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Original article

Preventive Child Health Care Findings on Early Childhood Predict Peer-Group Social Status in Early Adolescence

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ABSTRACT

Purpose: A disputed social status among peers puts children and adolescents at risk for developing a wide range of problems, such as being bullied. However, there is a lack of knowledge about which early predictors could be used to identify (young) adolescents at risk for a disputed social status. The aim of this study was to assess whether preventive child health care (PCH) findings on early childhood predict neglected and rejected status in early adolescence in a large longitudinal community-based sample.

Methods: Data came from 898 participants who participated in TRAILS, a longitudinal study. Information on early childhood factors was extracted from the charts of routine PCH visits registered between infancy and age of 4 years. To assess social status, peer nominations were used at age of 10–12 years.

Results: Multinomial logistic regression showed that children who had a low birth weight, motor problems, and sleep problems; children of parents with a low educational level (odds ratios [ORs] between 1.71 and 2.90); and those with fewer attention hyperactivity problems (ORs = .43) were more likely to have a neglected status in early adolescence. Boys, children of parents with a low educational level, and children with early externalizing problems were more likely to have a rejected status in early adolescence (ORs between 1.69 and 2.56).

Conclusions: PCH findings on early childhood—on motor and social development—are predictive of a neglected and a rejected status in early adolescence. PCH is a good setting to monitor risk factors that predict the social status of young adolescents.

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IMPLICATIONS AND CONTRIBUTION

Children and adolescents with a disputed social status among peers are at risk for several problems, including being bullied. However, evidence on the joint effects of early risk factors for a disputed social status is limited.

PCH professionals' findings on early development and early social behavior are useful to predict a neglected and rejected status in early adolescence.

Having a disputed social status among peers puts children at risk for a wide range of subsequent problems, including being bullied [1–3], mental health problems [4–7], academic difficulties, or school dropout [5,6,8,9]. During kindergarten and primary school, relations with peers become increasingly impor-

tant for the social and mental development of children. Social status refers to a rank or position that one holds in a group, such as a school class. A disputed social status is defined as having a low social status in such a group. For disputed social status, usually two types are distinguished: rejected and neglected children [10,11]. Both groups score low on peer acceptance. The difference between the two groups is their level of peer rejection. Rejected children are disliked by their peers. Neglected children score low on peer rejection; they are scarcely noticed by their peers. Given the negative consequences of having a neglected or

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rejected status, it is important to identify which factors precede this disputed social status.

It has been shown that sociodemographic and psychological factors can predict a neglected and a rejected status. Evidence shows that belonging to a family with a low socioeconomic status is predictive for a disputed social status [12,13]. Being aggressive [13,14], hyperactive, or less social and having poorer academic performance in elementary school are also predictors [12,13]. Other studies focused on the impact of early temperament on a disputed social status in kindergarten and early elementary school [15–17]. Less is known about the potential role of developmental delays such as motor or language problems [18]. Determinants of developmental delay, such as a low birth weight, may also be associated with a disputed social status; so far, however, no studies have looked into this. Evidence on the joint effect of early risk factors for a disputed social status is limited. The aforementioned early risk factors are factors that are distinctive and noticed by the social environment, especially among peers.

So far, several effective interventions for acquiring better social skills and building friendships and self-esteem have been developed [19–21]. Identification of children and adolescents at risk for a disputed social status could lead to earlier interventions designed to improve social skills, social acceptance, and self-esteem, as well as to prevent the negative outcomes associated with having a neglected or rejected status. This can be achieved by measuring a range of potential risk factors from multiple domains and by starting before peer relationships are well established. These factors are routinely assessed in preventive child health care (PCH) during well-child visits.

The aim of the present study is to assess whether PCH findings on early childhood predict social status in early adolescence in a large longitudinal community-based sample. This study is the first to use a wide range of early childhood factors found in routine PCH measurements to predict neglect and rejection by peers in such a sample. In The Netherlands, PCH provides health and developmental monitoring to all Dutch children from birth until the age of 19 years, and the participation rate is >90% [22]. Dutch PCH professionals are highly trained and experienced in registering those child and family characteristics that are relevant for current and future development.

