitoring	.41
	Transportation	.29
	Service permanence	.21
Caregiver needs and strengths items 1 factor solution		
Caregiver strengths/ needs	Supervision	.73
	Resources	.55
	Organization	.41
	Physical/behavioral health	.40
	Family functioning	.31
	Residential stability	.31
	Knowledge	.29
	Safety	.27

	Involvement	.21
	Natural Supports	N/A
Child strengths 2 factor solution		
Child relationship strengths	Family contact	.60
	Educational	.50
	Interpersonal	.45
	Relationship permanence	.38
Child strengths	Inclusion	.72
	Talent/interest	.67
	Well-being	.67
	Optimism	.53
	Spiritual/religious	.43

Note: EFA = exploratory factor analyses. EFAs were conducted using intake data in study 1.

Confirmatory Factor Analyses

Second, confirmatory factor analyses using data from study 2 were conducted. Specifically, the complete models (i.e., 1-factor solution, the 6-factor original model, and the 7-factor proposed model) and each subscale/domain model (e.g., care intensity and organization, child strengths) were examined. Direct weighting of data could not be conducted within the EQS program. Thus, weighted bivariate correlations amongst the items were computed and CFAs were run using the correlation matrix. Because a correlation matrix was used to impute the data, the robust method could not be run. A maximum likelihood estimation and oblique factors were specified. Maximum likelihood was chosen as this is the traditional method of estimation. An asymptotically distribution-free method, which does not require multivariate normality, was considered. However, it was not used as it requires very large sample sizes to obtain good estimates (Curran, West, & Finch, 1996; Tabachnick & Fidell, 2001). Oblique factors were specified because factors were expected to correlate. Absolute fit was assessed by examining the root means square error of approximation (RMSEA) where values less than or equal to 0.08 are considered acceptable (Hu & Bentler, 1998). Relative fit was assessed by examining the comparative fit index where values higher than 0.9 are considered acceptable (Marsh, Balla, & McDonals, 1988). Chi square was not relied on as it tends to be significant with large sample sizes (Gatignon, 2014). Table A3 to A5 provides a summary of the fit indices. The fit indices were poor for all models, except for the care intensity and organization domain and subscale. It is important to note that the proposed 7-factor model was somewhat superior to the original 6-factor model, and 1-factor model.

Table A3

Summary of Fit Indices for Confirmatory Factor Analyses for Complete Models

Model	Chi Square	RMSEA	CFI
1-factor model	5979.16*	0.091	0.39
6-factor original model	5550.38*	0.088	0.46
7-factor proposed model	4748.88*	0.083	0.51

Note: Analyses were conducted using intake data (i.e., start of involvement or first episode of care) from study 2.
* $p < .001$

Table A4

Summary of Fit Indices for Confirmatory Factor Analyses for CANS Subscales

Model	Chi Square	RMSEA	CFI
Psychopathology			
2 factors: Externalizing problems and internalizing problems subscales	764.68*	0.112	0.76
Impairment			
1 factor: Child impairment subscale	103.87*	0.088	0.45
Care intensity and organization			
1 factor: Care intensity and organization subscale	4.23	0.043	0.97
Caregiver			
1 factor: Caregiver needs/strengths subscale	164.01*	0.078	0.75
Strengths			
2 factors: Child strengths and child relationship strengths subscale	172.36*	0.097	0.65

Note: Analyses were conducted using intake data (i.e., start of involvement or first episode of care) from study 2.
* $p < .001$

Table A5

Summary of Fit Indices for Confirmatory Factor Analyses for Original CANS Domains

Model	Chi Square	RMSEA	CFI
Problem presentation domain	411.35*	0.134	0.77
Risk behaviors domain	51.61*	0.089	0.88
Functioning domain	60.41*	0.058	0.83
Care intensity and organization domain	4.23	0.043	0.97
Caregiver needs and strengths domain	124.39*	0.077	0.74
Child strengths domain	200.05*	0.103	0.58

Note: Analyses were conducted using intake data (i.e., start of involvement or first episode of care) from study 2.

* $p < .001$

Third, the internal consistency of the subscales were computed. Table A6 provides a summary of the internal consistency estimates. Cronbach's alpha ranged from 0.37 to 0.83 in study 2.

Table A6

Internal Consistency of the Proposed Subscales in the Study 2

Subscale	Number of items	Cronbach's alpha
Internalizing problems	5	0.59
Externalizing problems	10	0.83
Child functioning	8	0.55
Caregiver needs and strengths	10	0.61
Child relationship strengths	4	0.37
Child strengths	5	0.50
Care intensity and organization	4	0.36

Note: Analyses were conducted using intake data (i.e., start of involvement or first episode of care) from study 2.
* p < .001

The last step was to examine the divergent and convergent validity with the BCFPI based on study 2 data (see Table A7). The internalizing problems, externalizing problems, and child functioning CANS subscales were moderately to moderately-highly and significantly correlated with their BCFPI counterparts. Moreover, the correlation with the counterparts was stronger than with the other BCFPI scales. The caregiver needs and strengths, child strengths, and child relationship strengths CANS subscales do not have a counterpart in the BCFPI. However, these subscales were correlated with some of the problem presentation and functioning BCFPI scales as would be expected. Overall there is preliminary support for the divergent and convergent validity of the proposed CANS subscales.

