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The early detection of psychosocial problems in children aged 0 to 6 years by Dutch preventive child healthcare

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**The early detection of psychosocial problems
in children aged 0 to 6 years by Dutch
preventive child healthcare:
professionals and their tools**

Meinou H. C. Theunissen

Colofon

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RIJKSUNIVERSITEIT GRONINGEN

**The early detection of psychosocial problems
in children aged 0 to 6 years by Dutch
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professionals and their tools**

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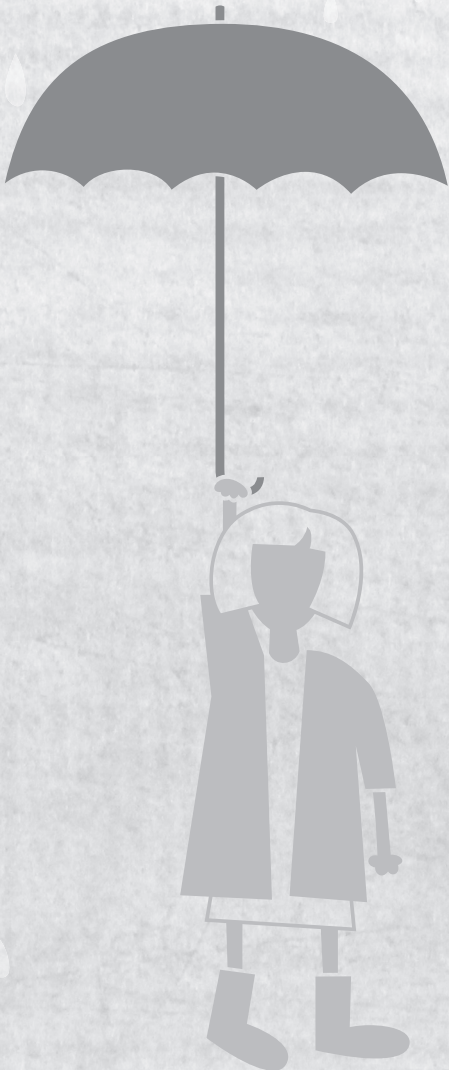
Marianne S. de Wolff

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Chapter 1

General introduction



Introduction

The main aim of this thesis was to investigate the early detection of psychosocial problems in children aged 6 months to 6 years by the Dutch Preventive Child Healthcare (PCH, in Dutch Jeugdgezondheidszorg – JGZ). It focuses in particular on the quality of detection by PCH and on the degree to which short questionnaires can improve this detection. An additional aim was to investigate the predictors (child, parent and family factors) of various discipline practices in parents. This information may support PCH to identify groups at risk for the use of aversive disciplining practices.

Psychosocial problems

“Psychosocial problems” are defined as problems in psychosocial functioning; they may be emotional but are often also visible in the child’s behavior.^{1,2} In general, psychosocial problems can be divided in three groups: behavioral/externalizing problems (such as hyperactivity, aggressive and delinquent behavior), emotional /internalizing problems (such as depressive feelings, anxiety) and social problems (difficulty to make contact with or keep contact with others).

Psychosocial problems are highly prevalent among children. Studies present different prevalences, depending on definition and operationalization. There are two approaches to assess the prevalence of psychosocial problems, the empirical approach and the diagnostic-normative one. In the empirical approach most estimates of the prevalence of psychosocial problems are based on the ASEBA questionnaires (Child Behavior Checklist (CBCL), Teacher Report Form (TRF) and Youth Self Report (YSR)).^{3,4} These questionnaires have been found to be highly reliable and valid, in all age groups and among many countries and cultures.⁵ Routinely, cut-off for elevated scores on these questionnaires are set at 10%, with those scoring above the cut-off denoted as having psychosocial problems.^{6,7} Using the USA cut-offs for the CBCL in the Netherlands, leads to estimates of 6% of all children aged 21 months to 4 years^{8,9} and 6-8% of all children aged 5 through 15 years^{9,10} to have a psychosocial problem.