Methods

Sample

The TRAILS is a prospective cohort study among Dutch adolescents, beginning at 10–12 years of age, that focuses on adolescent psychosocial development and mental health in the general population [23,24]. The TRAILS target sample was recruited in 2001 from elementary schools in five municipalities in the northern part of The Netherlands. Of all the young adolescents approached for enrollment in the study ($n = 3,145$), 6.7% were excluded because of mental or physical incapability or if no Dutch-speaking parent or parent surrogate was available. Seventy-six percent of the remaining 2,935 young adolescents ($n = 2,230$, mean age = 11.1 years, standard deviation [SD] = .6, 50.8% girls), and their parents agreed to participate. For detailed descriptions of sample selection procedures and nonresponse analyses, see De Winter et al [24].

The present study consists of a subsample of 898 of the 2,230 TRAILS participants (mean age = 11.0 years, SD = .51), for whom

both information on social status and PCH files were available. Information on social status was supplied by peers. These peer nominations, which were essential to our study, were only assessed in classrooms with at least 10 TRAILS participants. The subsample of 898 young adolescents differed from the other TRAILS participants mainly as to the type of education; young adolescents in special education were not included (5.6% of the sample). Young adolescents in small schools (6.4%) or those who repeated (16.9%) or skipped (2.2%) a grade were excluded from the subsample, leading to the exclusion of schools for special education. For a detailed description, see Veenstra et al [25]. Where possible, pupils with special educational needs are placed in mainstream schools and given extra assistance. They are only placed in special schools if it is unavoidable and preferably on a temporary basis. In 2004, 94.8% of pupils attended mainstream schools, 3.1% attended special schools for primary education, and 2.1% attended a special school for specific needs, for example, visually or hearing-impaired children [26]. All procedures were approved by the Dutch Central Committee on Research Involving Human Subjects (“CCMO”).

PCH setting

The aim of the PCH is prevention and early identification through a semistructured interview with parents and standardized screening procedures, all of which are documented in the PCH file. An assessment generally takes 10–15 minutes. During children’s first 4 years, community physicians and nurses record data on early childhood indicators at each visit as part of the routine procedure of the PCH, with a total number of 12 visits.

The outcome measurement: social status

Social status was assessed with peer nominations at age of 10–12 years. Young adolescents received a list of all classmates and were asked to answer the following questions: “Who do you like?” and “Who do you dislike?” Young adolescents could make an unlimited number of nominations. On the basis of the received like and dislike nominations, two sociometric variables were computed: social preference and social impact. Social preference was calculated by subtracting the standardized dislike score from the standardized like score. Social impact was calculated by adding the standardized like score and the standardized dislike score [6]. For this article, we focused on the adolescents who were classified as (a) rejected—low on social preference (< -1 SD), above average on (> 0 SD) dislike, and below average on (< 0 SD) like; or (b) neglected—low on social impact (< -1 SD) and below average on both dislike and like (< 0 SD), versus the other young adolescents (i.e., popular, average, and controversial) [6]. The controversial adolescents are included among the popular and average adolescents because they are liked and accepted by part of their group and hence are not in the same disputed social position.

PCH-assessed early childhood indicators

As potential indicators, we selected PCH-assessed prenatal and perinatal variables, as well as early motor and social development and family characteristics.

Prenatal and perinatal variables. Maternal smoking and alcohol use were assessed as “Did the mother smoke during pregnancy?”

and “Did the mother use alcohol during pregnancy?” Maternal smoking and alcohol use during pregnancy were two variables that were frequently missing in the PCH files (58.6% and 60.4%, respectively). In a previous study, Jaspers et al [27] observed good recall for maternal smoking comparing the PCH file data and parental reports at child age of 11 years ($\kappa = .77$). Item nonresponse for the latter variables was much lower; these were used if PCH-recorded data on maternal smoking or alcohol use were lacking. Low birth weight was defined as $<2,500$ g, which is a frequently used clinical cutoff point [28]. Birth defects included limb deformities and craniofacial malformations. Respondents received a “yes” if any of these were present and a “no” if none were present.

Early motor and social development. Early motor and social development, from birth to 4 years of age, was assessed by four indices. The first was the Van Wiechen Scheme, from the age of 1 month to 15 months, which is the Dutch equivalent of the Bayley Scales [29]. Indicators were divided into three different subcategories—gross motor skills (16 items), fine motor skills and adaptation (11 items), and communication and social behavior (10 items)—each targeted at children of a certain age. Items within these three subcategories were summed to provide subscales.

