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RESEARCH BRIEF

Environmental Risks and Children's Mental Health Treatment Outcomes: A Person-Centered Analysis

Purpose of the Study

The purpose of this study was to (a) determine if there is evidence of post-treatment symptom reduction for a racially-diverse sample of children and adolescents served by a community-based mental health clinic, (b) identify subgroups of children by environmental risk, and (c) determine if there are differences between subgroups on outcome change scores.

Background & Purpose

Recent estimates show that nearly one out of every five children meets criteria for a mental health disorder.

Recent estimates show that nearly one out of every five children meets criteria for a mental health disorder (Merikangas et al., 2010). Many of those children receive mental health treatment at community-based centers. Existing research has produced noteworthy concerns about the effectiveness of community-based children's mental health treatment (Warren, Nelson, Burlingame, & Mondragon, 2012), with some results indicating little to no positive effect of treatment (Weisz, 2004). Given the pervasiveness of children's mental illness and the inconclusiveness of treatment effectiveness, increased research on children's mental health treatment outcomes is necessary. The purpose of this study was to conduct outcome-based research in cooperation with a community-based mental health center to better understand factors (i.e., environmental risks) that contribute to those outcomes.

At the treatment center, outcomes are measured using the Strengths and Difficulties Questionnaire (SDQ), a brief caregiver-report questionnaire to assess children's social, emotional, and behavioral functioning across six domains (i.e., emotions, conduct, hyperactivity, peer relationships, prosocial skills, and overall impact; Goodman et al., 2000). The Total Difficulties score is a composite score combining the areas of emotions, conduct, hyperactivity, and peer relationships. This score was used to measure symptom change over time.

Seven environmental risk indicators (poverty, homelessness, school mobility, out-of-home placement, neglect, physical abuse, and sexual abuse) were utilized to divide children into subgroups. SDQ Total Difficulties scores were used to determine whether changes in symptomology differed across subgroups after mental health treatment.

This study addressed the following research questions:

1. ***Do children who receive mental health treatment show significant symptom reduction on pre- to post-treatment measures?***
2. ***Are there meaningful homogeneous groups of children that can be identified based on environmental risk factors?***
3. ***Do changes in symptomology differ by identified environmental risk subgroups?***

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Methods

Using paired samples t-tests, mean differences between pre- and post-treatment symptomology were examined for a sample of children treated by a community-based mental health center (n = 1,176). Latent class analysis was used to identify groups of children who shared environmental risk, and differences between risk groups on treatment outcomes were compared using a one-way ANCOVA controlling for age, race/ethnicity, and gender.

Findings

Findings revealed significant reduction in symptomology for children at a community-based children's mental health center following treatment. Four environmental risk groups were identified using latent class analysis. These groups did not differ with respect to changes in symptolology following treatment.

A truncated, secondary data set developed through Minn-LInK was utilized for this study. The original data set matched treatment center administrative data (from July 1, 2007 to June 30, 2012) to Minnesota Department of Education data, resulting in a 95% match rate. The data were subsequently matched with other service sector data, including data from the Minnesota Department of Human Services and the State Court Administrator's Office. Children served prior to 2008 were omitted from the dataset because the collection of homelessness data began in 2008. Because the SDQ is validated for children 4-17 years, children outside this age range were also excluded from the sample, resulting in a final sample of 1,176 children.

Significant mean differences between pre- and post-treatment symptomology (i.e., first to last SDQ Total Difficulties scores and high to last SDQ Total Difficulties scores) were assessed using paired samples t-tests. Cohen's *d* was used to determine the magnitude of the treatment effect. Children's experiences of seven binary environmental risk variables were used to identify groups (via Latent Class Analysis [LCA]), and a one-way ANCOVA was conducted to examine differences between groups on final SDQ Total Difficulties scores after controlling for age, race/ethnicity, and gender.

Preliminary analyses were conducted to assess for significant relationships between demographic variables and independent and dependent variables in the study. Statistically significant group differences on baseline SDQ Total Difficulties scores were found for gender, $F(1, 1174) = 32.54$, $p < .001$, and race/ethnicity, $F(4, 1171) = 8.55$, $p < .001$, but not for age (see Supplemental Table A and B). Significant differences were also found by age for each environmental risk variable. Preliminary analyses justified including race/ethnicity, age, and gender as covariates in the analysis for the third research question.

