RESEARCH ARTICLE

BCFPI Validation for a High-risk High-needs Sample of Children and Youth Admitted to Tertiary Care

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Abstract

Objective: This study examined the validity and reliability of the Brief Child and Family Phone Interview (BCFPI) in a sample of high-risk, high-need children and youth admitted to a tertiary residential psychiatric facility. This is the first validation study of the BCFPI with children and youth functioning at the extreme clinical range. **Method:** Participants consisted of children and youth in a southwestern Ontario tertiary residential mental health facility. Two hundred twenty seven children and youth aged 6.28 to 16.74 (M = 12.06 years, SD = 2.46) were evaluated. Internal consistencies of each scale were tested using Cronbach's alpha, and subsequently confirmed with unidimensional principal components analyses. Concurrent validity was evaluated through Pearson product-moment correlations between each subscale and the empirically validated subscales in the Conners' Rating Scales. **Results:** With exception of the conduct subscale (alpha =.68), all Cronbach's alpha estimates were in the acceptable range. Each scale demonstrated acceptable factor loadings on a single-factor principal components extraction derived from the pool of items within each scale. Concurrent validity was evidenced by moderate to strong correlations identified with selected measures of the Conners' Parent Rating Scale. **Conclusions:** Considered together, the results of this study indicate that the BCFPI is a reliable and valid indicator of child functioning within this client population, and is recommended in the assessment of tertiary populations.

Key Words: *Brief Child and Family Phone Interview (BCFPI), validation, tertiary care*

Résumé

Objectif: Cette étude a examiné la validité et la fiabilité de la Brief Child and Family Phone Interview (BCFPI, enquête téléphonique abrégée pour l'enfant et la famille) dans un échantillon d'enfants et d'adolescents à haut risque et à besoins élevés, hospitalisés dans un établissement psychiatrique résidentiel tertiaire. Il s'agit de la première étude de validation de la BCFPI pour des enfants et des adolescents fonctionnant à l'extrémité de l'échelle clinique. **Méthode:** Les participants étaient des enfants et des adolescents dans un établissement de santé mentale résidentiel tertiaire du Sud-Ouest de l'Ontario. Deux cent vingt-sept enfants et adolescents âgés de 6,28 à 16,74 ans (M = 12,06 ans, ET = 2,46) ont été évalués. La cohérence interne de chaque échelle a été vérifiée à l'aide de l'alpha de Cronbach, et subséquemment confirmée par des analyses en composantes principales unidimensionnelles. La validité concourante a été évaluée par les corrélations produit-moment de Pearson entre chaque sous-échelle et les sous-échelles validées empiriquement des échelles d'évaluation Conners. **Résultats:** À l'exception de la sous-échelle des conduites (alpha = 0,68), toutes les estimations alpha de Cronbach étaient dans un intervalle acceptable. Chaque échelle démontrait des saturations de facteur acceptables sur une extraction d'un seul facteur par l'analyse en composantes principales, dérivée du groupe d'items de chaque échelle. La validité concourante a été mise en évidence par des corrélations de modérées à fortes, identifiées par des mesures choisies de l'échelle d'évaluation Conners pour les parents. **Conclusions:** Pris en compte ensemble, les résultats de cette étude indiquent que la BCFPI est un indicateur fiable et valide du fonctionnement de l'enfant au sein de cette population de clients, et qu'elle est recommandée pour l'évaluation des populations tertiaires.

Mots clés: *Brief Child and Family Phone Interview (BCFPI), validation, soins tertiaires.*

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Inpatient psychiatric care for children and youth is among the most intensive and costly services in the children's mental health system (Leon et al., 2000; Noftle et al., 2011; St. Pierre, Leschied, Stewart, & Cullion, 2008). Children and youth who receive inpatient psychiatric care typically present with a series of complex behaviours, including comorbid diagnoses (Green et al., 2007), problems with school and family functioning (den Dunnen et al., 2012), as well as co-occurring substance use and mental health problems (St. Pierre et al., 2008). In an effort to ensure that those with the greatest level of risk/need have access to this costly and important inpatient service, the province of Ontario, Canada has mandated the use of standardized assessment tools for all youth seeking access to *any* mental health service.