Table A7

Correlations with Relevant BCFPI Scales in Study 2

	BCFPI: Internalizing problems	BCFPI: Externalizing problems	BCFPI: Child global functioning	BCFPI: Global family situation
CANS: Internalizing problems	**.57****	.16**	.39**	.29**
CANS: Externalizing problems	.14**	**.59****	.41**	.52**
CANS: Child functioning	.13**	.34**	**.49****	.35**
CANS: Caregiver needs and strengths	.10*	.17**	.11*	.20**
CANS: Child strengths	.30**	.16**	.24**	.24**
CANS: Child relationship strengths	.07	.35**	.38**	.24**
CANS: Care intensity and organization	.12*	.37**	.30**	.36**

Note: Analyses were conducted using intake data (i.e., start of involvement or first episode of care) from study 2. Sample size varied slightly depending on the data available for each variable; n = 374 to 414. Correlations in bold reflect conceptually-based convergent correlations.
*p<.05 **p<.01

Current Study

The psychometric properties of the CANS subscale were also examined in the current study sample. Specifically, the internal consistency and correlations with the BCFPI were computed (see Tables A8 and A9). The following analyses used data from the start of the first episode of care.

Table A8

Internal Consistency of the Proposed Subscales in the Current Study

Subscale	Number of items	Cronbach’s alpha
Internalizing problems	5	0.59
Externalizing problems	10	0.84
Child functioning	8	0.59
Caregiver needs and strengths	10	0.63
Child relationship strengths	4	0.36
Child strengths	5	0.39
Care intensity and organization	4	0.41

Note: Analyses were conducted using data from the start of the first episode of care from the current study.

Table A9

Correlations with Relevant BCFPI Scales in the Current Study

	BCFPI: Internalizing problems	BCFPI: Externalizing problems	BCFPI: Child global functioning	BCFPI: Global family situation
CANS: Internalizing problems	**.57****	.14*	.34**	.24**
CANS: Externalizing problems	.13*	**.58****	.42**	.54**
CANS: Child impairment	0.11	.37**	**.51****	.40**
CANS: Caregiver needs and strengths	0.09	0.11	0.003	.16*
CANS: Child strengths	.21**	.18**	.19**	.21**
CANS: Child relationship strengths	0.04	.33**	.38**	.30**
CANS: Care intensity and organization	0.11	.35**	.31**	.39**

Note: Analyses were conducted using data from the start of the first episode of care from the current study. Sample size varied slightly depending on the data available for each variable; n = 268 to 295. Correlations in bold reflect conceptually-based convergent correlations.
*p<.05 **p<.01

Appendix A References

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Appendix B: Predictors of Re-Accessing Services and Time to Re-Access Services Organized by Revised Network-Episode Categories

Table B1

Predictors of Re-Accessing Services and Time to Re-Access Services Organized by Revised Network-Episode Categories

Revised Network-Episode Model Variables	Study measures
Social content	
Child social and geographic location	
Gender	Male/female
Age	Age at beginning of first episode of care
Child personal health background	
Prior history of illness	History of abuse or neglect
Child illness characteristics	
Severity	Externalizing problems (BCFPI and CANS) Internalizing problems (BCFPI and CANS)
Functional impairment	Child impairment (BCFPI and CANS) Child strengths (CANS) Child relationship strengths (CANS)
Family social and geographic location	
Parental marital status	Two-parent household, single-parent household, unknown
Parental income	SES profile of neighborhood quintiles
Family health background	
Family psychiatric history/parental coping style	Caregiver strength and needs (CANS)
Organizational constraints	
Organization of care	Care intensity and organization (CANS)
Social support system	
Community network structure, content, and functions	
Professionals and paraprofessionals	Child welfare involvement
Illness career	
Recognition	
Family burden	Family burden (BCFPI)
Key exits	
Termination of care	Disposition at discharge

Key timing and sequencing	
Delay and spacing of consults	Spacing of visits (SD) in first episode of care
Treatment system	
Network structure	
Duration	Number of visits in first episode of care One or more pre-episode of care visits
Network content	
Modalities	Levels of care

Appendix C: Levels of Care Classification

Various levels of care classifications have been proposed in the scientific literature (Bickman, 1996; Burns et al., 1993; Grimes, Kapunan, & Mullin, 2006; Oswald, Cohen, Best, Jenson, & Lyons, 2001; Rizzo et al., 2007; ten Have, Nuyen, Beekman, & de Graaf, 2013) and policy frameworks (e.g., MCYS, 2006).

