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Risk Behaviours and Service Use Intensity in Child Mental Health Care

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Abstract

Objective

Little is known regarding factors that predict Child and Adolescent Mental Health Services (CAMHS) use. The current study examined risk behaviours (e.g., danger to self, danger to others) among children with mental health issues as predictors of service use intensity (i.e., total visits) over 1 year, and across time (i.e., number of visits per two-month period).

Methods

Secondary data analyses of CAMHS chart review data spanning a 5-year period at 6 children's mental health agencies across Ontario from youth between the ages of 4 and 11 ($N = 356$) were conducted. Child risk behaviours were measured using the Child and Adolescent Needs and Strengths Scale – Mental Health (CANS-MH; Lyons, 1999) and examined as a predictor of service use intensity and patterns of service use intensity over a 1-year period.

Results

About one third (35.4%) of children presented with 1 or more risk behaviours. Of these, most (84.9%) presented with the risk behaviour "Danger to Others". Children who presented with Danger to Others had significantly higher service use than children who did not present with this risk behaviour ($X^2 = 6.93$, $p < .05$). Children who presented with only Danger to Others also had different temporal patterns of service use. For example, children with Danger to Others had higher service use intensity than children without this risk behaviour in only later months of the year.

Conclusions

Danger to Others appears to play an important role in predicting how intensely children and their families use mental health services. Children who present with this risk behaviour seem to need persistently more intense mental health services than children who do not.

Acknowledgements

Risk Behaviours and Service Use Intensity in Child Mental Health Care

There is a critical need for research on access and use of Child and Adolescent Mental Health Services (CAMHS) in Ontario considering that 1 in 5 children have a mental health problem, yet only 20 percent of these children receive specialized mental health services (Offord et al., 1989; Verhulst & Van der Ende, 1997). It is important to examine both the characteristics of children who use mental health services, and patterns of service use over time, in order to improve accessibility and delivery of child mental health services to the children and families that use them.

Children (i.e., age 4 to 18 years) who receive specialized mental heath services (e.g., psychological assessment and treatment) can access these through many different sectors including the educational system, juvenile justice system, and health services (e.g., family physicians) (Reid et al., 2011). Within specialized mental health services, information about the child and their presenting problems obtained at intake inform decisions regarding treatment options. The intensity of children's service use (i.e. the duration and/or degree of specialized mental health treatment that they receive) can therefore vary given that children who present with complex mental health problems at intake will likely require more treatment than children who present with less complex mental health problems. Service use intensity has been defined in the literature in two different ways. First, it has been defined as levels of care (He, Lyons, & Heinemann, 2004; Hodges, Doucette-Gates, & Kim, 2000; Oswald et al, 2001), which are often equated to the restrictiveness of the care setting. Care settings that do not restrict the child's daily life to a large degree (e.g., weekly mental health centre visits) are deemed to be low in intensity. In contrast, care settings that restrict the child from living as they did before their involvement in CAMHS (e.g., psychiatric hospitalization and inpatient care) are deemed to be high in intensity. Various other care options fall between these two extremes (e.g., day treatment and in-home

crisis stabilization; Hodges, Doucette-Gates, & Kim, 2000; Heflinger, 1996). Second, service use

intensity has simply been defined as the number of treatment visits (Burnett-Ziegler & Lyons,

2012; Costello et al., 1997; Hodges, Doucette-Gates, & Kim, 2000; Behar et al., 1996).

Conceptualizations of service use intensity should be taken into consideration when

examining clinical intake decisions, which assess a child's mental health needs before treatment

is initiated. Different conceptualizations of service use intensity may lead to different treatment

decisions. This is important because many children use mental health service for extended

periods of time, and previous research (Burns, Thompson, & Goldman, 1993; Emslie, Kennard,

& Mayes, 2011) suggests that making appropriate initial treatment decisions might have long-

term effects on the efficiency of mental health service use. Burns, Thompson. & Goldman (1993)

examined initial treatment decisions during a time in which policy changes advocated the use of

less intensive (i.e., outpatient instead of inpatient) services for children with mental health

problems in Virginia. Their research raised concerns that, due to this policy change, children did

not receive services that were intense enough to meet their needs. Instead, initial treatment

decisions placed some children in outpatient treatment settings as opposed to more intensive

services, thereby jeopardizing their chances of improvement. Emslie, Kennard, and Mayes (2011)

suggest that initial treatment decisions can affect response to early treatment, which significantly

predicts remission rates in youth with depression.

Service use intensity is a key variable to consider when investigating patterns and

tendencies within CAMHS. Two seminal studies (Behar et al., 1996; Costello et al., 1997)

examined how children and families use CAMHS. First, the Fort Bragg Child and Adolescent

Mental Health Demonstration (Behar et al., 1996) examined the effectiveness of a community-

based mental health system, which included a variety of treatment options in community and

home settings (Mordock, 1997). This directly contrasts with a traditional psychiatric treatment

system, consisting of inpatient and outpatient care in a hospital setting (Mordock, 1997). Service

use intensity in this study was conceptualized as the number of visits to any of the mental health

service options. The other seminal study was the Great Smoky Mountains Study of Youth

(Costello et al., 1997). This study took place in the Southern Appalachian mountain region of

North Carolina. Four waves of data were collected in the Great Smoky Mountains study:

baseline, and 1, 2, and 3-year follow-up assessments. At each wave, information about

symptoms, diagnoses, child functioning, risk behaviours, and services used (e.g., service use

onset and duration, service providers, financial costs of service use) were collected (Costello et

al., 1997). Service use intensity in this study was also conceptualized as the number of visits, but

only at specialty mental health centres.

Subsequent analyses of data from these two seminal studies sought to answer a number of

questions regarding child mental health service use intensity. For example, does service use

intensity contribute to treatment outcomes? In the Great Smoky Mountains data, it was found that

service use intensity resulted in better treatment outcomes (Hoagwood, 2000); however, analyses

of the Fort Bragg Demonstration data found different results depending on the data analytic

approach. Bickman et al. (2002) did not find that service use intensity and treatment outcome

were related, while Foster (2003), using propensity score matching techniques, did. Given

findings from these studies, service use intensity might be an important indicator of treatment

outcome; however, it is unclear what factors may contribute to service use intensity.