The Brief Child and Family Phone Interview (BCFPI) is one of the standardized assessment tools mandated by the province of Ontario, used to assess the families of children and youth seeking mental health services in Ontario (Cunningham, Pettingill, & Boyle, 2006). Adapted from the revised Ontario Health Study Scales (OCHS-R; Boyle et al., 1987; Boyle et al., 1993; Cunningham, Boyle, Hong, Pettingill, & Bohaychuk, 2009), the BCFPI is intended to help service providers and mental health professionals better understand the complex mental health needs of children and youth referred for mental health services. This measure can be used for intake screening, treatment planning and monitoring, and as an outcome measurement tool, and therefore has important implications for the triaging and allocation of our finite mental health services (Cunningham et al., 2009).

The BCFPI is a computer-assisted telephone interview administered to the parents of 3 to 18-year-old children and youth at the point of intake, prior to clinical assessment and treatment (Barwick, Boydell, Cunningham, & Ferguson, 2004). The BCFPI is a structured interview that provides mental health professionals with standardized scale (T) scores based on community and clinical samples. The BCFPI examines behaviour and emotional adjustment, which includes attention-deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), conduct disorder (CD), separation anxiety disorder (SAD), generalized anxiety disorder (GAD), and major depressive disorder (MDD). Because the BCFPI is not appropriate for diagnostic purposes, the names of the subscales were given more descriptive titles – for example, the scale most relevant to ADHD was given the name regulation of attention, impulsivity, and activity (Cunningham et al., 2009; Cunningham et al., 2006). Additional items examined by the BCFPI are child functioning, which includes child's social participation, quality of child's relationships, child's school participation and achievement; and the impact of family, which includes family activities and family comfort (Cunningham et al., 2006).

There are some noteworthy advantages associated with using the BCFPI. First, the BCFPI measures a wide array of functioning, including those mentioned above (i.e., mental health problems, child and family functioning) as well as child and family risk factors, protective factors, and barriers for treatment (Cunningham et al., 2006). Second, the BCFPI makes a great deal of practical sense given that it can be implemented in a relatively short period of time (approximately 45 minutes). Only items that are most useful for intake screening, priority setting, triaging, service planning, and outcome assessment were included in the measure (Cunningham et al., 2009). In addition, the BCFPI is administered via the telephone, which has been demonstrated to lead to more favourable return rates at follow-up than traditional mail-in questionnaire responses (St. Pierre et al., 2008). Considered together, these advantages suggest that the BCFPI could reasonably be used as an outcome measure to evaluate the effectiveness of children's mental health services.

The creators of the BCFPI have assessed the reliability and validity of the measure (Boyle et al., 2009; Cunningham et al., 2009; Cunningham et al., 2006). Recently, Cunningham and colleagues (2009) examined the factor structure of the BCFPI, to determine whether mental health subscales of the BCFPI conformed to the hypothesized factor structure within the Ontario Child Health Survey (OCHS) population and clinical samples, as well as within the province-wide implementation sample collected when the BCFPI was initially developed. The OCHS-R community sample consisted of 1,714 children, and the clinical sample consisted of 1,512 children. The implementation sample consisted of 56,825 children and youth that had been referred to mental health service agencies. Each of the three samples had an age range of 6 to 18 years. Confirmatory factor analysis found comparable support for the item structure of the BCFPI mental health scales across all three samples, and found good internal consistency estimates for the subscales, thereby demonstrating the reliability, validity, and utility of the BCFPI in identifying mental health problems in children and youth.