Second, the PCH professional assessed (also based on parental reports) motor and language development six times, from the age of 18 months to 4 years, and reported as either “yes,” in case of a problem, or “no.” Motor and language skills were each added up, respectively, and then dichotomized to a “yes,” if any problems were present during these six occasions, or to a “no.”

Third, from the age of 18 months to 4 years, the PCH professional assessed the development of sleeping and eating behavior six times. Descriptions of this behavior were categorized as “yes,” in case of problems, or “no.” The responses to this behavior were added up and then dichotomized to a “yes,” if any problems were present, and a “no,” if none were present.

Fourth, PCH assessed a number of behavioral features that were recorded on six occasions between the ages of 18 months and 4 years. These behavioral features were collected from three open questions concerning playing, problem behavior, and social behavior, about which parents could provide one or more descriptions. Descriptions included, for example, overactive, shy, anxious, or aggressive [27]. PCH-registered descriptions were categorized as externalizing problems, internalizing problems, attention hyperactivity problems, or social problems in behavior, and then dichotomized to a “yes” if any of these were present during these six occasions, or to a “no” if none were present.

Family characteristics. Maternal age at the birth of the child (mean = 29.4 years, SD = 4.5 years) was dichotomized to contrast young mothers (aged 20 years and younger) with older mothers. We distinguished three groups for educational level of parents: low (at the lowest tracks of secondary education, i.e., lower vocational education and lower general secondary education), middle (higher tracks of secondary education, i.e., intermediate general secondary education, preacademic education, and medium vocational education), and high (higher vocational or university degree) educational level. The highest level of education of one of the parents was taken as the educational level of the parents. Structural family characteristics consisted of two groups: living with both biological parents versus living with divorced parents, with stepparent(s), or in single-parent households.

Statistical analysis

First, descriptive statistics were calculated for social status and early childhood indicators. Second, to assess the longitudinal relationship between early childhood indicators and current social status, multinomial logistic regression analysis was used. The multinomial logistic model (MNL) can be used to examine the effects of independent variables on multicategory dependent variables, referring, in this case, to neglected, rejected, and other young adolescents. With three outcomes, the MNL is roughly equivalent to running three binary logistic regressions. In the MNL, all the logits are estimated simultaneously, which enforces the logical relationship among the parameters and uses the data more efficiently [30]. If the χ^2 tests showed statistically significant ($p < .10$) differences among the three groups, then we assessed the crude effect of each variable separately on the outcomes. Next, we assessed the multivariate (mutually adjusted) effects of all variables that attributed univariately with statistical significance ($p < .10$).

Results

Table 1 shows the differences between neglected, rejected, and other adolescents for PCH-registered prenatal and perinatal factors, early motor and social development factors, and family characteristics. Of the 898 adolescents, 13.8% were in the neglected group, and 12.1% were in the rejected group. In comparison with the other adolescents (i.e., average, controversial, and popular adolescents), during early childhood, neglected adolescents more often had a low birth weight, motor problems, sleep problems, attention hyperactivity problems, and parents with a lower level of education ($p < .10$). Adolescents in the rejected group were more often boys, had more communication delays (aged 1–15 months), and showed more externalizing and attention hyperactivity problems. Furthermore, they more often had young mothers, mothers who smoked during pregnancy, and parents with a lower level of education (p values, all $< .10$). Compared with the other adolescents, they had less often mothers who used alcohol during pregnancy, and they came less often from intact families (p values, all $< .10$).

Table 2 gives multivariate ORs (and 95% confidence intervals) for PCH predictors for having a neglected or rejected status at the age of 11 years. Low birth weight, early motor problems, early sleep problems, attention hyperactivity problems, and low level of parental education were identified as significant independent predictors of a neglected status (ORs between .43 and 2.90) in the multinomial logistic regression model. Gender (being a boy) did not contribute to the model as an independent predictor. For a rejected status, being a boy, early externalizing problems, and a low level of parental education were predictors (ORs between 1.69 and 2.56). Maternal smoking and alcohol use during pregnancy, maternal age <21 years at the birth of the child, early communication delays, early attention hyperactivity problems, and family breakup did not significantly contribute to the model as independent predictors.

