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Depression and Social Functioning Among Preschool Children with Chronic Medical Conditions

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Abstract

Objective—To investigate the relations between depressive symptoms, social behavior, and chronic medical illness in preschool children.

Study design—Caregivers of 273 preschool children (3.0 to 5.2 years of age) completed questionnaires regarding preschoolers' physical health, depressive symptoms, and social behavior. Interviewers determined ratings for preschoolers' impairment in social and behavioral functioning. Analyses examined the relationships between chronic medical conditions, depressive symptoms, peer acceptance/rejection, and social behavior.

Results—Chronic illness was significantly associated with early-onset depressive symptoms and impairment in several social functioning domains, even after accounting for socioeconomic status. Regression analyses demonstrated that the number of health conditions predicted higher depression scores, frequency of asocial behaviors, and impairment in daycare role cooperation and behavior towards others. Preschoolers with at least one medical condition experienced a greater frequency of peer rejection and bullying compared with healthy peers. Depressive symptoms mediated the relationship between illness and asocial behavior.

Conclusions—There is a need for greater attention to depression and difficulties in social functioning in preschool children with chronic illness. Given the potential impact on later developmental and mental health outcomes, primary care physicians should now be attentive to depressive symptoms in chronically ill preschoolers.

Keywords

depression; chronic illness; social functioning; psychosocial factors; preschool; development

The increased risk of major depressive disorder¹ as well as difficulties in social functioning² among adults and older children with a chronic medical condition has been well documented. As many as 4% to 14% of school-aged children exhibit depressive symptoms within 3 months following the diagnosis of a medical illness.^{3–5} Medical conditions that limit physical activities or require frequent absences also have been associated with social problems such as being ignored or teased by peers.^{6,7} Because the psychosocial correlates of chronic medical illness are likely to vary based on the salient socioemotional challenges associated with a

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particular developmental stage,⁸ medical illness may have a unique impact on the critical neurobiological, emotional, social, and cognitive development occurring during the preschool period between 3 and 6 years of age.^{9,10} Preschoolers are on a steep developmental trajectory as evidenced by major shifts in capacity for reciprocal play, conflict resolution, and maintenance of emotional regulation and self esteem.^{11,12} Recent studies show that depressive syndromes and symptoms including sadness, irritability, anhedonia, whining, crying, and self-blame can be identified in children as young as 3 years old.¹³ Thus, we sought to investigate the psychosocial repercussions of chronic medical problems even among very young preschool-aged children.

We hypothesized that preschool children with one or more chronic medical conditions would demonstrate more depressive symptoms as well as greater difficulty in social interactions than preschoolers without chronic health problems. Further, it was expected that the interaction between having at least one health condition and high rates of depressive symptoms would have a significant negative impact on preschoolers' social relationships.

Methods

Participants

Parent and child dyads were recruited for participation in a 3–4 hour laboratory assessment as part of a larger study on the nosology of preschool depression conducted in the Early Emotional Development Program at the Washington University School of Medicine. To achieve ethnic and socioeconomic diversity, nearly 6000 families of preschoolers (3.0 and 5.6 years) were recruited from daycare facilities, preschools, and primary care settings randomly selected using the geographic stratification method. Caregivers completed the Preschool Feelings Checklist (PFC), a 16-item screening checklist that has identified children at risk for mood and/or disruptive disorders.¹⁴ A cut-off score of ≥ 3 has been shown to maintain high sensitivity (.92) and specificity (.84) for the diagnosis of depression.¹⁴ Children with three or more depressive/disruptive symptoms or zero endorsed symptoms (presumed healthy) were sought for participation to capture a high proportion of children with depression and other symptoms as well as healthy children.

The sites collected and returned 1474 completed checklists. Among returned checklists, 240 had PFC scores out of the desired range and 335 were ineligible due to being out of the age range. The remaining 899 children that met all initial screening and inclusion criteria were contacted by phone for further screening. Individuals with marked speech and language delays, neurologic or developmental disorders, Autistic Spectrum Disorders, or an IQ below 70 were excluded. Preschoolers with severe chronic medical conditions, such as, cystic fibrosis, diabetes, HIV/AIDS, or cancer were also excluded. Preschoolers without exclusions (N=416) were invited for participation in the study; 305 agreed and presented for the assessment.