Symptom Reduction

Results revealed that children benefited from being served at the community-based mental health center. Symptom change was measured over time, as assessed by the SDQ Total Difficulties, for both first to last scores and high to last scores. *T*-test measuring mean change over time between first ($M = 18.08$, $SD = 7.12$) and last ($M = 15.25$, $SD = 7.29$) Total Difficulties scores showed significant decreases in scores, $t(1175) = 16.09$, $p < .001$. The effect sized (d=.39) indicated a small to medium effect (Cohen, 1992). The next *t*-test, from highest ($M = 20.38$, $SD = 6.84$) to last ($M = 15.25$, $SD = 7.29$) scores, also showed significant decreases, $t(1175) = 36.23$, $p < .001$. The effect size (d=.72) indicated a medium to large effect (Cohen, 1992). These results provided evidence of a reduction in symptomology for children and supported the notion that children made improvements during treatment. These findings can help to improve confidence in children's mental health treatment and community-based mental health centers.

From these results, there is reason to believe that initial SDQ Total Difficulties scores may not be the truest representation of the child's symptoms... Further research is needed to better understand this phenomenon, but this observation provides justification for future researchers to measure symptom changes using a similar methodological strategy instead of simply using pre- and post-treatment measures.

One noteworthy observation was made during this study. Changes from children's first to last and high to last Total Difficulties scores were measured. Comparisons of high to last Total Difficulties scores were specifically made because of anecdotal reports by clinicians of an increase in children's symptoms after the start of treatment. This study revealed empirical evidence of this occurrence. On average, first scores ($M = 18.08$, $SD = 7.12$) were lower than children's highest scores ($M = 20.38$, $SD = 6.84$). From these results, there is reason to believe that initial SDQ Total Difficulties scores may not be the truest representation of the child's

Table 1

Prevalence and Means (Standard Deviations) for Environmental Risk Class Characteristics

	Total Sample (*N*=1,176)	*Class 1:* **Low-Risk** (*n* = 553; 47.0%)	*Class 2:* **High-Poverty** (*n* = 433; 36.8%)	*Class 3:* **High-Risk** (*n* = 153; 13.0%)	*Class 4:* **Low-Poverty w/ Out-of-home Placement** (*n* = 37; 3.1%)	F /χ^2	*df*	*p*
Age	10.10 (3.24)	10.13 (3.39)	10.37 (3.00)	9.33 (3.06)	9.51 (3.80)	4.39	3	0.004
Gender						2.45	3	0.484
Male	59.4%	41.0%	42.0%	36.6%	32.4%			
Female	40.6%	59.0%	58.0%	63.4%	67.6%			
Race/Ethnicity						298.82	12	<0.001
American Indian/Alaska Native	3.8%	$2.2\%_{a}$	$3.2\%_{a}$	$12.4\%_{b}$	$0.0\%_{a}$			
Asian/Pacific Islander	2.3%	2.7%	2.1%	1.3%	2.7%			
Hispanic	8.1%	$5.6\%_{a}$	$11.1\%_{b}$	$9.2\%_{a, b}$	$5.4\%_{a, b}$			
Black	31.5%	$11.6\%_{a}$	$47.1\%_{b}$	$57.5\%_{c}$	$37.8\%_{b}$			
White	54.3%	$77.9\%_{a}$	$36.5\%_{b}$	$19.6\%_{c}$	$54.1\%_{d}$			
Environmental Risks								
Poverty	47.3%	$0.0\%_{a}$	$98.6\%_{b}$	$84.3\%_{c}$	$0.0\%_{a}$	1,071.08	3	<0.001
Homelessness	5.5%	$0.0\%_{a}$	$9.9\%_{b}$	$14.4\%_{b}$	$0.0\%_{a}$	73.56	3	<0.001
School Mobility	22.8%	$14.6\%_{a}$	$25.6\%_{b}$	$37.3\%_{c}$	$51.4\%_{c}$	58.18	3	<0.001
Out-of-home Placement	15.2%	$0.0\%_{a}$	$8.1\%_{b}$	$76.5\%_{c}$	$73.0\%_{c}$	656.81	3	<0.001
Neglect	13.1%	$1.1\%_{a}$	$0.0\%_{b}$	$93.5\%_{c}$	$13.5\%_{d}$	1,003.72	3	<0.001
Physical Abuse	6.1%	$0.0\%_{a}$	$2.1\%_{b}$	$32.7\%_{c}$	$35.1\%_{c}$	290.32	3	<0.001
Sexual Abuse	3.0%	$0.0\%_{a}$	$1.8\%_{b}$	$17.6\%_{c}$	$0.0\%_{a, b}$	134.05	3	<0.001

Note: Each subscript letter denotes a subset of class categories whose column proportions differ significantly from each other at the p <.05 level .

symptoms. Among other reasons, higher scores could be a result of caregivers feeling more capable of identifying symptoms or feeling more trust in disclosing symptoms to their clinician. Further research is needed to better understand this phenomenon, but this observation provides justification for future researchers to measure symptom changes using a similar methodological strategy instead of simply using pre- and post-treatment measures.