Discussion

This study was the first to assess the effects of PCH findings on early childhood in terms of having a disputed social status later on in early adolescence, using a large longitudinal community-based sample. We identified several early childhood indicators

Table 1
Background and developmental features of young adolescents at ages 10–12 years by social status

Variable	Total N (%)	Neglected (13.8%)	Rejected (12.1%)	Others (74.1%)	p
Gender (boy)	398 (44.3%)	34.7%	63.3%	43.0%	***
Prenatal and perinatal factors					
Maternal alcohol use during pregnancy	115 (13.0%)	9.9%	5.6%	14.9%	*
Maternal smoking during pregnancy	257 (28.9%)	29.3%	37.4%	27.5%	*
Low birth weight (<2,500 g)	39 (4.3%)	8.1%	5.5%	3.5%	*
Born premature (<37 weeks)	35 (3.9%)	5.6%	4.6%	3.5%	
Birth defects	17 (1.9%)	.8%	3.7%	1.8%	
Early motor and social development					
Gross motor skills delay (age: 1–15 months)	158 (17.6%)	19.4%	12.0%	18.2%	
Fine motor skills delay (age: 1–15 months)	60 (6.7%)	8.9%	7.4%	6.2%	
Communication delay (age: 1–15 months)	50 (5.6%)	7.3%	7.4%	5.0%	*
Motor problems (age: 1.5–4 years)	30 (3.3%)	7.3%	2.8%	2.7%	*
Language and speech problems (age: 1.5–4 years)	54 (6.0%)	7.3%	8.3%	5.4%	
Sleep problems (age: 1.5–4 years)	211 (23.5%)	31.5%	19.3%	22.7%	*
Problems with eating (age: 1.5–4 years)	451 (50.2%)	46.8%	48.6%	51.1%	
Externalizing problems (age: 1.5–4 years)	340 (37.9%)	34.7%	52.2%	35.9%	**
Internalizing problems (age: 1.5–4 years)	145 (16.1%)	22.6%	11.9%	15.6%	
Social problems in behavior (age: 1.5–4 years)	56 (6.2%)	4.0%	6.4%	6.6%	
Attention hyperactivity problems (age: 1.5–4 years)	324 (36.1%)	21.8%	48.6%	36.7%	***
Family characteristics					
Low educational level of parents	198 (22.0%)	28.7%	32.7%	19.5%	*
Structural family characteristics	167 (18.6%)	15.3%	26.6%	17.9%	*
Mother aged <21 years at time of child's birth	28 (3.1%)	5.0%	6.9%	2.3%	*

N = 898.

*** $p < .001$, ** $p < .01$, * $p < .10$ (two-tailed) χ^2 tests.

that predicted neglect and rejection by peers. Children having a low birth weight, early motor problems, early sleep problems, and parents with a low educational level were more likely to have a neglected status; children with early attention hyperactivity problems were less likely to be so. Boys, children of parents with a low educational level, and children with externalizing problems in toddlerhood were more likely to have a rejected status in early adolescence.

Our study shows that PCH findings on sociodemographic, developmental, and psychological aspects are important for predicting a disputed social status in early adolescence. First, having parents with a low educational level is predictive for both being rejected and neglected, which is in line with previous studies that found that a low socioeconomic status of the family predicted rejection [13,31]. However, these previous studies did not

provide information as to its association with a neglected status. Second, our study shows that a low parental educational level, a low birth weight, and early motor problems also independently predict a neglected status.

Third, we found in our study that toddlers who showed impulsive, hyperactive, and disruptive behavior had a lower chance of neglect later in life. Cross-sectional studies found that neglected children and adolescents were less aggressive and disruptive [11]. Because of their lack of social behavior, most likely they are less visible in groups, putting them at risk of being ignored by their peers. Surprisingly, having early attention hyperactivity problems is not predictive for a rejected status at the age of 11 years, whereas Brendgen and colleagues [12] found that children with a disputed social status were more hyperactive from kindergarten through the age of 12 years.