Boyle and colleagues (2009) examined the concurrent validity of the BCFPI in comparison to the Diagnostic Interview Schedule for Children Version IV (DISC-IV). A sample of 399 children and adolescents referred to outpatient mental health services were administered the BCFPI at baseline, two months, and 13 months, and were assessed on the DISC-IV at one month and 12 months. Internal consistency reliability exceeded .80 for all the BCFPI subscales. In addition, test-retest reliability ranged from .45 (MDD) to .62 (SAD) for the BCFPI, demonstrating adequate reliability for the measure. With regards to validity, Pearson correlations between the DISC-IV and the BCFPI exceeded .65. The sensitivity, specificity, and predictive value of the BCFPI suggest that this measure is more accurate for externalizing disorders (CD, ODD, ADHD) than internalizing disorders (GAD, SAD, MDD), with Kappa estimates above .42 and below .38, respectively. This is consistent

with research examining the DISC-IV, a measure that also has difficulty classifying internalizing disorders. The ability of the BCFPI subscales to discriminate between DSM child mental disorders is comparable to the Child Behaviour Checklist (CBCL), a well-researched and popular child psychopathology assessment tool. The authors concluded that children mental health problems classified by the BCFPI are reasonably similar to disorders classified by the DISC-IV.

Despite this ancillary level of empirical psychometric support, the BCFPI has yet to be empirically substantiated in the context of a tertiary residential psychiatric facility, where the needs of (and associated risks for) the youth are arguably the greatest. For example, in Ontario, children and youth are referred to tertiary care facilities through specific local mental health agencies. This referral process utilizes standardized intake tools guided by the least intrusive intervention model of service delivery. Therefore, it is essential that community treatment efforts precede inpatient referral. This referral process is used to ensure that only the children and youth who have extreme needs, and are at high risk of permanent home and school breakdowns, are accepted into inpatient psychiatric care (St. Pierre et al., 2008). The purpose of this study is to assess whether the BCFPI is sensitive and reliable in a high-risk high-need sample of children and youth admitted to a residential psychiatric treatment facility in southwestern Ontario.

Method

Participants

The data for the current study were derived from a prospective study, and participants included the consecutive admissions of all children and youth aged 6-17 years accepted for inpatient treatment to a large regional (rural and urban catchment) children's mental health centre operated directly by the Ontario Ministry of Children and Youth Services between October 1, 2002 and July 1, 2006. Children diagnosed at referral with a developmental handicap were not a part of this study; otherwise, there were no diagnostic exclusionary criteria. The protocol and all consent documents were reviewed by the Health Sciences Research Ethics Board at the University of Western Ontario, and all participants (or their parents/guardians, in the case of minors) provided signed informed consent. In total, 227 children (171 boys), aged 6.28 to 16.74 (M = 12.06, SD = 2.46) were assessed within this sample.

The children and youth in this sample constitute an extremely high risk and high need population, with most requiring treatment for individual psychopathology concurrent with substantial deficits in functioning at home and at school. Table 1 summarizes the severity of symptoms on the BCFPI at intake for clients in this sample compared to children and youth who access outpatient services (data obtained via personal communication with Peter Pettingil, November 9, 2006). The differences are noteworthy, and while both samples reflect behavior well outside the 'normal range,' clients from the inpatient sample score substantially higher on all BCFPI subscales than those in the outpatient sample. Of particular interest, the children and youth from this inpatient psychiatric sample score more than two standard deviations higher than the outpatient clients on the broadband externalizing behavior subscale, the school participation and achievement subscale, and the global family situation subscale, indicating a range of problems that extend to a wide variety of different domains.

Table 1. Comparison of severity of symptoms on BCFPI at intake: inpatient residential vs. outpatient services

BCFPI subscale	Inpatient residential	Outpatient
Regulation of attention, impulsivity & activity	74.43	65.15
Cooperativeness	76.58	68.38
Conduct	93.66	67.79
Externalizing	83.07	69.87
Separation from parents	63.86	59.39
Managing anxiety	59.82	58.63
Managing mood	75.16	65.19
Internalizing	69.93	63.72
Social participation	84.49	69.58
Quality of relationships	75.66	62.79
School participation & achievement	79.67	63.00
Global functioning	86.07	68.49
Family activities	113.67	75.77
Family comfort	82.50	72.15
Global family situation	101.05	77.03