Risk Behaviours as Predictors of Service Use Intensity

When children enter any mental health agency, information is obtained regarding the

child and their presenting problems. Included in this intake data is information about symptoms,

impairments in the ability to function in daily life, and child risk behaviours. Risk behaviours are

fundamentally different from both symptom severity and impairments in functioning. Risk

behaviours are behaviours of the child that either actually or potentially put the child, or others in their environment, in harm's way. Risk behaviours include: elopement/runaway, criminal delinquency, and sexually abusive behaviours (Lyons, 1999; Lyons, Furrer, & Steiner, 2002).

Risk behaviours have been linked to service use intensity. Studies that conceptualize service use intensity as levels of care (i.e., restrictiveness of care setting) consistently found that risk behaviours predicted level of care (He, Lyons, & Heinemann, 2004; Lyons et al., 1997; Oswald et al., 2001). Less is known, however, about the influence of risk behaviours on service use intensity as defined as a number of visits. Hodges, Doucette-Gates, & Kim (2000) conceptualized service use intensity as both levels of care, and number of days spent in inpatient care. Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 1994a) scores, which contain measurement of child risk behaviours, significantly predicted both levels of care and number of days in inpatient care within the first 6 months following intake (Hodges, Doucette-Gates, & Kim, 2000). While this suggests a link between number of risk behaviours and number of mental health visits, this study only focused on number of days spent in inpatient care (i.e., highest level of care), which limits the generalizability of these findings (Hodges, Doucette-Gates, & Kim, 2000). Only one study (Burnett-Ziegler & Lyons, 2012) has linked risk behaviours and service use intensity, as defined only as a number of visits. Burnett-Ziegler & Lyons (2012) found that the presence of risk behaviours resulted in a greater number of visits over a 6-month period.

Risk behaviours can be viewed as a type of risk factor in general. In the development of psychopathology literature, risk factors referred to conditions in the child's spheres of socialization (e.g., family, school, neigbourhood, peers) that may adversely affect the child (Atzaba-Poria, Pike, & Deater-Deckard, 2004; Deater-Deckard et al., 1998; Gerard & Buehler, 2004; Sameroff, Seifer, & Baldwin, 1993). Examples would include low socioeconomic status,

parental marital difficulties, poor parent-child relationship, and poor peer relationships. The effects of risks have been considered to operate in two different ways in the literature. First, risks are suspected to exert their influence in a cumulative manner. For example, Rutter (1988) found a cumulative effect of risk on the development of psychiatric disorders. Children with any one risk factor in isolation were no more likely to develop psychiatric disorders than children with no risk factors. When any two risk factors occurred together, however, children's likelihood of developing a psychiatric disorder increased exponentially (Rutter, 1988). This model of cumulative risk has been used in a number of other studies (Atzaba-Poria, Pike, & Deater-Deckard, 2004; Deater-Deckard et al., 1998; Gerard & Buehler, 2004; Sameroff, Seifer, & Baldwin, 1993). This model, however, assumes that all risk factors are interchangeable, overlooking qualitative differences in risk factors. For this reason, risks have also been thought to exert their influences independently (Flouri, 2008). For example, there is research suggesting that negative parenting styles predict the development of psychopathology in children (Johnson & Greenburg, 2103; Koenig et al., 2002; Reiss et al., 1996; Schuppert et al., 2012)

Specific risk behaviours (as opposed to total number of risk factors) exert their effects on service use intensity independently. For example, Burk et al. (2011) found that children who display aggressive behaviours, particularly peer-to-peer bullying, use mental health services with greater intensity than children do not display such aggression. Victims of bullying had higher service use intensity than perpetrators of bullying, however, service use intensity was highest for children who were both victims and aggressors. This suggests that there may be something particularly important about behaviours that harm others in predicting service use intensity. Dean et al. (2008) found a similar relationship between aggressive behaviour and service use intensity of inpatient psychiatric care. Specifically, patients exhibiting aggressive behaviour at intake to a

child psychiatric ward had longer hospitalization periods than patients who did not exhibit aggression at intake.

Research on risk behaviours posing a danger to the child (i.e. self-injury, suicidal ideation, suicide attempts) also suggests that risk behaviours may influence service use intensity independently, however, this research yields less clear conclusions. One study (Kataoka et al., 2007) suggest that suicidal ideation and previous suicide attempts are less important than other risk factors in predicting service use intensity. Kataoka et al. (2007) found that environmental and social risk factors (i.e., sociodemographic variables, parental perception of service need) were more important in predicting service use intensity than previous suicide attempts. Other studies (Burnett-Ziegler & Lyons, 2012; Wu et al., 2001) found that suicidal ideation and suicide attempts were related to greater service use intensity. Wu et al. (2001) found that among children using mental health services for depression, those who had previously attempted suicide were more likely than those who had not to receive antidepressant medication. Burnett-Ziegler and Lyons (2012) found that children presenting with suicidal ideation had a greater number of visits to a mental health agency over 6 months than children presenting without suicidal ideation.

Only 2 (Frosh et al., 2011; He, Lyons, & Heinemann, 2004) studies have provided a sense of how risk behaviours may predict service use intensity differentially. Frosch et al. (2011) found that among children seen for emergency psychiatric consultation, children presenting with only non-suicidal behavioural problems (i.e., aggression, disruptive behaviours, or runaway history) were more likely than children presenting with only suicidal ideation or previous suicide attempts to report other current mental health service use. He, Lyons, & Heinemann (2004) found that children presenting with past suicide attempts, severe danger to others, or a history of running away from home were more likely to be hospitalized than children presenting with other risk behaviours on the Child Severity of Psychiatric Illness scale (CSPI; Lyons, 1995). These findings

illustrate that little is known about whether certain risk behaviours are better predictors of service use intensity than others, or if risk behaviours predict service use intensity with equal efficacy. Thus, the current study aimed to examine how a variety of risk behaviours differentially predict service use intensity.