The classification systems that have been proposed are often limited in one of two ways: they (1) utilize broad categories (e.g., Rizzo et al., 2007; see Table C1) that fail to capture the nuisances in the services provided by CAMH agencies (e.g., play-art therapy, school-based interventions, wraparound), or (2) utilize categories that involve medication information and/or information of visits in the primary health care system (e.g., ten Have et al., 2013; see Table C2) that are difficult to apply to other studies, including the current study.

Table C1

Level of Care Classification Utilized by Rizzo and Colleagues

Level	Description
1	Out-patient: group therapy, family therapy, or individual therapy
2	Short-term: inpatient hospitalization or partial hospitalization
3	Long-term: residential placement or therapeutic school

Table C2

Level of Care Classification Utilized by Ten Have and Colleagues

Level	Description
1	Two (or more) visits with any professional
2	Four (or more) visits with any professional *or* Half a month (or more) of any medication and two visits (or more) to a physician or mental health professional
3	Eight (or more) visits with any professional *or* One month (or more) of any medication and four (or more) visits to a physician or mental health professional
4	Eight (or more) visits with any professional lasting at least 30 minutes *or* One month (or more) of medication specific for the presenting problem and four (or more) visits to a physician or mental health professional

Consequently, a level of care classification system was developed to be better capture the services provided in CAMH agencies in the study. The development was informed by existing classification systems and informal consultation with staff at a local CAMH agency. First, staff at each CAMH agency reviewed their agencies' services and categorized each type of service in the MYCS framework (MCYS, 2006). Second, the MCYS categories were grouped into 4 levels of care: 1 = low; 2 = medium; 3 = high; 4 = very high (see Table C3). The levels vary based on the restrictiveness of the treatment, the expected duration of treatment, and the expected number of professionals involved. Higher levels represent more restrictive settings with longer expected duration of treatment and more professionals involved. Third, the percentage of visits in each level was calculated for each child. The level with the highest percentage of visits represented the level of care received. If two or more levels had equal percentages, the highest level was chosen.

Table C3

Level of Care Classification for CAMH Service

Low	Medium	High	Very high
Drop-in resource center	School based educational intervention	Diagnosis assessment	Inpatient services
Intake assessment	Evidence based interventions	Assessment other	Residential treatment
Brief therapy	Family counselling	Professional assessment consultation	Intensive home-based interventions
Group therapy	Individual counselling	Specialized assessment	Treatment foster care
	Intervention - other	Trauma crisis stabilization	Wraparound
Parent training	Outpatient services	Crisis counselling	Mobile crisis services
Outreach services	Play-art therapy	Crisis intervention	
	Targeted intervention	Multi professional teams	
	Medication monitoring	Case conferencing	
		Case management	
		Day treatment	
		In home respite services	
		Out of home respite services	
		Crisis residential – emergency shelters	

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Appendix D: Stratified Cox Regressions

Table D1

Cox Regression Predicting Second Episode of Care in All Electronic Data Sample Controlling for SES Profile of Neighborhood by Stratification

	Stratified	Not stratified
	Second episode of care [a] (n = 666)	Second episode of care [a] (n = 666)
	Adjusted HR	Adjusted HR
Social content		
Child sex [b]	0.59 (0.32 – 1.08)	0.61 (0.33 – 1.12)
Child age (years)	0.93 (0.89 – 0.97)**	0.93 (0.90 – 0.97)**
Child and sex interaction	1.06 (0.99 – 1.12)	1.05 (0.99 – 1.12)
Illness Career		
Parental marital status [c]		
Single – parent household	1.00 (0.83 – 1.21)	1.01 (0.84 – 1.23)
Unknown	1.85 (1.52 – 2.25)**	1.90 (1.56 – 2.32)**
Spacing of visits during first episode of care (SD)[d]	0.99 (0.99 – 1.00)	0.99 (0.99 – 1.00)
Treatment System		
One or more pre-episode of care visits [e]	0.81 (0.57 – 1.16)	0.82 (0.58 – 1.17)
Number of visits in first episode of care [f]	1.00 (0.99 – 1.01)	1.00 (0.99 – 1.01)

* p<.05 ** p<.01

[a] Cases censored (n = 2380).

[b] Reference category is males.

[c] Reference category is two-parent family.

[d] Spacing of visits by 1 SD increase.

[e] Reference category is no pre-episode of care visits.

[f] Number of visits by 1 visit increase.

Table D2

Cox Regression Predicting Second Episode of Care in All Electronic Data Sample Controlling for Levels of Care by Stratification

	Stratified	Not stratified
	Second episode of care [a] (n = 666)	Second episode of care [a] (n = 666)
	Adjusted HR	Adjusted HR
Social content		
Child sex [b]	0.62 (0.34 – 1.15)	0.61 (0.33 – 1.12)
Child age (years)	0.93 (0.90 – 0.97)**	0.93 (0.90 – 0.97)**
Child and sex interaction	1.05 (0.99 – 1.11)	1.05 (0.99 – 1.12)
Illness Career		
Parental marital status [c]		
Single – parent household	1.07 (0.89 – 1.29)	1.01 (0.84 – 1.23)
Unknown	2.07 (1.71 – 2.51)**	1.90 (1.56 – 2.32)**
Spacing of visits during first episode of care (SD) [d]	0.99 (0.99 – 1.00)	0.99 (0.99 – 1.00)
Treatment System		
One or more pre-episode of care visits [e]	0.81 (0.79 – 1.15)	0.82 (0.58 – 1.17)
Number of visits in first episode of care [f]	1.00 (0.99 – 1.01)	1.00 (0.99 – 1.01)

* p<.05 ** p<.01

[a] Cases censored (n = 2380).