Measures

Each preschooler's parent or guardian filled out the MacArthur Health and Behavior Questionnaire-Parent Version (HBQ 1.0), a measure of physical and social well-being for young children.¹⁵ A dimensional rating of depression for each child was derived from the mean of seven depression-specific items (based on a 3-point Likert scale) on the Mental Health Scale's internalizing subscale. High scores on these dimensional symptom ratings are consistent with DSM-IV diagnostic criteria for pediatric depression.¹³

Social functioning was determined from the Peer Relations scale of the HBQ, derived from the means of the eight items on the Peer Acceptance/Rejection subscale on whether peers are inclusive or rejecting towards the child, as well as the three items on the Bullied by Peers

subscale to detect bullying by other students. Further, the HBQ Social Withdrawal scale score was assessed from the mean of the Social Inhibition subscale's three questions on the shyness around other people, and the Asocial Behavior subscale's three items on a child's preference of being alone or with peers.

Physical functioning was determined from the Global Physical Health and Chronic Medical Conditions subscales. Parents rated their child's general health from "excellent" to "poor" as well as how negatively a child's health problems impacted his or her daily functioning. Parents also responded "yes" or "no" to whether their child had "ever had" any of 17 chronic medical conditions (e.g. asthma, bowel diseases). Medical conditions were designated based on parental interpretation of the language utilized in the HBQ, such that frequently recurring infectious diseases (e.g. urinary tract and ear infections) were defined as "repeated persistent" diseases. Disorders of hearing, vision, learning, and speech were not included in analyses of chronic medical conditions.

Moreover, all preschoolers were evaluated with the Preschool and Early Childhood Functional Assessment Scale (PECFAS), an interviewer-rated measure with favorable psychometric properties, such as subscale internal consistency ($\alpha=.86$), that assesses the psychosocial functioning and impairment of children between the ages of 3.0–7.1.¹⁶ All interviewers were certified in PECFAS administration and coding that previously have demonstrated excellent inter-rater reliability ($r=.90$).¹⁶ Because medical conditions were recorded by the parent on a separate instrument (HBQ), and the PECFAS was rated by parent interviewers who did not have contact with the child, PECFAS raters remained blind to children's health status.

Findings were analyzed from the Daycare/Preschool Role Performance subscale, which addresses how effectively the child fulfills societal defined roles in learning, paying attention, obeying rules, and behaving in a group setting. The ratings on the Behavior Towards Others subscale were also included in analyses to assess whether a child engaged in inappropriate behavior such as temper tantrums, starting fights, pouting, teasing, or avoiding interaction with peers. The degrees of impairment were assigned a score of 30 (severe impairment), 20 (moderate impairment), 10 (mild impairment), or 0 (no impairment) based on the specific items endorsed.

Results

Participant Demographics

The sample was comprised of 273 preschoolers with a mean age of 4.02 years who came from diverse racial/ethnic and socioeconomic backgrounds (Table I). Although 305 preschoolers met the inclusion criteria and were assessed, 32 participants were excluded from analyses due to missing data on demographics or the measures of social functioning. Approximately 94% of persons who provided information for the preschoolers were biological mothers.

Nearly two-thirds of the sample (61.6%, $N=168$) reported having at least one pediatric medical condition, such as asthma (Table I). Further, 29.7% ($N=82$) of caregivers reported that their children were at least "a little" distressed by illness within the last six months. The ability to engage in desired activities was at least "a little" limited by a medical condition for 12.7% ($N=35$) of the sample. Given that the majority of conditions reported were not "serious," an additive effect of illness was assumed and the number of chronic conditions was utilized as a variable for subsequent analyses. Preschoolers with at least one medical condition ($N=162$) stayed home from daycare significantly more days than their healthy counterparts ($N=101$), $t(249)=-3.561, p=.001$.

Correlation Analyses

The expected positive associations were found between the medical health, depressive symptoms, and aspects of social functioning (Table II and Table III). The family's income was significantly related to the number of illnesses reported ($r = -.225, p = .001$), such that preschoolers from lower socioeconomic status had a greater number of medical problems.