No studies have examined the relationship between risk behaviours and patterns of service use over time. If risk behaviours at intake predict service use intensity uniformly over time, this could suggest that they are good long-term predictors of service use. Alternatively, risk behaviours might predict service use only at specific time periods following the onset of treatment. First, if risk behaviours predict increases in service use over time, it may be that risk behaviours at intake reflect complex problems that reveal themselves more clearly as treatment progresses. Second, if risk behaviours predict decreases in service use intensity over time, it may be that early identification of risk behaviours allows for treatment to target and reduce those behaviours effectively and efficiently. To date, no studies have examined the flux or stability of service use intensity over the course of children's mental health treatment based on the number, and type, of risk behaviours that children present at intake. Additionally, no studies have examined the nature by which risk behaviours differentially affect children's service use intensity over the course of their treatment. Thus, the current study takes temporal patterns of service use into consideration when examining the relationship between service use intensity and multiple risk behaviours.

The Current Study

The current study examines mental health service use intensity (i.e., number of visits to a mental health agency) during the first year of treatment among children with mental health problems. The current study aims to gain a preliminary understanding of how risk behaviours identified at intake may relate to the flux or stability of service use intensity over time. Other

studies have examined how risk behaviours relate to service use intensity immediately after intake (He, Lyons, & Heinemann, 2004; Lyons et al., 1997; Oswald et al, 2001), or after a long period of time (Burnett-Ziegler & Lyons, 2012; Hodges, Doucette-Gates, & Kim, 2000). As the relationship between risk behaviours and changes in number of mental health visits over time has not been previously examined, a period of one year was deemed to be a reasonable starting point given that a substantial proportion (51%) of children use CAMHS for less than 1 year (Reid et al., 2011).

Service use intensity was examined in two ways. First, consistent with previous research using a number of visits conceptualization of service use intensity (Costello et al., 1997; Hodges, Doucette-Gates, & Kim, 2000; Behar et al., 1996), it was examined as the total number of visits over 1 year. Second, to better understand variation over time, service use intensity was also examined as the number of visits per two-month periods. Risk behaviours were examined cumulatively as well as individually to explore which conceptualization better predicts service use intensity. In order to address limitations of research on the relationship between specific risk behaviours and service use intensity, multiple risk behaviours were examined.

Due to varying views in past literature on the relationship between risk behaviours and service use intensity, and the lack of research that has examined how this relationship changes over time, specific directional hypotheses would not be strongly empirically supported. As such, the current study presents explorative research objectives.

Research Objectives

(1) Determine if there is a relationship between children's risk behaviours and their service use intensity (i.e., total number of visits over 1 year)

(2) Determine if this relationship can be better explained by the combination of multiple risk behaviours in total or the influence of specific risk behaviours examined separately.

(3) Determine how the influence of risk behaviours on service use intensity changes over

children's first year of treatment per 2-month periods.

Methods

The Principal Study

Secondary analyses of data collected in a study examining patterns of service use in child

mental health care (Reid et al., 2011) were conducted. The principal study aimed to examine

CAMHS use over extended periods of time (i.e., 5 years). As such, methodological details of the

principal study will be described first, followed by details related to the current study. The

principal study contained 2 levels of inclusion/exclusion criteria: (a) selection of mental health

agencies, and (b) selection of children receiving mental health services.

Selection of Ontario mental health agencies. All participating ($N = 6$) agencies were

contacted by researchers and interviewed for their fit with inclusion criteria. Agencies were

located in both urban and rural areas. Inclusion criteria were: (a) served children between the

ages of 4 and 16; (b) accredited by Children's Mental Health Ontario (CMHO) or a similar

accreditation body [e.g., Canadian Council on Healthcare Services Accreditation (CCHSA)]

(Reid et al., 2011).

Selection of visit dates of children receiving care. Information on 8,391 children

receiving mental health services was extracted from archival data of the participating agencies.

Included participants were at least 4 years of age and younger than 12 years of age at the time of

their first visit. Age restrictions at time of first visit were in place to ensure that children did not

"age out" of an agency, resulting in non-random attrition. That is, children would not mature

beyond the age of 16 by the end of the data collection period. Although all participating mental

health agencies had cutoff ages of 18, the principal study truncated these at 16 because of the

variability in the mental health care that children between the ages of 16 and 18 may receive

(Reid et al., 2011). Truncating cutoff scores ensured that this variability did not influence findings. Children diagnosed with, or receiving services for developmental problems (e.g. Autism Spectrum Disorder) were excluded.

Only children whose first visit to a mental health agency occurred in 2004, 2005, or 2006 were included. First visit was operationalized as a child's initial face-to-face visit with an agency, with no other face-to-face visits having occurred in the previous 24 months (Reid et al., 2011). Telephone calls and other correspondences were excluded, as it was unclear whether these contacts were purely administrative or if treatment was received (Reid et al., 2011). All visit data for 5 years following the first visit were obtained (Reid et al., 2011).

The principal study (Reid et al., 2011) found 5 patterns of service use: Minimal, Acute, Intensive, Delayed Engagement/Episodic-Brief Treatment, and Ongoing/Episodic – Intensive Treatment. Although these patterns were not specifically examined in the current study, they were used in selecting a subsample of children for whom chart reviews were conducted. For the chart reviews, a stratified random sample [based on age group (4 to 7 years and 8 to 11 years), sex, and service use pattern] of 60 participants was extracted from each agency, resulting in a sample of 360 participants.

Procedures. Researchers reviewed charts of the participants to gain understanding of children's dispositions at the beginning of treatment. First visit dates were used as a reference point to adjudicate which charts were appropriate to use in completing intake reviews. Standardized chart review forms were created to extract relevant information from appropriate charts (e.g. basic demographic and clinical information). A paper-based chart review form was used for one agency, while charts from the others were reviewed using an electronic version of the chart review form (Reid et al., 2011). No identifying information was abstracted during these reviews.