Table 2. Reliability statistics as a measure of internal consistency on Symptomatology Subscales in the BCFPI

Subscale	Cronbach's Alpha	Items
Regulation of attention, impulsivity & activity	.75	6
Cooperativeness	.77	6
Conduct	.68	6
Externalizing	.78	18
Separation from parents	.79	6
Managing anxiety	.83	6
Managing mood	.82	6
Internalizing	.83	18
Total mental health	.82	36

Table 3. Concurrent validity between BCFPI Subscales and Conners' Subscales

	Oppositional	Anxious/Shy	ADHD Index	Restless/ Impatient	Total
Impulsivity and activity	*0.33	0.07	*0.72	*0.70	*0.65
Cooperativeness	*0.67	0.01	*0.31	*0.28	*0.41
Conduct	*0.38	-0.12	*0.25	*0.24	*0.22
Separation from parents	0.09	*0.44	0.05	-0.01	0.04
Managing anxiety	-0.08	*0.29	0.02	-0.01	0.03
Managing mood	0.20	0.12	-0.01	-0.02	0.06
Externalizing	*0.63	-0.03	*0.55	*0.52	*0.55
Internalizing	0.11	*0.42	0.01	-0.02	0.07
Total mental health	*0.44	*0.29	*0.31	*0.26	*0.34

Notes: correlations indicated with an asterisk are significant at $p < 0.001$

Measures

Two measures were employed within this validation study: The BCFPI and the Conners' Parent Rating Scale. Within the BCFPI, we considered six of the most commonly used subscales: regulation of attention, impulsivity, and activity; cooperativeness; conduct; separation from parents; managing anxiety; and, managing mood. We also computed three higher-order scales from these subscales: externalizing (an aggregate of regulation of attention, cooperativeness, and conduct); internalizing (an aggregate of separation from parents, managing anxiety, and managing mood); and, total mental health (an aggregate of all six subscales). Concurrent validity was evaluated using five scales of the Conners' Parent Rating Scale: oppositional; anxious/shy; attention-deficit/hyperactivity; restless/impatient; and, total score.

Procedure

The parent or guardian of each child in the sample, prior to admission, completed the BCFPI. Within this sample, a subset of children was also evaluated with the Conners' Parent Rating Scale. To ensure comparability of results, concurrent validity analyses were restricted to those children that were evaluated by the same individual on both measures, and for whom the measures were completed no more than 30 days apart.

Statistical Analysis

The internal consistency of each scale was initially tested using Cronbach's alpha, and subsequently confirmed using a series of unidimensional principal components analyses. To ensure that extraction of only one factor was indicated within each of these principal components analyses, the eigenvalues associated with the extracted factors was evaluated against randomly generated eigenvalues that were created within a parallel analysis (Zwick & Velicer, 1986) that was conducted using MacParallel (Watkins, 2010). The concurrent validity of the BCFPI was then evaluated by calculating a Pearson product-moment correlation between each of the subscales and the empirically validated subscales in the Conners' Rating scales (Conners, 1997; Gianarris, Golden, & Greene, 2001). In order to control for the presence of a multiple comparison bias, the current research implemented a Bonferroni correction factor that adjusted the alpha to 0.001.

Results

Internal consistency estimates for each scale (Cronbach's alpha) are presented in Table 2. With the exception of the conduct subscale (alpha = 0.68), all measures demonstrate acceptable internal consistency reliability (Pedhazur & Schmelkin, 1991). The bivariate correlations between each BCFPI subscales and the five scales of the Conners' Rating scales are presented in Table 3. In general, the pattern of correlations follows the expectations of the research, affirming the concurrence between these two subscales. One notable exception exists: the managing mood subscale is not significantly associated with any Conners' subscale, including the oppositional subscale, with which it is theoretically linked. The non-significant correlation of .20, however, is largely a by-product of our restrictive alpha (intended to deal with the multiple comparison bias), and these two variables are best interpreted as being weakly correlated with one another.