Prevalence rates of problems differ among boys and girls per (type of) psychosocial problem. Externalizing problems were more prevalent among boys (ages 4-18 years); moreover, in adolescence internalizing problems were more prevalent among girls.^{11,12} Children born very preterm (<32 weeks' gestation) and moderate preterm (32-35 weeks' gestation) are more at risk for behavioral and emotional problems during (pre)school

age and adolescence.¹³⁻¹⁶ In the Netherlands, the prevalence of psychosocial problems is higher among immigrant children from non-industrialized countries (ie, former Dutch colonies and economic immigrants) than among indigenous children, especially regarding internalizing problems.^{17,18} Several studies also indicate that the socio-economic position of the areas in which children and adolescents live is associated with psychosocial problems, with problems occurring more often in deprived areas.^{19,20}

In the diagnostic-normative approach psychosocial problems in children are assessed by applying consensus-based criteria on psychosocial symptoms of children in order to get a diagnosis. These criteria and diagnosis are mostly based on the DSM classification of mental disorders. The DSM diagnostic system seems to apply less to the problems encountered by preschool children, therefore the DC0-3 is sometimes also used.²¹ This is typically done by either a mental health professional such as a child psychiatrist, or a trained lay following a structured interview system like the Composite International Diagnostic Interview (CIDI). Assessing the prevalence of psychosocial problems with DSM-IV criteria the literature shows a lifetime prevalence of Mental Disorders of 49.5 percent by age 18 in the USA.²²

Psychosocial problems are a major burden for children and their parents, because children with untreated psychosocial problems are likely to experience difficulties in various aspects of their daily functioning.²³ Psychosocial problems may have long-term negative consequences, like academic underachievement, substance abuse, and problems with the law.^{24,25}

Developmental trajectories of psychosocial problems

Psychosocial problems among children are relatively stable.^{26,27} Lavigne and colleagues²⁷ showed that more than 50% of the children with a psychiatric disorder at age 2 through 3 years continued to have some psychiatric disorder 3 to 4 years later. A longitudinal study of Mesman & Koot²⁶ showed that internalizing and externalizing problems among toddlers (2 and 3 three years old) were predictive of their DSM-IV counterparts 8 years later.

Prevention and early treatment of psychosocial problems

Primary prevention programs may prevent psychosocial problems and secondary prevention programs may improve the prognosis of children.²⁸⁻³¹ Primary prevention in mental health attempts to reduce the incidence of adjustment problems in currently normal populations as well as to promote mental health functioning. Secondary prevention consists of early detection and early treatment, involving interventions for individuals with subclinical-level problems. Nelson and Westhues³¹ evaluated the outcomes of 34 pre-school primary prevention programs. Results indicate that these programs have positive

short, medium and long-term impact effects on children's cognitive and social-emotional functioning and parent-family wellness. Durlak and Wells²⁸ evaluated the outcomes of 130 secondary preventive mental health interventions for children. Results indicate that most well designed secondary interventions reduce subclinical problems such as internalizing and externalizing problems. Intervention effects also endure over time, indicated by studies who collected follow-up data.

Preventive child healthcare

In the Netherlands, preventive child healthcare offers an ideal opportunity for the early detection of psychosocial problems among children, comparable to community pediatrics in the USA. In this PCH system, Child Healthcare Professionals (further: CHP), ie doctors and nurses, working in preventive child healthcare offer routine well-child clinics, including the early detection of psychosocial problems to the entire Dutch population. Access is independent of insurance status. The aim of the PCH is to monitor the physical, social, psychological and cognitive development of children and to identify problems in order to offer timely interventions. Furthermore, the system has been set up for the provision of the national vaccination programme. PCH services are mainly preventive, therefore they do not provide treatment except for short-term parenting support.^{2,32}

As part of the PCH system almost all Dutch children used to undergo 15 routine examinations at preschool-age (0-4 years), and three examinations during their school careers by a CHP. For school-aged children the examinations are at the ages 5-6, 10-11 and 13-14 years.³² Traditionally, these assessments consisted of a physical examination and an interview by a Child Healthcare nurse or doctor with parents and with older children (ages 13-14 years) themselves.