The Current Study

     Participants. Of the 360 children in the principal study (Reid et al., 2011), 9 participants were excluded because of missing data. Thus, a total of 351 participants were included in the current study.

     Measures.

     Demographics. Child age and sex was obtained from administrative data.

     Mental health visits. Visit dates (day-month-year) were extracted from administrative data, as was the type of each contact (face-to-face, telephone call, etc.), and the type of service provided (treatment, consultation, etc.). This was done in 2 stages. First, agency administrative staff cleaned data to remove any small errors. Second, researchers selected only visit dates that fit inclusion criteria (Reid et al., 2011). For each participant, first visit date was computed as "day 1". Visit dates included in analysis began at this point and continued for 5 years. Each day included record of whether or not a participant visited a mental health agency. Although data for up to 5 years were obtained in the principal study, the current study examined only visit dates occurring over one year. Pseudomonths were also created in the current study. These were formed by dividing 365 visit days into 12 groups. These groups were then combined to form 2-month periods (i.e., moths 1-2, months 3-4, months 5-6, etc.). This was done to assess changes in service use intensity over time.

     Risk Behaviours. Child and Adolescent Needs and Strength Scale – Mental Health (CANS-MH; Lyons, 1999) scores were obtained in chart reviews by means of research assistants (RAs) using a standardized CANS-MH rating scale while examining participants' charts. RAs completed a standardized online training course in CANS-MH scoring, and were trained by expert CANS-MH coders. RAs demonstrated a reliability score of .70 or above in vignette practice in order to complete training. While reviewing charts, raters had copies of the CANS-

MH manual on hand, and were instructed to round scores down when unsure or lacking evidence. Interrater reliability was conducted on every sixth chart. The intra-class correlation across raters for the CANS-MH total score was $r = .94$ (Reid et al., 2011).

Only the risk behaviours subsection of the CANS-MH was used in the current study. This subsection contains 6 risk behaviours that are scored on a 4-point Likert scale $(0 - 3)$ in terms of action needed to correct risk behaviours. 0 indicates no need for action, 1 indicates a need for watchful waiting, 2 indicates a need for action, and 3 indicates a need for immediate action. To capture the presence of risk behaviours at intake, CANS-MH risk behaviours were recoded. Scores of 0 or 1 were coded as an absence of that behaviour. Scores of 2 or 3 were coded as a presence of that behaviour. Present risk behaviours were summed to compute total number of risk behaviours.

Data Analyses. The sample was weighted using normalized sample weights so that results could be generalized to the initial sample taken in the original report (Reid et al., 2011). After weighting, the sample size changed from 351 to 356 due to variations in sampling error. Preliminary analyses were conducted to determine how best to analyze number of risk behaviours, total service use intensity, and service use intensity over time based on their distributions. Preliminary analyses also identified specific risk behaviours that appeared to be of importance. Chi-square analyses were conducted to compare service use intensity (low, moderate, and high) of children with low, moderate, and high numbers of risk behaviours. Chi-square analyses were also run to compare service use intensity (low, moderate, and high) of children with specific risk behaviours that appeared important in preliminary analyses. To assess how the relationship between risk behaviours and service use intensity changed over time between and within group comparisons of risk behaviour groups were conducted across 2-month periods using Kruskal-Wallis analyses and post-hoc tests.

Results

Preliminary Analyses

The sample ($N = 356$) was 67.6% male, and the average age of participants was 8.15 years old ($SD = 2.08$). Total number of visits over the first year of treatment ranged from 1 to 123, with a median of 6.00 visits. More than half of participants (64.4%) presented with 0 risk behaviours. The remaining participants (35.4%) presented with at least 1 risk behaviour. Of participants presenting with at least 1 risk behaviour, 84.9% presented with Danger to Others (30.1% of the total sample). Of participants who presented with Danger to others, 59.8% presented with only Danger to Others, and 40.2% presented with Danger to others and additional risk behaviours. A very small portion (5.3%) of participants presented with 1 or more risk behaviours that did not include Danger to Others.

Due to skewness in the distribution of overall service use intensity (i.e., total number of visits), and the distribution of number of present risk behaviours, these variables were re-categorized into groups. Overall service use intensity was grouped into: (a) low (6 or less visits), (b) moderate (between 7 and 12 visits), and (c) high (greater than 12 visits). These groups were defined based on quartile splits, wherein the low group encompassed the first and second quartile (see Figure 1). Number of present risk behaviours was grouped into: (a) low risk (0 risk behaviours present), moderate risk (1 risk behaviour present), and high risk (greater than 1 risk behaviour present). These groups were formed with Rutter's (1988) cumulative risk theory in mind. Rutter (1998) suggests that risks become high when they occur together. As such, a combination of 2 or more risk behaviours was deemed to be high for the current study. To assess differences in service use intensity over time, the first year of treatment was grouped into 2-month periods. 2-month periods were chosen based on a significant decrease in service use intensity over the first 2 months of service involvement, which was observed for all groups.
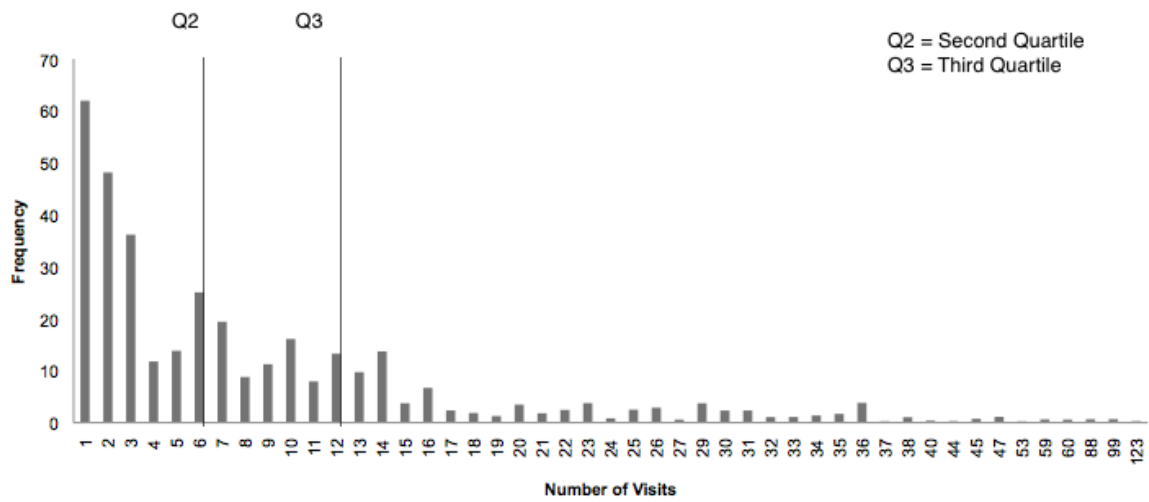
Figure 1. Cutoff points for grouping total service use intensity by quartiles in the distribution of number of visits over 1 year. Only second and third quartiles shown because groups were created using only these. Q1 = 2.00.