[b] Reference category is males.

[c] Reference category is two-parent family.

[d] Spacing of visits by 1 SD increase.

[e] Reference category is no pre-episode of care visits.

[f] Number of visits by 1 visit increase.

Appendix E: Fit Statistics for Multinomial Regressions

Table E1

Fit Statistics for Each Step of the Multinomial Regression for All Electronic Data

Step	Likelihood Ratio Test (df)	**Δ** Likelihood Ratio Test (df)	Goodness of fit (df)	**Δ** Goodness of fit (df)
Step 1: Social content	88.12 (18)**		543.06 (608)	
Step 2: Illness career	91.23 (20)**	3.11 (2)	5707.22 (5730)	5164.16 (5122)
Step 3: Treatment system	116.47 (30)**	25.24 (10)*	6780.42 (6724)	1073.20 (994)*

* $p < .05$ ** $p < .01$

Table E2

Fit Statistics for Each Step of the Multinomial Regression for the BCFPI Sample

Step	Likelihood Ratio Test (df)	**Δ** Likelihood Ratio Test (df)	Goodness of fit (df)	**Δ** Goodness of fit (df)
Step 1: Social content	80.66 (36)**		3116.62 (3032)	
Step 2: Illness career	98.60 (44)**	17.94 (8)*	3532.94 (3452)	416.32 (420)
Step 3: Treatment system	113.33 (54)**	14.73 (10)	3520.57 (3444)	12.37 (8)

* $p < .05$ ** $p < .01$

Table E3

Fit Statistics for Each Step of the Multinomial Regression for the Chart Review Sample

Step	Likelihood Ratio Test (df)	**Δ** Likelihood Ratio Test (df)	Goodness of fit (df)	**Δ** Goodness of fit (df)
Step 1: Social content	29.70 (10)**		595.65 (600)	
Step 2: Social support system	39.62 (12)**	9.92 (2)**	693.86 (724)	98.21 (124)
Step 3: Treatment system	48.69 (16)**	9.07 (4)	789.65 (846)	95.79 (122)