The last couple of years the working methods of the PCH is changing. There are two reasons for this. First, the traditional work method, where CHPs investigate all children at a regular pre-determined scheme, may be arranged more efficiently according to many PCH organizations. This has become more urgent because of severe pressure on the available budgets. Second, the traditional approach may provide too little opportunities to provide adequate attention to health protection and health promotion for children that are at higher risk for problems. Triage-based work methods for the PCH were developed. In this system, CHPs select children based on there need of care. Child Healthcare assistants and/or nurses screen all children during routine examinations; nurses and doctors perform follow-up assessment if needed for children at risk. Several PCH organizations in the Netherlands

adopted a triage-based work method. The effects of this new work method in PCH on the quality of care has not yet been investigated.

Identification of psychosocial problems by PCH

Although PCH is important for the early identification of psychosocial problems, several studies have shown a need for improvements in the identification of psychosocial problems by the CHP.^{8,10,18,33,34} The literature shows that CHPs failed to identify problems in 72% of the children aged 21 months to 4 years⁸ and in 43% of the children aged 5 through 15 years, for which parents reported problems on the CBCL.¹⁰ Furthermore, 6.8% of the preschool-aged children (21 months to 4 years) and 21% of the school-aged children (5 through 15 years) with no clinical problems on the CBCL were identified as having psychosocial problems by the CHP.^{8,10} In the USA, similar results were found regarding the quality of identification of psychosocial problems by pediatric care providers.³⁵

Vogels and colleagues showed that the proportion of children identified with problems varies widely between individual CHPs.³⁴ This variation could not be explained by the prevalence of problems or by differences in child background characteristics such as gender and age.

Crone and colleagues showed that the quality of identification by CHPs is worse among immigrant children from non-industrialized countries (ie, former Dutch colonies and economic immigrants) than among indigenous children (ie, Dutch and other industrialized countries). In other words: the association between the identification of psychosocial problems by CHPs and CBCL score was weaker for immigrant children than for indigenous children.¹⁸

Improving the identification of psychosocial problem by CHPs

Several methods have been developed to improve the quality of the identification of psychosocial problem by CHPs. Examples concern a structuring of the diagnostic process by training CHPs in the use of a detailed protocol³⁶ and the use of validated questionnaires for the detection of psychosocial problems.³⁷

Structuring the diagnostic process

One of these methods to improve the quality of the identification of psychosocial problem by CHPs is by structuring the diagnostic process.³⁶ A detailed protocol for the identification of problems in children by Dutch CHPs was developed and tested. This protocol enables CHPs to systematically categorize signals from parents and child regarding psychosocial problems. A large number of CHPs (n = 58) throughout the country received training in the use of this protocol. Wiefferink and colleagues conducted a RCT on the effect of this training. Their results showed that the training improved the identification of moderate and severe psychosocial problems, but only on the short term.³⁶

Questionnaires on psychosocial problems in preventive child healthcare

Another method to improve the quality of identification of psychosocial problems by PCH may be the use of validated questionnaires.³⁷ A suitable questionnaire for the detection of psychosocial problems by PCH needs to comply with a large number of demands.³⁸ General demands are related to the psychometric properties of the questionnaires. It is important that the questionnaires measures what the user wants it to measure (validity) and its needs to do this punctually and accurately (reliability).³⁹ Validity can be measured by calculating the sensitivity and the specificity of a questionnaires. Sensitivity is the ability of the instrument to identify accurately children who truly have the problems, and specificity is the ability of the instrument to identify accurately children without the problem. Besides demands related to psychometric properties the questionnaires needs to fit PCH requirements. The questionnaire needs to offer information not already available from other sources during routine assessment of the PCH. Furthermore, the questionnaire needs to comply with a number of usability demands for routine PCH practice, such as short length, understandability and ease of completing by parents.