Risk Behaviours and Overall Service Use Intensity

A chi-square analysis was performed to assess the relationship between low, moderate, and high numbers of present risk behaviours and overall service use intensity. As shown in Table 1, there was a significant relationship between number of present risk behaviours and service use intensity, $X^2(4, N = 356) = 24.08, p < .001$. It is important to note, however, that the majority of children who presented risk behaviours presented Danger to Others.

Danger to Others and Overall Service Use Intensity

There was a significant relationship between the presence of the risk factor "Danger to Others" and service use intensity, $X^2(4, N = 356) = 22.67, p < .001$. However, as can be seen in Table 2, clear patterns across cells are not apparent. Since the analysis is significant, we would expect to see increasingly smaller proportions of children without Danger to Others as we move from the low service use intensity group to the moderate and the high. We would also expect to see increasingly larger portions of children with Danger to Others as we move from the low service use intensity group to the moderate and the high. Although the first pattern is observed, the second is not. Instead, children in the bottom 2 rows of Table 2 appear to be relatively evenly distributed across service use intensity categories.

Post hoc analyses were conducted to determine which Danger to Others groups differed from each other in the overall chi-square analysis. Children who presented only Danger to Others had significantly higher service use intensity than children who did not present Danger to Others, $X^2(2, N = 313) = 6.93, p = .031$. Children who presented Danger to Others and additional risk behaviours did not have significantly higher service use than children who presented only Danger to Others, $X^2(2, N = 108) = 3.04, p = .22$.

Danger to Others and Service Use Intensity over Time

Table 1.

Number of Risk Behaviours vs. Overall Service Use Intensity in 1 Year

Number of Present Risk Behaviours	Intensity Level		
	Low	Medium	High
0 risk behaviours present	39.9%	14.0%	10.4%
1 risk behaviour present	11.5%	4.8%	6.7%
>1 risk behaviour present	3.9%	2.8%	5.9%

Table 2.

Danger to Others Groups vs. Overall Service Use Intensity in 1 Year

Risk Behaviour Group	Intensity Level		
	Low	Medium	High
Danger to Others Absent	43.4%	14.3%	12.0%
Only Danger to Others present	8.1%	4.5%	5.3%
Danger to Others and 1 or more additional risk behaviour	3.9%	2.8%	5.6%

Note. N = 356. Cell percentages based on total sample.

Trends in service use intensity over the first year of treatment were observed for children who did not present Danger to Others, children who presented only Danger to Others and children who presented Danger to Others and 1 or more additional risk behaviour. As can be seen in Figure 2, different trends for each group emerged. All groups decreased in service use intensity after the first 2 months of service involvement, and between group differences emerged later in the year. That is, after the initial, universal drop in service use intensity, children who presented with Danger to Others and 1 or more additional risk behaviour had the highest intensity, followed by children who presented with only Danger to Others, and then children who presented with 0 risk behaviours or risk behaviours that were not Danger to Others. Spikes in service use intensity occurred in months 7-8 for children who presented Danger to Others and 1 or more additional risk behaviour, and months 9-10 for children who presented with only Danger to Others.

Between group comparisons. Kruskal-Wallis analyses were performed for each 2-month block to determine at which points in the first year of service involvement Danger to Others groups differed in their service use intensity. Significant differences between groups were found in months 7-8, $X^2(2, N = 356) = 18.02, p < .001$, months 9-10, $X^2(2, N = 356) = 26.35, p < .001$, and months 11-12, $X^2(2, N = 356) = 28.61, p = .001$. Groups did not differ significantly in months 1-2, $X^2(2, N = 356) = 1.33, p = .51$, months 3-4, $X^2(2, N = 356) = 4.62, p = .10$, or months 5-6, $X^2(2, N = 356) = 5.73, p = .06$. In significant 2-month blocks, post hoc tests were conducted to compare children who did not present Danger to Others to children who presented only Danger to Others, and children who presented only Danger to Others to children who presented Danger to Others and one or more additional risk behaviour. The Bonferroni correction was applied to control for type I errors, making p-values less than .025 significant. Children presenting only Danger to Others had significantly higher service use intensity than children who did not present
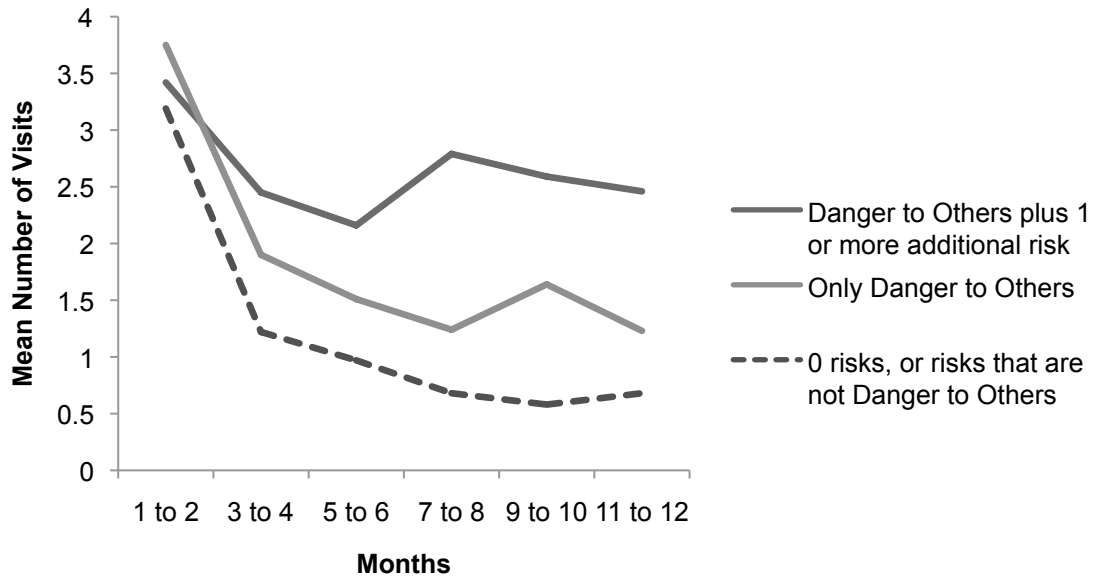
Figure 2. Service use intensity (i.e., number of visits) over first year of service