* $p< .05$ ** $p<.01$

Appendix F: Survival Curves in the BCFPI and Chart Review Samples

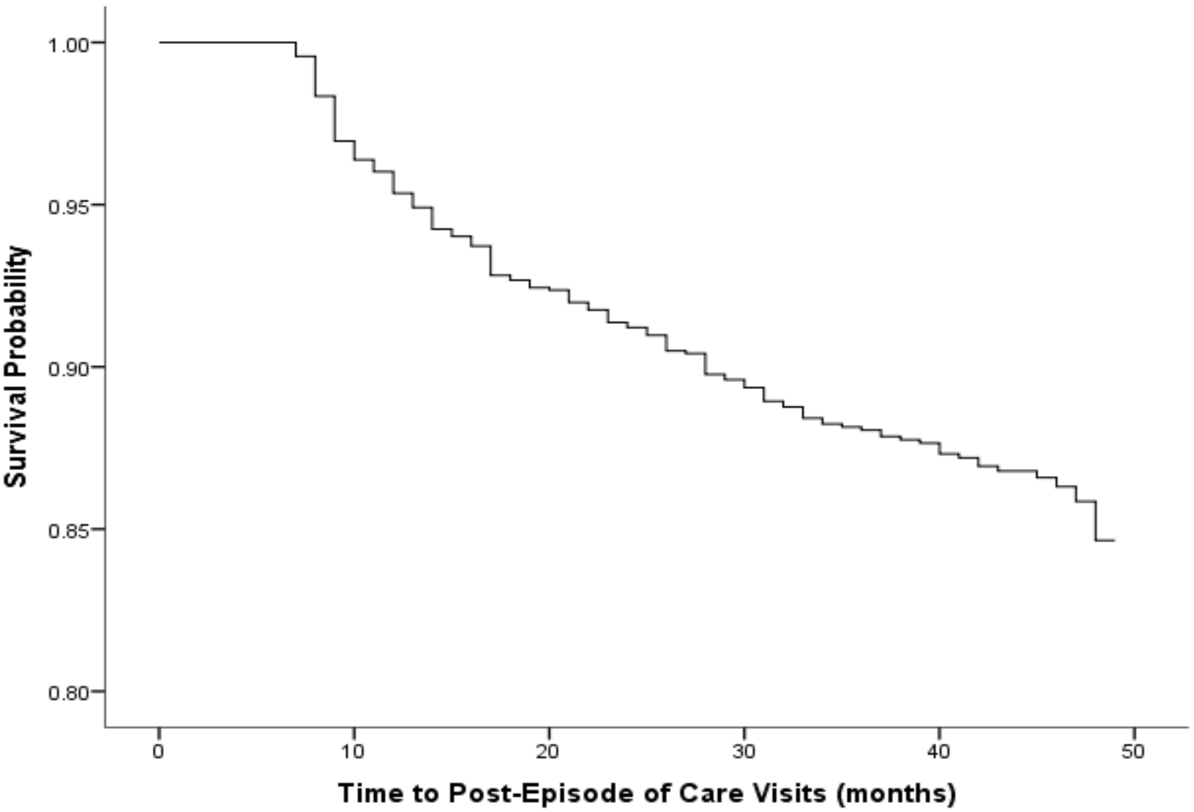

Figure F1. Survival curve showing the probability of not having a post-episode of care visits as a function of time in months for all the BCFPI sample. Time to post-episode of care visits ranged from 6 to 47 months (M= 18.19, median = 15.5, SD = 10.64). Half of the sample re-accessed care by 15 months.

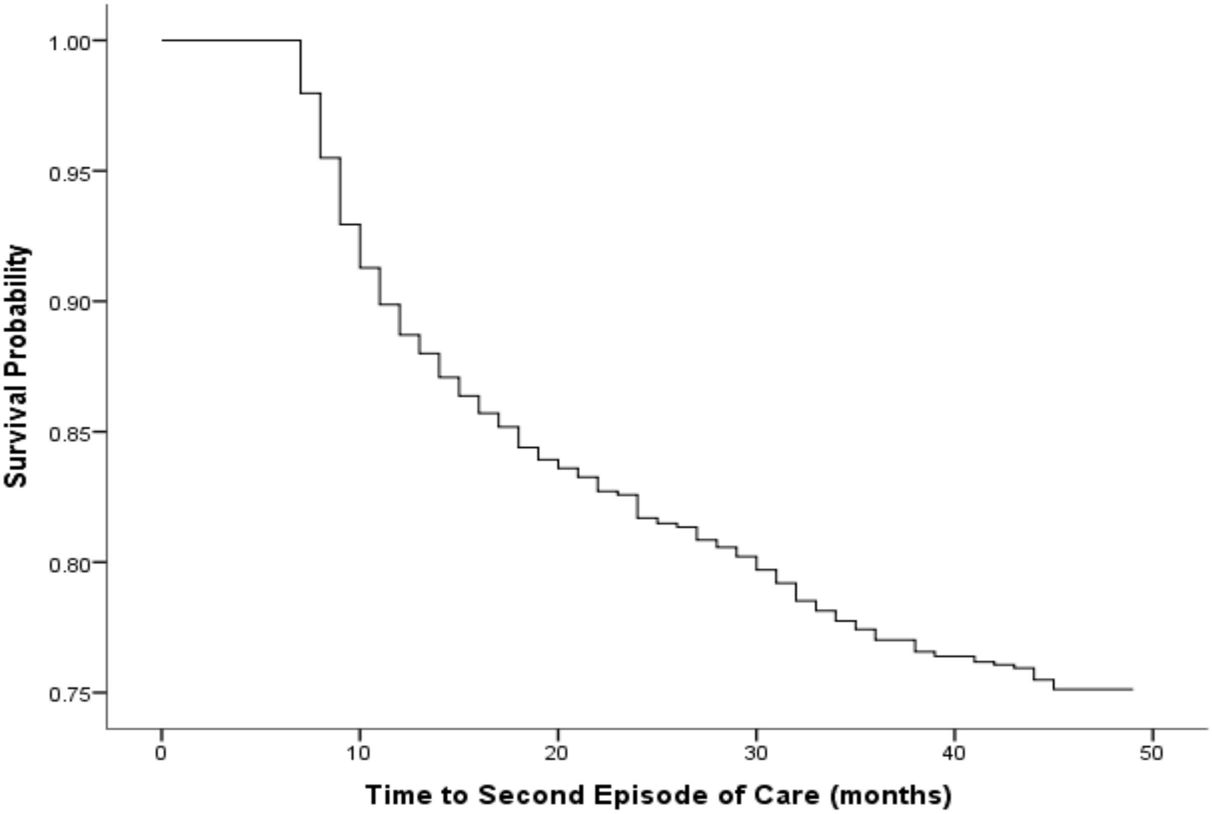

Figure F2. Survival curve showing the probability of not having a second episode of care as a function of time in months for the BCFPI sample. Time to second episode of care ranged from 6 to 44 months (M = 15.86, median = 12.00, SD = 9.77). Half of the sample re-accessed care by 12 months.