All of the unidimensional factor analyses demonstrated a Kaiser-Meyer-Olkin score of 0.70 or more, suggesting that the association among the variables within the analysis is sufficiently large as to allow factor analysis. Within each of the unidimensional factor analyses, only one factor had a calculated eigenvalue that exceeded the randomly generated eigenvalues (within the parallel analysis), thus suggesting a unidimensional structure for each of the scales. The factor loadings for each analysis are presented in Table 4. With the exception of one item on the conduct measure ("Has broken into a house, building, or car"), all items demonstrate acceptable factor loadings.

Discussion

The current research set out to explore the reliability and validity of the BCFPI in an inpatient psychiatric care residential setting. Using data from a psychiatric residential facility in southwestern Ontario, we found acceptable Cronbach's alpha scores for all but the conduct subscale, indicating acceptable internal reliability consistency. Furthermore, each scale demonstrated acceptable factor loadings on a single-factor principal components extraction derived from the pool of items within each scale. Concurrent validity was evidenced by the moderate to strong correlations that were found with selected measures of the Conners' Parent Rating Scale.

These findings have potentially significant implications for evidence-based practitioners and managers within a residential psychiatric setting. First, given the finite resources available for children's mental health services, this research supports the BCFPI as an important resource for triaging and screening potential candidates for residential care. This assessment tool was created to identify clinical need in the referral population, but presently was also able to delineate different levels of risk and need within the families seeking intensive residential treatment for their children and youth.

Second, the results of this research, combined with the other validation studies for the BCFPI (Boyle et al., 2009; Cunningham et al., 2009), suggest that this tool could have utility as an outcome measure. In addition, there is evidence suggesting that the BCFPI yields favourable response rates compared to other pen-and-paper measures (St. Pierre et al., 2008), making this an important tool for practitioners charged with evaluating the efficacy of their programs.

There are some noteworthy limitations of the current study. These include the fact that this study only investigated the efficacy of the BCFPI at one psychiatric residential agency, over the course of consecutive referrals during a four-year period. It is possible that the results would not hold for different tertiary care facilities at different points in time. Future research will be needed, in order to substantiate the generalizability of these results. In addition, the children and youth in this sample largely present with externalizing problems and problems with social functioning, and generally have anxiety and/or depression symptomatology as a secondary diagnosis. It is, therefore, unknown whether the BCFPI would perform as well in a population with only internalizing problems. Despite these limitations, these findings suggest that the BCFPI is a reliable and valid indicator of reported child functioning within this tertiary care psychiatric population.

Table 4. Factor loadings associated with BCFPI mental health subscale questions

Regulating inattention, impulsivity, and activity level	
Distractible, has trouble sticking to an activity	.728
Jumps from one activity to another	.708
Fails to finish things he starts	.685
Fidgets	.644
Difficulty following directions or instructions	.555
Impulsive, acts without stopping to think	.704
Cooperation with others	
Defiant, talks back to adults	.776
Argues a lot with adults	.848
Angry and resentful	.722
Easily annoyed by others	.588
Cranky	.622
Blames others for own mistakes	.580
Conduct	
Vandalism	.702
Destroys things belonging to others	.748
Uses weapons when fighting	.656
Steals things at home	.556
Physically attacks people	.705
Has broken into a house, building, or car	.259
Separation from parents	
Overly upset when leaving loved ones	.786
Overly upset when away from loved ones	.778
Worries about being separated from loved ones	.762
Scared to sleep without parents nearby	.622
Complains of feeling sick before separating	.612
Worries bad things will happen to loved ones	.650
Managing anxiety	
Worries about doing the wrong thing	.850
Is afraid of making mistakes	.761
Worries about doing better at things	.770
Worries about past behaviour	.683
Is overly anxious to please people	.664
Worries about things in the future	.650
Managing mood	
Unhappy, sad, or depressed	.703
Not as happy as other children	.707
Feels hopeless	.676
Has trouble enjoying self	.822
Gets no pleasure from usual activities	.727
No interest in usual activities	.719

Acknowledgements / Conflicts of Interest

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