involvement for children presenting with and without Danger to Others.

Danger to Others in months 9-10, $X^2(1, N = 293) = 12.21$, $p < .001$, and months 11-12, $X^2(1, 293)$

$= 6.06$, $p = .014$, but in months 7-8, these groups did not differ significantly, $X^2(1, N = 293) =$

3.72, $p = .054$. Children presenting Danger to Others and one or more additional risk behaviour

had significantly higher service use than children presenting only Danger to Others at months 11-

12, $X^2(1, 95) = 5.56$, $p = .018$, but these groups did not differ significantly in months 7-8, $X^2(1, N$

$= 95) = 3.87$, $p = .05$, or months 9-10, $X^2(1, N = 95) = 1.79$, $p = .18$.

Within-group comparisons. Kruskal-Wallis analyses were performed to determine how

service use intensity changed over time within Danger to Others groups. There was a significant

decrease in service use intensity for all groups between months 1-2 and 3-4: children who did not

present Danger to Others $X^2(1, N = 474) = 123.22$, $p < .001$; children who presented only Danger

to Others $X^2(1, N = 112) = 20.89$, $p < .001$; children who presented Danger to Others and one or

more additional risk behaviour $X^2(1, N = 78) = 7.60$, $p = .006$. Children who did not present

Danger to Others saw a significant decrease in service use intensity between months 3-4 and 5-6,

$X^2(1, N = 474) = 7.06$, $p = .008$. All other comparisons were non-significant.

Discussion

A significant relationship between children's risk behaviours presented at intake and their

mental health service use intensity was found. Nearly all children who presented with at least 1

risk behaviour presented with Danger to Others (84.9%), which involves actual and threatened

verbal and physical aggression toward people in the child's life (Lyons, 1999). Previous studies

(Burk et al., 2011; Dean et al., 2008) have demonstrated that children who display aggressive

behaviours (e.g., bullying, verbal aggression, physical violence toward others) use mental health

services more intensely than children who do not exhibit such behaviours. Because Danger to

Others encompasses similarly aggressive behaviours (e.g., threatened and/or actual physical and

verbal violence), the relationship between Danger to Others and service use intensity observed in the current study is consistent with these findings.

When Danger to Others was examined specifically, it was found to significantly predict overall service use intensity across children's first year of service involvement. Despite the significance of this finding, there did not appear to be a clear pattern. Chi-square analysis demonstrated that far more children who presented without Danger to Others were in the low service use intensity group, with increasingly less in the medium and high service use intensity groups, respectively. Children who presented with only Danger to Others, and children who presented with Danger to Others and additional risk behaviours were evenly distributed across service use groups. If a clear pattern were present, we would expect the amount of children in the medium and high service use intensity groups to be higher than the amount of children in the low service use intensity group for children who presented with Danger to Others. When the relationship between Danger to Others and service use intensity was examined across 2-month periods clearer patterns in service use intensity among children with different presentations of Danger to Others were observed. These differences became apparent only in the later portion of the year, which could explain the lack of pattern observed in analyses of overall service use intensity (i.e., number of visits across the whole year). This is because chi-square analyses examined service use intensity across the year as a whole, as opposed to examining its shorter-term changes. The fact that differences in service use intensity did not become significant until the end of the year means that these differences are only a small portion of service use intensity captured by the chi-square analysis, while months in which the groups do not differ significantly comprise a larger portion. When combined, the non-significant months contribute much more to the overall analysis than the significant months do.

These findings suggests that examining temporal patterns in service use paints a clearer picture of how risk behaviours predict service use intensity than does examination of total service use across a large period of time. If the presence of risk behaviours predicts service use intensity differentially over short periods of time, analyzing this relationship across long periods of time may mask these subtle changes by lumping together times at which service use differs significantly and times at which it does not. Furthermore, because previous studies have only measured the relationship between service use intensity and predictor variables across large chunks of time (i.e., 6 months to 5 years), they may have obscured the relationship between service use intensity and predictor variables. Had previous studies examined these relationships temporally, findings similar to that of the current study may have appeared.