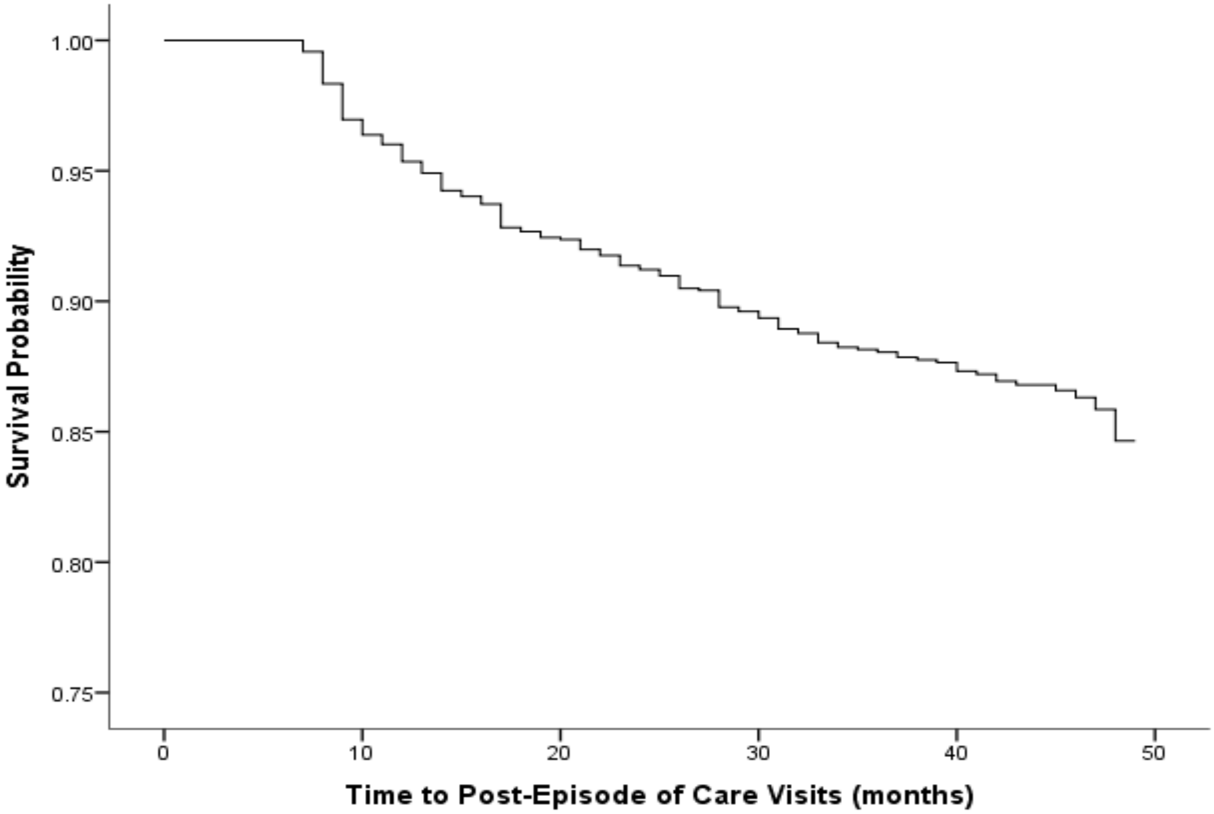

Figure F3. Survival curve showing the probability of not having a post-episode of care visits as a function of time in months for all the chart review sample. Time to post-episode of care visits ranged from 6 to 39 months (M= 17.10, median = 12.00, SD = 10.72). Half of the sample re-accessed care by 11 months.