At school-age, many PCH services use the Strengths and Difficulties Questionnaire (SDQ) during the routine examinations (ages 5-6, 10-11 and 13-14 years).^{38,40} The SDQ has been validated in the Netherlands for the ages 7-11 years. The psychometric properties of the SDQ were good and the SDQ fits PCH requirements.³⁷ For the routine examinations at the ages 5-6 and 13-14 years no validated parent reported questionnaires with good psychometric properties are available. For the young group (ages 5-6 years) some PCH organizations use the National Checklist for Indicating Psychosocial Problems in Five/Six Year Olds (LSPPK). The validity of the LSPPK has been assessed in the Netherlands. The results show that the LSPPK can distinguish between children with and without problems, but there is room for improvement.⁴¹ The PCH guideline "Early detection of psychosocial problems" recommends to use the SDQ during routine examinations at the ages 10-11

years.⁴⁰ For the two other routine examinations (ages 5-6 and 13-14 years) the guideline recommends to continue the use of a questionnaire that is already implemented in the PCH service. If no questionnaire is implemented, it is recommended to use the SDQ until more validation results are available.⁴⁰

At preschool-age the use of short parent-reported questionnaires for the detection of psychosocial problems by PCH was limited. A major reason for this was that no validated Dutch questionnaires were available to support the detection of problems among 0 to 4-year-olds. Although the KIPPPPI (a Dutch questionnaire, the acronym standing for Short Instrument for the Psychological and Pedagogical Inventory) was not validated, some PCH services used this questionnaire during routine examinations at preschool-age.

In the PCH guideline “early detection of psychosocial problems” it is recommended to use one of the promising questionnaires for routine examinations for preschool children.⁴⁰ Examples are the SDQ 3-4,^{42,43} the Ages and Stages questionnaires: Social-Emotional (ASQ:SE)⁴⁴ and the KIPPPPI. No published studies in the Netherlands are available that assessed the psychometric properties of the SDQ 3-4, ASQ:SE or the KIPPPPI.

The role of parents and parenting in the aetiology and prevention of psychosocial problems

Good parenting is important for the health and development of children, such as the child emotional and behavioural functioning.⁴⁵⁻⁴⁷ Inadequate parenting is related with preschool behaviour problems.^{48,49}

How do parenting factors relate to problem behaviour of the child? One task of parents is to provide a safe and affectionate environment. Another task is to set and enforce reasonable rules. Parental failure to fulfil these tasks is related to child problem behaviour.^{50,51} For instance, lack of parental support and warmth has been associated with lack of empathy and concern for others.⁵¹ Lack of clear rules and consistent discipline have been linked to difficulties in self-regulation and deficits in social skills.⁵⁰

Punishment and rewarding disciplining parenting practices

An important aspect of parenting is the approach of parents to discipline children. Parents may use various approaches: spanking or cuddling, for example. Generally, these approaches can be classified as either punishment or reward practices. “Punishment” means parental practices that aim to eliminate undesired behaviours. Examples are time-

outs, removing privileges, yelling and spanking. “Rewarding” means parental practices that aim to strengthen desired behaviours. Examples are cuddling, complimenting or granting privileges (watching TV, sweets, etc.).

Given the evidence of the harmful effect of aversive disciplining, counselling for parents about alternative discipline styles is of great practical significance.^{52,53} Parents who are struggling with the demands of child rearing may be helped by a variety of parenting programmes, such as the Triple P-positive Parenting programme.⁵⁴ PCH can play an important role in identifying this need and in facilitating access to services that provide such parenting support. Currently, disciplining parenting practices are not the main focus of PCH. One of the reason may be that information is lacking about how to identify parents at risk for aversive discipline practices. First, more information needs to be gathered about the prevalence of different discipline practices and the groups at risk. With this information profiles of parents can be made. This enables PCH to efficiently identify parents who use aversive disciplining practices, such as spanking.

Research questions and outline of this thesis

The main aim of this thesis was to investigate the early detection of psychosocial problems in children aged 6 months to 6 years by PCH. It focuses in particular on the quality of detection and on the degree to which short questionnaires can improve this detection by PCH. An additional aim was to investigate the predictors (child, parent and family factors) of various discipline practices in parents. This information may support PCH to identify groups at risk for the use of aversive disciplining practices.