Relationship between chronic health conditions and depressive symptoms

Regression analyses showed that the number of pediatric medical conditions reported for the child significantly predicted the mean scores on the depression-specific subscale of the HBQ (Table IV). To control for the effects of socioeconomic status, preschoolers for whom such data were available were categorized based upon illness: no medical conditions ($N=93$), one medical condition ($N=75$), or two or more medical conditions ($N=86$), and income was used as a covariate. ANCOVA indicated a significant effect of illness on depressive symptoms after controlling for preschoolers' income, $F(2,241)=4.569, p=.011$. An independent samples t -test comparing the depressive symptoms for children with at least one health condition ($N=161$) and children with no health conditions ($N=100$) showed a significant effect for illness, $t(259) = -3.477, p=.001$.

Relationship between chronic health conditions and social functioning

Regression analyses indicated that the number of chronic illnesses significantly predicted the frequency of asocial behavior and explained a significant proportion of the variance, $R^2 = .021, F(1,255)=5.528, p=.019$ (Table IV). Using preschoolers' illness category as an independent variable and income as a covariate, ANCOVA indicated that the effect of illness on asocial behavior was no longer significant. However, including income as a covariate revealed a significant effect of illness on peer acceptance/rejection, $F(2,244)=5.409, p=.005$. Independent samples t -tests showed significant differences between children with at least one medical condition and children with no health problems on peer acceptance/rejection, $t(256) = 2.699, p=.007$ and on the frequency of being bullied by peers, $t(248) = -2.367, p=.019$.

Results from interviewer ratings of social functioning on the PECFAS were consistent with findings from the parental-rated HBQ. The number of chronic medical problems was significantly associated with increased impairment in daycare role performance $R^2 = .039, F(1,248)=9.943, p=.002$ as well as behavior-towards-others impairment scores, $R^2 = .064, F(1,260)= 17.877, p=.001$ (Table IV). After accounting for the effects of income using ANCOVA, there was still a significant impact of preschoolers' illness categorization on impairment in daycare role performance, $F(2,232)=4.442, p=.013$ and behavior towards others, $F(2,242)=7.341, p=.001$. Independent samples t -tests indicated a significant difference between preschoolers with at least one medical condition and healthier preschoolers in the degree of impairment in daycare role performance $t(247) = -3.635, p=.001$ and behavior towards others, $t(260) = -3.897, p=.001$.

Health conditions and depressive symptoms in relation to preschoolers' social functioning

A MANCOVA using social functioning factors as dependent variables, illness categorization (no medical conditions, $N=94$; one condition, $N=68$; two or more conditions, $N=84$) as an independent variable, and depressive symptoms as a covariate showed no significant interactive effects. The possibility of depressive symptoms as a mediator in the relationship between illness and social functioning was tested using hierarchical multiple regression as outlined by Kraemer et al (2001)¹⁷ (Table IV). Because most medical conditions were present at birth (e.g. asthma), illness was assumed to predate the occurrence of depressive symptoms. Regression analyses indicated significant effects of depressive symptoms on nearly every variable of social functioning: peer acceptance/rejection, $F(1,267)=86.419, p=.001$; bullied by

peers $F(1267)=78.593, p=.001$; asocial with peers $F(1261)=72.188, p=.001$; social inhibition $F(1267)=7.384, p=.007$; daycare role performance $F(1252)=11.742, p=.001$; and behavior towards others $F(1264)=39.951, p=.001$. After adding depressive symptoms to the regression model, the relationships between the number of illnesses and daycare role performance $F(2243)=7.951, p=.024, \Delta R^2=.025$, as well as between illnesses and behavior towards others $F(2255)=22.620, p=.004, \Delta R^2=.087$, remained significant. However, the relationship between illness and asocial behavior was no longer statistically significant after accounting for depressive symptoms.