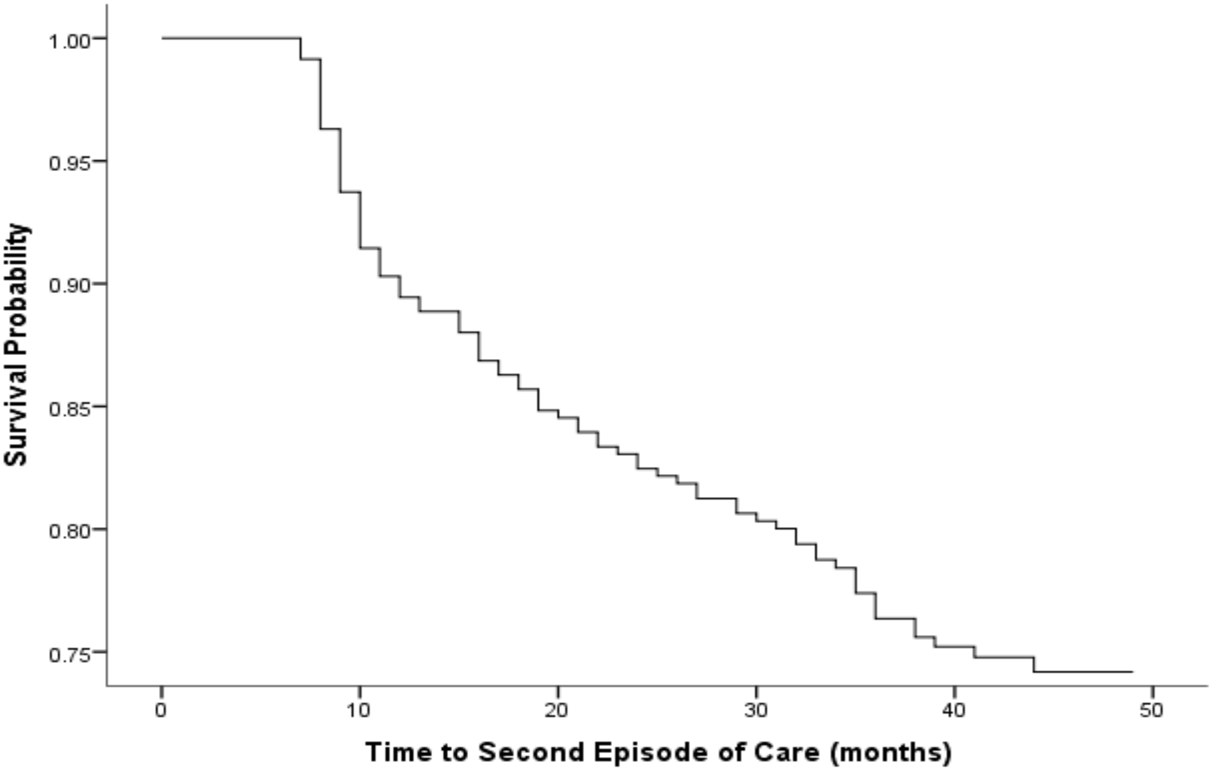

Figure F4. Survival curve showing the probability of not having a second episode of care as a function of time in months for the chart review sample. Time to second episode of care ranged from 6 to 43 months (M = 17.61, median = 15.00, SD = 10.54). Half of the sample re-accessed care by 14 months.

Appendix G: Fit Statistics for Cox Regressions

Table G1

Fit Statistics for Each Step of the Cox Regression in All Electronic Data Sample

	Post-episode of care visits model chi square (df)	Δ model chi square (df)	Second episode of care visits model chi square (df)	Δ model chi square (df)
Step 1: Social content	2.36 (9)		96.15 (9)**	
Step 2: Illness career	4.41 (10)	2.05 (1)	96.58 (10)**	0.43 (1)
Step 3: Treatment system	12.77 (15)	8.36 (5)	106.32 (15)**	9.74 (5)

* p<.05 ** p<.01

Table G2

Fit Statistics for Each Step of the Cox Regression in the BCPFI sample

	Post-episode of care visits model chi square (df)	Δ model chi square (df)	Second episode of care visits model chi square (df)	Δ model chi square (df)
Step 1: Social content	27.95 (18)		59.00 (18)**	
Step 2: Illness career	32.78 (22)	4.83 (4)	68.93 (22)**	9.93 (4)*
Step 3: Treatment system	36.44 (27)	3.66 (5)	73.53 (27)**	4.6 (5)

* p<.05 ** p<.01

Table G3

Fit Statistics for Each Step of the Cox Regression in the Chart Review sample

	Post-episode of care visits model chi square (df)	Δ model chi square (df)	Second episode of care visits model chi square (df)	Δ model chi square (df)
Step 1: Social content	7.65 (1)**		51.17 (8)**	
Step 2: Social support system	15.93 (2)**	8.28 (1)**	-	-
Step 3: Illness career	-	-	54.60 (9)**	3.43 (1)
Step 4: Treatment system	25.73 (4)**	9.80 (2)*	65.52 (11)**	10.92 (2)**

* $p<.05$ ** $p<.01$

Appendix H: Multinomial Logistic Regressions and Cox Regressions with Revised Coding

Table H1

Multinomial Logistic and Cox Regressions Predicting Post-Episode of Care Visits and Second Episode of Care in the All Electronic Data Sample

	Post-episode of care visits (n = 353)		Second episode of care (n = 666)	
	Adjusted OR	Adjusted HR	Adjusted OR	Adjusted HR
Levels of care – Revised coding [a]				
Medium	1.32 (1.00 – 1.73)	1.30 (1.01 – 1.68)*	1.27 (1.03 – 1.58)**	1.22 (1.01 – 1.47)*
High/Very high	1.08 (0.80 – 1.45)	1.05 (0.79 – 1.38)	0.98 (0.77 – 1.24)	0.94 (0.77 – 1.16)
Levels of care – Original Coding [a]				
Medium	1.32 (1.01 – 1.74)*	1.31 (1.01 – 1.68)*	1.27 (1.02 – 1.58)*	1.22 (1.01 – 1.46)*
High	0.98 (0.64 – 1.51)	0.95 (0.64 – 1.42)	1.04 (0.75 – 1.43)	0.99 (0.75 – 1.32)
Very high	1.14 (0.81 – 1.60)	1.11 (0.80 – 1.53)	0.93 (0.70 – 1.24)	0.90 (0.70 – 1.17)

* $p < .05$ ** $p < .05$

[a] Reference category is low level of care.