Table 2
Univariate and multivariate multinomial logistic regression on social status for young adolescents at ages 10–12 years: OR (and 95% CI)

Variable	Neglected (13.8%)		Rejected (12.1%)		Others (74.1%)
	OR (crude) (95% CI)	OR (adj ^a) (95% CI)	OR (crude) (95% CI)	OR (adj ^a) (95% CI)	
Gender (boy)	.70 (.47–1.05)	.80 (.53–1.21)	2.29 (1.50–3.47)	2.05 (1.32–3.17)	1
Maternal alcohol use during pregnancy	.56 (.29–1.08)	—	.34 (.14–.79)	—	1
Maternal smoking during pregnancy	1.09 (.72–1.67)	—	1.58 (1.03–2.42)	—	1
Low birth weight (<2,500 g)	2.45 (1.14–5.28)	2.59 (1.16–5.75)	1.63 (.65–4.09)	1.83 (.66–5.06)	1
Communication delay (age 1–15 months)	1.50 (.70–3.22)	—	1.53 (.69–3.41)	—	1
Motor problems (age: 1.5–4 years)	2.81 (1.23–6.42)	2.90 (1.24–6.77)	1.02 (.30–3.51)	1.19 (.33–4.23)	1
Sleep problems (age: 1.5–4 years)	1.56 (1.03–2.39)	1.71 (1.09–2.68)	.81 (.49–1.35)	.67 (.39–1.15)	1
Attention hyperactivity problems (age: 1.5–4 years)	.48 (.31–.76)	.43 (.26–.69)	1.63 (1.09–2.45)	1.43 (.93–2.20)	1
Externalizing problems (age: 1.5–4 years)	.95 (.63–1.42)	.95 (.62–1.45)	2.03 (1.35–3.05)	1.69 (1.10–2.62)	1
Low educational level of parents	1.99 (1.19–3.33)	2.14 (1.26–3.62)	2.71 (1.55–4.73)	2.56 (1.45–4.52)	1
Structural family characteristics	.83 (.49–1.41)	—	1.66 (1.04–2.66)	—	1
Mother aged <21 years at time of child's birth	2.22 (.85–5.85)	—	3.12 (1.24–7.85)	—	1

Bold values indicate statistical significance.

^a Adj = adjusted for all other variables that are included in the multivariate model; OR = odds ratio; CI = confidence interval.

Furthermore, PCH-identified early internalizing problems were not predictive of either social status, not even in our univariate analyses. This is surprising, given that many studies have shown that socially withdrawn children are often rejected by their peers [32]. Either poor early identification of internalizing problems [33] or discontinuity in this type of problem might explain this; further research on this is needed.

Strengths and limitations

The strengths of this study lie in its large sample and its embedding in routine PCH, a program that reaches >90% of the total Dutch population. Moreover, we made use of data registered during the routine health and developmental monitoring that is offered to all Dutch children, and that is collected and registered according to a highly standardized format.

Some limitations should be taken into account when interpreting the findings. First, peer information was only available for a subset of the TRAILS population; adolescents in special education were not included in the subset, and in our subsample, behavioral problems occurred less frequently than in the remaining group. However, it may be inferred that the predictive power of early PCH findings for this group is even better. Second, children may have received effective treatment for their developmental and behavioral problems between the ages of 4 and 11 years, leading to an underestimation of the predictive power of PCH findings. A related issue is that some highly predictive risk factors may not have been included in our models because, owing to their low prevalence, they did not show multivariate or other effects. This may, for instance, be the case for birth defects. Finally, there might be some information bias, for example, regarding alcohol use. PCH risk factors were assessed in the early 1990s, and the validity of these risk factors is high. However, with regard to alcohol use during pregnancy, at that time, clear guidelines did not yet exist about drinking alcohol during pregnancy [34].

We are the first to study multiple early childhood predictors—from PCH files—of neglected and rejected young adolescents who were assessed with peer nominations in a longitudinal design. PCH professionals could closely monitor children and adolescents identified in such a way and could provide early counseling or treatment if needed. There are several effective interventions for acquiring better social skills and building friendships and self-esteem [19–21]. As our study is the first of its kind, our results are in need of replication by other studies, with larger sample sizes and including the possibility of examining gender differences and searching for a set of predictive core dimensions, similar to what has been done for temperament [35].

Findings from PCH professionals on early childhood development and social behavior are predictive for a neglected and rejected status in early adolescence from the general population. PCH is a good setting to monitor risk factors that predict the social status of children and adolescents.

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