The following research questions will be answered in this thesis:

1. What is the quality of identification of psychosocial problem by preventive child healthcare professionals (CHPs) in children aged 5-6 years? Has the quality improved after a series of nationwide interventions?
2. Does the proportion of children identified as having psychosocial problems vary between individual CHPs? If yes, could this variation be explained by CHP characteristics, such as work experience? Are CHP characteristics related to the quality of problem identification by CHPs?
3. What are the psychometric properties of a number of short questionnaires (SDQ, KIPPPI, ASQ:SE, BITSEA) that PCH can use in the identification of psychosocial problems in preschool children and could these questionnaires improve the identification by CHPs?

A major focus is at the SDQ, because many PCH services use this questionnaires for school-age children.

4. What are the prevalence rates and predictors (child, parent and family factors) of different discipline practices in parents of children aged 5-6 years?

In Chapter 2 the quality of identification of psychosocial problems by CHPs in children aged 5-6 years is assessed. Next, it is assessed whether this identification has improved in the period 1997-2003. In this period a number of nationwide interventions tried to improve the identification of psychosocial problems, such as the development and validation of several short questionnaires and a training for CHPs throughout the country to improve their diagnostic skills.

In Chapter 3 the variation among individual CHPs in the proportion of children identified as having psychosocial problems is assessed. Next, it is assessed whether this variation can be explained by CHP characteristics (such as work experience) and whether CHP characteristics were related to the quality of problem identification.

In Chapter 4 we compare the psychometric properties (internal consistency, and validity) and the added value of three parent-reported questionnaires (KIPPPI, ASQ:SE, BITSEA) for the identification of psychosocial problems in children aged 6 months to 2 years by PCH. The added value refers to the degree to which the questionnaire can improve the identification of children with problems based solely on clinical assessment by the CHP without knowledge of the questionnaire. Each questionnaire is validated using an elevated CBCL score as criterion.

In Chapter 5 we compare the psychometric properties (internal consistency, scale structure and validity) and the added value of three parent-reported questionnaires (SDQ, KIPPPI, ASQ:SE) for the identification of psychosocial problems among 3-4 years old children by PCH. Each questionnaires is validated using the following criteria: an elevated CBCL score and currently receiving treatment for psychosocial problems.

In Chapter 6 the psychometric properties of the SDQ among preschool-aged children (3-4 years) is assessed. The internal consistency, the scale structure, the validity (eg sensitivity and specificity) and the added value for PCH are evaluated.

In Chapter 7 the prevalence and predictors (child, parent and family factors) of different discipline practices in parents of children aged 5-6 years is assessed. Associations are examined between discipline practices and child (eg child age and gender, ethnicity), parent (eg parental educational level and employment status) and family factors (eg urbanization and family income).

In Chapter 8 the main findings of this thesis are summarized and discussed.

References

1. Blokland G. Groepsgerichte opvoedondersteuning. *Nederlands Tijdschrift voor Jeugdzorg*. 2002;2:97-103.
2. Ministerie van VWS. *Basistakenpakket jeugdgezondheidszorg*. Den Haag: Ministerie van VWS; 2002.
3. Koot HM, Van Den Oord EJ, Verhulst FC, Boomsma DI. Behavioral and emotional problems in young preschoolers: Cross-cultural testing of the validity of the child behavior Checklist/2-3. *J Abnorm Child Psychol*. 1997;25(3):183-196.
4. Verhulst FC, van der Ende J, Koot HM. *Manual for the CBCL/4-18 (in Dutch)*. Rotterdam: Erasmus University/Dept of Child and Adolescent Psychiatry, Sophia Childrens' Hospital; 1996.
5. Ferdinand RF, Visser JH, Hoogerheide KN, et al. Improving estimation of the prognosis of childhood psychopathology; combination of DSM-III-R/DISC diagnoses and CBCL scores. *J Child Psychol Psychiatry*. 2004;45(3):599-608.
6. Achenbach TM. *Manual for the child behavior checklist/4-18 and 1991 profile*. Burlington, VT: University of Vermont; 1991.
7. Achenbach TM. *Integrative guide for the 1991 CBCL/4-18, YSR, and TRF profiles*. Burlington, VT: University of Vermont; 1991.
8. Reijneveld SA, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems among toddlers in Dutch preventive child health care. *Arch Pediatr Adolesc Med*. 2004;158(8):811-817.
9. Zeijl E, Crone MR, Wiefferink K, Keuzenkamp S, Reijneveld SA. *Kinderen in Nederland*. Den Haag/Leiden: SCP/TNO; 2005.
10. Brugman E, Reijneveld SA, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems by preventive child health care. *Arch Pediatr Adolesc Med*. 2001;155(4):462-469.
11. Bongers IL, Koot HM, van der Ende J, Verhulst FC. The normative development of child and adolescent problem behavior. *J Abnorm Psychol*. 2003;112(2):179-192.
12. Moffitt TE, Caspi A. Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. *Dev Psychopathol*. 2001;13(2):355-375.
13. Reijneveld SA, de Kleine MJ, van Baar AL, et al. Behavioural and emotional problems in very preterm and very low birthweight infants at age 5 years. *Arch Dis Child Fetal Neonatal Ed*. 2006;91(6):F423-8.