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Curriculum Vitae

Education

September 2015 - Present	Master of Science, Clinical Psychology Western University, London, ON Supervisor: Dr. Graham J. Reid
September 2011 - May 2015	Bachelor of Science, Honours Psychology (summa cum laude) University of Ottawa, Ottawa, ON Supervisor: Dr. Darcy A. Santor

Achievements & Awards

2016 - 2017	Graduate Research Fellowship, Children's Health Research Institute
2016 - 2017	Ontario Graduate Scholarship, Faculty of Social Sciences, Western University
2015 - 2017	Western Graduate Research Scholarship, Faculty of Social Sciences, Western University
2015	University of Ottawa Silver Medal, Faculty of Social Sciences, University of Ottawa
2013 - 2014	Dean's Honor List Scholarship, Faculty of Social Sciences, University of Ottawa
2013	Lillian Gertsman Scholarship, Faculty of Social Sciences, University of Ottawa
2011 - 2015	Dean's Honor List, Faculty of Social Sciences, University of Ottawa
2012 - 2015	Merit Scholarship, Faculty of Social Sciences, University of Ottawa
2011	Education Bursary, Faculty of Social Sciences, University of Ottawa
2011 - 2015	Admission Scholarship, Faculty of Social Sciences, University of Ottawa
2011	Governor General's Academic Medal – Bronze, Immaculata High School

Related Work Experience

January - April 2016	Instructor, Clinical Psychology (Psychology 3301) Western University
May - August 2016	Instructor, Clinical Psychology (Psychology 3301) Western University
January - April 2016	Teaching Assistant, Abnormal Psychology (Psychology 2310) Western University
September - December 2015	Teaching Assistant, Abnormal Child Psychology (Psychology 2320) Western University
June 2014 - March 2015	Research Volunteer, Laboratory of Personality and Social Psychology University of Ottawa
September 2013 - April 2015	Research Volunteer, Santor Laboratory University of Ottawa
June 2013 - June 2014	Research Assistant, Extreme Events Institute Florida International University

Publications

Sarmiento, C. & Lau, C. (in press). Diagnostic and statistical manual of mental disorders, 5th Ed.: DSM-5. In B. J. Carducci (Editor-in-Chief) & A. Di Fabio, D. H. Saklofske, & C. Stough (Vol. Eds.), *Wiley-Blackwell encyclopedia of personality and individual differences: Vol. III. Personality processes and individual differences*. Hoboken, NJ: John Wiley & Sons.

Posters

Sarmiento, C., & Reid, G.J., (2017, June). *Treatment outcomes of children's mental health services*. Poster presented at the 78th Annual Canadian Psychological Association Convention, Toronto, Ontario.

Sarmiento, C., & Reid, G.J., (2016, November). *Utilization of children's mental health services*. Poster presented at the 4th Annual Division of Child and Adolescent Psychiatry Research Half Day, London, Ontario.

Champaigne-Klassen, E., Bradley, K.L., Sarmiento, C., Oram, R., & Santor, D.A (2015, November). *Understanding the psychological threats of negative life events.* Poster presented at the 49th Annual Association for Behavioral and Cognitive Therapies Convention, Chicago, Illinois.

Borisevich, S., Miranda, D., Blais-Rochette, C., Osman, M., & Sarmiento, C. (2015, June). *Words versus action: Are lyrics consistent with a brand's social stand?* Poster presented at 76th Annual Canadian Psychological Association's Convention, Ottawa, Ontario.

Sarmiento, C., Bradley, K.L, Champagine-Klassen, E., Oram, R., & Santor, D.A. (2015, May). *Motives for negative thinking and worrying.* Poster presented at the 4th Annual Psychology Outside the Box Conference, Ottawa, Ontario.

Sarmiento, C., Lemay, J., & Santor, D.A. (2014, June*). Effect of age, gender and time of year on suicide rates: A population level analysis*. Poster presented at the 6th Annual Young Researcher's Conference, Ottawa, Ontario.

Presentations

Lau, C., & Sarmiento, C. (2017, April). *Strategies to stop procrastination*. Presentation, Merrymount Children's Centre, London, Ontario.

Lau, C., & Sarmiento, C. (2017, February). *Strategies to stop procrastination*. Presentation, Finding Your Way Lecture Series London Public Library, London, Ontario.

Lau, C., & Sarmiento, C. (2016, February). *Smartphone applications for mental health*. Presentation, Finding Your Way Lecture Series London Public Library, London, Ontario.

Scholarly and Professional Activities

September 2016 - Present	Reviewer, Western Undergraduate Psychology Journal Western University
August 2016 - Present	Executive, Psychology Graduate Student Association Western University
October 2015 - Present	Committee Member, Space and Facilities Committee Western University

September 2015 - August 2016	Steward, Graduate Teaching Assistants and Postdoctoral Associates Union Western University
September 2015 - Present	Ad-hoc Mentored Reviewer Journal of Pediatric Psychology Journal of the National Sleep Foundation Journal of Family Psychology Personality and Individual Differences