Temporal patterns of intensity over the first year of service involvement differed for children who did not present with Danger to Others, children who presented with only Danger to Others, and children who presented with Danger to Others and 1 or more additional risk behaviour in 2 ways. First, all groups significantly decreased in their service use intensity between months 1 to 2 and months 3 to 4. Universal decreases in service use intensity after the first 2 months of service involvement may be attributable to heightened service use in the intake and treatment planning stages of treatment. When children begin receiving CAMHS, information about their needs, strengths, and presenting problems need to be collected so that appropriate services can be provided. It might be that, despite intake questionnaires, clinicians need a bit of time to interact with a patient to feel that they can make decisions about future treatment confidently. In an effort to begin appropriate treatment as quickly as possible, these visits, which intend to gauge important aspects of the patient, might be packed as close as possible. One study, involving the treatment course of youth with depression (Emslie, Kennard, & Mayes, 2011), seems to support this notion. This study demonstrated that response to treatment in the first 12

weeks of service involvement is important for predicting the remission of depression in youth. It suggested that clinicians use treatment response early in service involvement to inform subsequent treatment decisions. An alternative explanation could be that children who use CAMHS less intensely drop out after their first 2 months of use, leaving only more intense users to be analyzed in later months.

Second, significant between group differences did not emerge until months 9-10. This might also be explained by the notion that clinicians use the early portion of the year to determine appropriate courses of treatment given children's needs, strengths, and presenting problems. After clinicians have made decisions regarding treatment, they may feel that easing children into more intensive services is best because, qualitatively, these services may be different than services in the first 2 months. It could be that early service is intended to uncover issues, while later service is intended to resolve them. As this type of resolution may be mentally tiring for children, clinicians may ease into decisions regarding service use intensity for the benefit of their patients.

Finally, findings from the current study demonstrate that risk behaviours are linked to service use intensity as defined as a number of visits. There has only been one study (Burnett-Zeigler & Lyons, 2012) that found the type of risk behaviours that children presented predicted their service use intensity as defined as a number of visits. Findings from the current study are consistent with this research. The current study therefore provides additional support to a small body of literature that extends the relationship between risk behaviours and service use intensity from a level of care (i.e., restrictiveness of care setting) definition of service use intensity to a number of visits one.

Limitations

The current study presents multiple methodological limitations. First, risk behaviours were measured only at intake. The current study demonstrates that risk behaviours presented at intake predict fluctuations in service use intensity over children's first year of service involvement; however, it does not indicate whether fluctuations in service use intensity correspond with fluctuations in risk behaviour presentations. Thus, a repeated measures design might capture the relationship between risk behaviours and service use intensity more completely. Such a study would measure the presence and absence of CANS-MH risk behaviours, as well as the number of visits a child has made to a mental health agency, at each 2-month interval. If spikes and dips in service use intensity corresponded with increased and decreased amounts of present risk behaviours it could be concluded that the number of risk behaviours a child presents is a strong predictor of their mental health service use intensity. If spikes and dips in service use intensity correspond with changes in the presence and absence of Danger to Others, it can be concluded that Danger to Others is a strong predictor of children's mental health service use.

Second, lack of patterns observed in overall chi-square analyses of Danger to Others and service use intensity suggest that chi-square analyses may not adequately capture this relationship. When risk behaviours and service use intensity were examined over time, a clear relationship appeared to exist. This was obscured by the chi-square analysis, because the chi-square analysis examined the observed relationship across cells that captured service use intensity as a whole. A multinomial logistic regression would be an alternative data analytic approach that would test how the increases in risk might be related to increases in service intensity. This could be more informative, however, it would still have its limitations. Any analysis that examines overall service use intensity across large chunks of time (as chi-square and multinomial logistic

regressions would) potentially obscures the relationship between risk behaviours and service use intensity. Temporal analyses of service use intensity still capture this relationship most optimally.

Finally, it is possible that there are limitations to the CANS-MH. Rautkis & Hdalio (2001) found that scores on the CANS-MH correlate highly with scores on the Child and Adolescent Function Assessment Scale (CAFAS; Hodges, 1994a). The CAFAS, like the CANS-MH, was designed to assess clinically relevant needs and strengths of children. This suggests that, overall, the CANS-MH is a valid measure; however, no research focuses on the validity of risk behaviours in particular. It may be the case that CANS-MH risk behaviours lack adequate discriminate validity. Danger to Others encompasses aggressive behaviours, but arguably, so does criminally delinquent and sexually abusive behaviour – both risk behaviours included in the CANS-MH. This could mean that risk behaviours observed in the current study were more diverse than they appeared. If this were the case, Danger to Others may not be as important in predicting service use intensity as the current study suggests. Instead, a variety of risk behaviours may be important in predicting service use intensity. Alternatively, there could be broader constructs that underlie multiple CANS-MH risk behaviours. In this case, these constructs would be the salient factors that predict service use intensity.

Future Research

Future research could address limitations of the current study, and extend its findings in a number of ways. First, studies examining the discriminant validity of CANS-MH risk behaviours would be beneficial because these behaviours are important in examining how child-specific risk factors predict CAMHS use. Evidence suggesting that CANS-MH risk behaviours measure distinct constructs would allow for precise conclusions to be drawn about the effects that each behaviour exerts on service use intensity. Evidence suggesting that CANS-MH risk behaviours are overlapping could lead to examination of the constructs underlying risk behaviours, and

possibly to the combination of some of the risk behaviours currently presented in the CANS-MH.

For instance, if the actual or potential infliction of harm on others underlies many CANS-MH

risk behaviours, these could be combined to create one type of risk behaviour. If the actual or

potential infliction of harm on oneself underlies many CANS-MH risk behaviours, these could be

combined to create a second type of risk behaviour.

Second, Future research could aim to uncover qualitative differences in early service

involvement (i.e., the first 2 months of service involvement), compared to later service use.

Measuring risk behaviours repeatedly over the course of service involvement could do this.

Repeated measures of other variables (e.g., nature of visits, psychiatric diagnosis, etc.) could also

be taken.

Third, future studies should focus more on temporal patterns in service use intensity as

predicted by risk behaviours. This would direct the literature toward a more comprehensive

understanding of how children's risk behaviours influence their service use intensity. Finally, the

current study only examined the relationship between risk behaviours and service use intensity up

to 1 year after initial service involvement. Given that between group differences in service use

intensity did not emerge until months 9-10, future research could extend the time frame for

examining the relationship between risk behaviours and CAMHS use over time beyond 1 year.