Discussion

Current findings indicated that even as early as the preschool period, significant associations between chronic medical conditions, depressive symptoms, and impairments in psychosocial functioning were evident. Preschoolers with at least one chronic medical condition or poor overall physical health, regardless of socioeconomic background, were at higher risk of experiencing depressive symptoms than were their healthy counterparts. The expected significant association between health and emotional distress underscores the importance of examining these relationships at specific as well as very early stages of development. Aspects of the illness experience may be uniquely relevant to very young children, especially since many preschoolers suffered distress related to their health conditions. Whereas older individuals' depressive symptoms such as grief, anxiety, and self-blame may arise from their perception or awareness of the illness burden,¹⁸ such as changes in independence¹⁹ and self-concept³, preschoolers cognitively may not grasp the implications of having a chronic illness in the same way. Future research should directly examine facets of illness that are troubling to young children, and how their perception of illness relates to self-concept as well as other psychological issues.

Both parental and interviewer ratings indicated that chronic illness was related to how a preschooler interacted with peers, his or her fulfillment of societally defined roles in daycare, and how peers responded to the child. Preschoolers with medical problems were more likely to display inappropriate, disruptive, or disobedient behavior at daycare such as temper tantrums, teasing, starting fights, and being overly withdrawn. Likewise, having a greater number of medical conditions was associated with a higher frequency of being rejected, teased, and/or bullied by other children. Because preschoolers with at least one condition were absent from daycare more frequently than healthier children, a medically ill preschooler may not have adequate opportunities to develop the social skills needed to achieve acceptance rather than rejection from peers.¹² After controlling for income, illness no longer significantly impacted the frequency of avoiding peers, but a significant impact of illness on peer acceptance or rejection persisted. Additional research may clarify how environmental and socioeconomic factors influence the effects of medical illness on meeting social developmental challenges.

Most prior research indicates that conditions that affect a child's appearance or visibly limit physical activities are more associated with problems in peer relationships.^{7,20} Most medical conditions arising in this sample, such as asthma, were not visually apparent. A study of school-aged children with diabetes suggested that impairment in social functioning may be more "forgivable" when illness is accepted as an external reason for negative social behavior.²¹ This phenomenon may be salient, especially for preschool-aged children, as peers also may have less capacity to understand the implications of illness and may not integrate the preschooler's illness into his or her social identity. This issue is worthy of specific developmental study, as chronic illness may delay or alter the developmental trajectory of integrating information to form social acceptance judgments.

Most findings from this study were expected because childhood chronic illness is a known stress that affects children and families' well-being in physical, emotional, social, and functional domains.²² Although no significant interactions between illness and depression were detected on social functioning, it is important to note that depressive symptoms mediated the association between chronic illness and asocial behavior. The loss of enjoyment in play, another symptom characteristic of depressed preschoolers,¹⁴ may prevent a young child, especially if he or she is suffering from illness, from interacting with peers. In contrast, disturbances in peer relationships, such as being bullied by other children, may increase depressive symptoms over time. These findings are concordant with research that has identified psychosocial risk factors for developmental psychopathology in normative samples^{23,24} and add to the growing body of literature demonstrating the importance of aspects of the psychosocial environment as both risk and protective factors very early in development.^{9,25}

The generalizeability of this study's findings to a general population of preschool children may be limited because the sample was stratified to include children with higher rates of depressive symptoms. Results may differ for preschoolers who meet full criteria for early-onset major depression rather than subsyndromal depressive symptoms. The sample size did not allow us to determine the differential impact of various illnesses on psychosocial functioning, nor did the sample include preschoolers with "visible" or more severe diseases that can shorten life expectancy, such as cystic fibrosis and cancer. Moreover, the designation of some medical illnesses as "persistent" (e.g. "persistent ear infections") was based on parental discretion and report, rather than a specific number of episodes in a concrete time frame or on medical records. Future studies should employ longitudinal designs to explore changes in the relationships between chronic illness, depressive symptoms, and social functioning among an ethnically and medically diverse sample of young children.

This study addresses depressive symptoms and social functioning among a sample of preschool children with chronic illness. The findings are clinically important for primary care physicians as they highlight the importance of considering the emotional and social effects of chronic illness at early and critical stages of development. Moreover, poor peer relationships in childhood might predict longer-term problems in psychological adjustment,^{26,27} so addressing both the physical and psychosocial concerns of a medically ill preschooler has the potential for a positive impact on later mental and developmental outcomes.