Environmental Risk Groups

Latent class analysis (LCA) was used to address the second research question which sought to identify and define subgroups of children based upon environmental risks. Three fit indices and theory were used to interpret the results (see Supplemental Table C). Four latent classes resulted: *Low-Risk, High-Poverty, High-Risk*, and *Low-Poverty with Out-of-home Placement* (see Table 1).

The four classes can be divided into two groups: poor (classes 2 and 3) and non-poor (classes 1 and 4). Within those groups, distinct differences exist that help to illustrate an important picture. Class 2 was represented by the higher prevalence of poverty and a low prevalence of both maltreatment (i.e., neglect, physical abuse, sexual abuse) and out-of-home placement. Class 3 shared the higher prevalence of poverty, but had a high prevalence of maltreatment and out-of-home placement. Classes 1 and 4 had no poor children. Class 1 had almost no children with maltreatment or out-of-home placement; however, class 4 included children out-of-home placement. When considering the total landscape of the four classes, one can generally see that maltreatment and out-of-home placement exist (and do not exist) for both poor and non-poor children. Poverty, although related to other environmental risks, does not mean children will necessarily experience other environmental risks (class 2). Similarly, having financial resources does not preclude children from experiencing other environmental risks (class 4). The LCA exposed patterns of environmental risks within the sample of children served at the community-based children's mental health center. The risks aggregated based upon their relationship to one another, which allowed for a person-centered look at those risks in the final research question.

Changes in Symptomology by Environmental Risk Groups

An analysis of variance controlling for age, gender, and race/ethnicity (ANCOVA) found no significant differences in symptom changes between environmental risk classes. The ANCOVA revealed non-significant group differences on Total Difficulties change scores for both first to last scores, $F(3, 1166) = 2.08$, $p = .101$, and high to last scores, $F(3, 1166) = 37.51$, $p = .188$. These results provide evidence that there are no statistically different treatment outcomes between the four risk classes when controlling for demographic variables.

Conclusion

This study sought to evaluate symptom reduction for children who received mental health treatment, determine whether environmental risk groups could be identified, and assess whether changes in symptomology differed by identified environmental risk subgroup. Significant reduction of symptomology from first to last SDQ Total Difficulties and high to last SDQ Total Difficulties scores were observed, providing evidence that children benefited from their treatment at the community-based mental health center. LCA fit indices and theoretical constructs conjointly endorsed four groups of environmental risk: *Low-Risk, High-Poverty, High-Risk,* and *Low-Poverty with Out-of-home Placement*. The prevalence of the four groups confirms the existence of risk constellations in children. However, non-significant differences in changes in SDQ Total Difficulties scores were observed between the four classes, which provides evidence for consistent changes in symptomology over the course of treatment regardless of the environmental risks experienced by children.

Limitations

The study did not examine treatment factors such treatment frequency, service intensity, length of treatment, and intervention model that would have likely impacted treatment outcomes. For example, children in the study who received only weekly outpatient services were grouped with those children who received daily day treatment, weekly in-home therapy, and psychiatric services. Their outcomes were not evaluated differently.

The results from this study are valuable to diverse audiences. With the high rates of mental health disorders among America's youth, community-based treatment centers are being used more regularly. Evidence of positive treatment outcomes at community-based children's mental health centers helps build public confidence in the effectiveness of similar treatment facilities.

Mental health centers can benefit from better understanding outcomes of children with distinctive risk profiles. When symptom changes vary by risk classes, service availability and design can be tailored to meet children's needs. Administrators can make efforts to financially support training staff in methods that best serve identified types of children. Relationships with community partners may help meet children's needs when internal services are insufficient.

Finally, by studying treatment outcomes using unique risk groups, interventionists are better able to understand factors that impact treatment and improve intervention strategies. Better understanding of client typologies can help create unique client-centered clinical assessment, treatment planning, and intervention choice. This can include multi-disciplinary strategies that connect children and their families to a broad range of services to meet their distinctive needs.

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