Repeated measures should also be employed in this research to address limitations of the current

study.

Implications

Findings from the current study could inform treatment planning in child mental health

care. Given higher overall service use intensity for children who presented with Danger to

Others, differences in service use intensity over time for children who presented with and without

this risk behaviour, and substantial decreases in service use intensity after the first 2 months for

all participants, the current study suggests that children who present to child mental health agencies with Danger to Others may have more persistent or severe needs for mental health services than children who do not present with this risk behaviour. As such, screening for Danger to Others prior to providing treatment could indicate which children are in need of more intensive services.

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Appendix A.

Intake Chart Review Materials

INTAKE

Relevant Dates on Record

1	First recorded date post 1/1/2000 (mmm/dd/yyyy)	Check one: ☐ Phone ☐ Face-to-face Check one: ☐ Intake ☐ Other: _____
2	Date of first face-to-face contact (mmm/dd/yyyy)	
3	Date of intake summary (mmm/dd/yyyy)	☐ None
4	Date of BCFPI (mmm/dd/yyyy)	☐ None
5	If no intake summary or BCFPI date of last flagged 'intake' (mmm/dd/yyyy)	

Intake Demographic Information

(sample subsections)

Postal Code (first 3 digits)			
Country of Birth	☐ Canada ☐ Other:	☐ Unknown	
Primary Language	☐ English ☐ French ☐ Other: _____		
Marital Status	☐ Single Parent ☐ Never married ☐ Separated ☐ Divorced ☐ Widowed ☐ Unknown ☐ Married ☐ Common-law		
Has Custody	☐ Birth Mother ☐ Birth Father ☐ Grandmother ☐ Grandfather ☐ Common-law Mother ☐ Common-law Father	☐ Step-Mother ☐ Step-Father ☐ Aunt ☐ Uncle ☐ Other relative Who?	☐ Foster Mother ☐ Foster Father ☐ Adoptive Mother ☐ Adoptive Father ☐ CAS (Crown Ward) ☐ Guardian –not related
Living arrangement	☐ Parents ☐ Extended Family ☐ Foster Care ☐ Group Home	☐ Residential Care ☐ Inpatient crisis at general hospital ☐ Inpatient crisis at CMH centre	☐ Youth Justice System (Custody) ☐ Not Specified

Intake Psychiatric Diagnoses

☐ None	☐ Substance Abuse
☐ Adjustment Disorder	☐ Antisocial Behavior
☐ ADHD	☐ Anxiety Disorder:_____
☐ ODD	☐ Depression
☐ Conduct Disorder	☐ Learning Disability:_____
☐ Tourettes Disorder	☐ Other:_____
	_____

INTAKE: Other Sector Involvement

(sample subsections)

Any record of involvement in **previous year** of post-2000 intake?	☐ Mental Health ☐ Health ☐ Education ☐ Justice ☐ CAS ☐ Other
	☐ None: Go to CANS-MH on p.8

☐ Health: Has child seen any of the following for mental health concerns?

	Yes	No Record	If Yes:		
Family Physician	O	O	☐ Ongoing involvement	☐ Concluded	☐ Unknown
Psychiatrist	O	O	☐ Ongoing involvement	☐ Concluded	☐ Unknown
Paediatrician	O	O	☐ Ongoing involvement	☐ Concluded	☐ Unknown

☐ CAS Reason for involvement:

		Yes	No
Respite		O	O
	Alleged	Substantiated	
Sexually abused	O	O	O
Physical abuse	O	O	O
Neglect	O	O	O
Witness to domestic violence	O	O	O
Other:	O	O	O
_____			
Other:	O	O	O

Level of involvement:
  ☐ Temporary care ☐ Supervision ☐ Crown Ward ☐ Unknown

Reid et al. (2011)

Appendix B.

Intake CANS-MH Form

CHILD AND ADOLESCENT NEEDS AND STRENGTHS (CANS-MH) INTAKE
(sample subsections)

PROBLEM PRESENTATION	0	1	2	3	U	NA
1. Psychosis	O	O	O	O	O	
2. Attention Deficit/Impulse	O	O	O	O	O	
3. Depression/Anxiety	O	O	O	O	O	
4. Oppositional Behavior	O	O	O	O	O	
5. Emotional Control	O	O	O	O	O	
6. Antisocial Behavior	O	O	O	O	O	
7. Substance Abuse	O	O	O	O	O	
8. Adjustment to Trauma	O	O	O	O	O	
9. Attachment	O	O	O	O	O	O
10. Anger Control	O	O	O	O	O	
11. Situational Consistency	O	O	O	O	O	
12. Temporal Consistency	O	O	O	O	O	
RISK BEHAVIORS	**0**	**1**	**2**	**3**	**U**	
13. Danger to Self	O	O	O	O	O	
14. Danger to Others	O	O	O	O	O	
15. Elopement	O	O	O	O	O	
16. Sexually Abusive Behavior	O	O	O	O	O	
17. Social Behavior	O	O	O	O	O	
18. Crime/Delinquency	O	O	O	O	O	
STRENGTHS	**0**	**1**	**2**	**3**	**U**	**NA**
39. Family	O	O	O	O	O	
40. Interpersonal	O	O	O	O	O	
41. Relationship Permanence	O	O	O	O	O	
42. Educational	O	O	O	O	O	
43. Vocational	O	O	O	O	O	O
44. Well-being	O	O	O	O	O	
45. Optimism	O	O	O	O	O	
46. Spiritual/Religious	O	O	O	O	O	
47. Talents/Interests	O	O	O	O	O	
48. Inclusion	O	O	O	O	O	

General item ratings *(NB. specific items have more detailed descriptions of levels)*
'0' indicates *no need for action*
'1' indicates *a need for watchful waiting* to see whether action is needed (i.e. flag it for later review to see if any circumstances change) or prevention planning
'2' indicates *a need for action*
'3' indicates the need for either immediate or intensive action

Reid et al. (2011)