Psychosocial prevention and intervention strategies for early-onset depressive symptoms should be specifically and developmentally tailored to preschool children with chronic illness, as aspects of illness that contribute to depressive symptoms for very young children may differ from those observed in older children and adults. The convergent validity between parent and interviewer reports suggests that clinicians and daycare workers may be able to observe difficulties interacting with peers, which may be a crucial indication that a preschooler is having trouble adjusting to illness.²⁸ Increased assessment, recognition, and interventions addressing the deleterious effects of chronic medical problems even on very young children are warranted.

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Table I

Demographic characteristics of study subjects

Variable *	N	%
Sex: Male	140	52.2
Female	128	47.8
Age (yrs): 3	72	26.7
4	120	44.3
5	79	28.2
Race: Caucasian	150	55.1
African American	86	31.6
Biracial	31	11.4
Latino/Hispanic	2	0.7
Other	3	1.1
Income: \$0–20,000	61	23.8
\$20 001–40 000	40	15.6
\$40 001–60 000	44	17.2
\$60 000 and above	103	40.2
Chronic Medical Conditions		
Repeated persistent ear infections	79	28.9
Repeated persistent respiratory infections	71	26.0
Asthma	63	23.1
Bowel diseases	20	7.3
Repeated persistent urinary infections	10	3.7
Blood diseases	8	2.9
Chronic/recurrent lung disease	4	1.5
Eczema	2	0.7
Birth Defect(s)	1	0.4
Congenital heart disease	1	0.4
Hepatitis A	1	0.4
Other	6	2.2

* Individuals could report more than one medical condition, making numbers in this table not always add up to those reported in the text or may differ based upon the analysis reported.

Table II

Depressive symptoms and social functioning of study subjects

Variable	N tested	Mean (SD)
Depressive symptoms	269	0.311 (.305)
Peer Relations	273	2.487 (.247)
Peer acceptance/rejection	273	3.457 (.542)
Bullied by peers	273	1.517 (.662)
Social withdrawal	265	0.661 (.382)
Social inhibition	273	0.876 (.552)
Asocial behavior	265	0.446 (.398)
Daycare/preschool role performance	258	4.340 (8.070)
Behavior-towards-others score	270	8.480 (8.106)

Table III
Pearson Correlations between Physical Health, Depression, and Social Functioning

	Sum of Chronic Conditions						
	1	2	3	4	5	6	7
Physical health concerns	.430**						
Depressive symptoms	.231**	.228**					
Peer acceptance	-.092	-.248**	-.494**				
Asocial behavior	.146*	.152*	.465**	-.446**			
Social withdrawal	.087	.096	.372**	-.234**	.721**		
Disruptive daycare behavior	.196**	.111	.211**	-.288**	.156*	-.056	
Inappropriate social behavior	.254**	.229**	.363**	-.378**	.308**	.157*	-.503**

* p<.05

** p<.01

Table IV**Linear Regression Analyses of Physical Health, Depression, and Social Functioning**

	B(SE)	β	t^a	p
Chronic medical conditions predicting depressive symptoms	.065(.015)	.253	4.232	.001
Chronic medical conditions predicting social functioning				
Asocial with peers	.049(.021)	.146	2.351	.019
Daycare role impairment	1.318(.418)	.196	3.153	.002
Behavior towards others impairment	1.712(.405)	.254	4.228	.001
Depressive symptoms predicting social functioning				
Peer acceptance/rejection	-.883(.095)	-.494	-9.926	.001
Bullied by peers	1.039(.117)	.477	8.865	.001
Asocial with peers	.607(.071)	.465	8.496	.001
Social inhibition	.298(.110)	.164	2.717	.007
Daycare role impairment	5.578(1.628)	.211	3.427	.001
Behavior towards others impairment	9.626(1.523)	.363	6.321	.001
Chronic illness and depressive symptoms predicting social functioning				
Daycare role impairment	.986(.436)	.146	2.264	.024
Behavior-towards-others impairment	1.170(.406)	.172	2.882	.004

^a *t* tests are two-tailed.

Abbreviations: B, unstandardized beta regression coefficient; SE, standard error; β, standardized beta regression coefficient.