14. Potijk MR, de Winter AF, Bos AF, Kerstjens JM, Reijneveld SA. Higher rates of behavioural and emotional problems at preschool age in children born moderately preterm. *Arch Dis Child*. 2012;97(2):112-117.
15. van Baar AL, Vermaas J, Knots E, de Kleine MJ, Soons P. Functioning at school age of moderately preterm children born at 32 to 36 weeks' gestational age. *Pediatrics*. 2009;124(1):251-257.
16. Talge NM, Holzman C, Wang J, Lucia V, Gardiner J, Breslau N. Late-preterm birth and its association with cognitive and socioemotional outcomes at 6 years of age. *Pediatrics*. 2010;126(6):1124-1131.
17. Reijneveld SA, Harland P, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Psychosocial problems among immigrant and non-immigrant children--ethnicity plays a role in their occurrence and identification. *Eur Child Adolesc Psychiatry*. 2005;14(3):145-152.
18. Crone MR, Bekkema N, Wiefferink CH, Reijneveld SA. Professional identification of psychosocial problems among children from ethnic minority groups: Room for improvement. *J Pediatr*. 2010;156(2):277-284.
19. Reijneveld SA, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Area deprivation and child psychosocial problems--a national cross-sectional study among school-aged children. *Soc Psychiatry Psychiatr Epidemiol*. 2005;40(1):18-23.
20. Reijneveld SA, Veenstra R, de Winter AF, Verhulst FC, Ormel J, de MG. Area deprivation affects behavioral problems of young adolescents in mixed urban and rural areas: The TRAILS study. *J Adolesc Health*. 2010;46(2):189-196.
21. Zero to three, National center for Clinical infant programs. *Diagnostic classification of mental health and developmental disorders of infant and early childhood*. autor: Arlington, VA; 1994.
22. Merikangas KR, He JP, Burstein M, et al. Lifetime prevalence of mental disorders in U.S. adolescents: Results from the national comorbidity survey replication--adolescent supplement (NCS-A). *J Am Acad Child Adolesc Psychiatry*. 2010;49(10):980-989.
23. Leaf PJ, Alegria M, Cohen P, et al. Mental health service use in the community and schools: Results from the four-community MECA study. methods for the epidemiology of child and adolescent mental disorders study. *J Am Acad Child Adolesc Psychiatry*. 1996;35(7):889-897.
24. Ferdinand RF, Blum M, Verhulst FC. Psychopathology in adolescence predicts substance use in young adulthood. *Addiction*. 2001;96(6):861-870.
25. Koot HM, Verhulst FC. Prediction of children's referral to mental health and special education services from earlier adjustment. *J Child Psychol Psychiatry*. 1992;33(4):717-729.

26. Mesman J, Koot HM. Early preschool predictors of preadolescent internalizing and externalizing DSM-IV diagnoses. *J Am Acad Child Adolesc Psychiatry*. 2001;40(9):1029-1036.
27. Lavigne JV, Arend R, Rosenbaum D, Binns HJ, Christoffel KK, Gibbons RD. Psychiatric disorders with onset in the preschool years: II. correlates and predictors of stable case status. *J Am Acad Child Adolesc Psychiatry*. 1998;37(12):1255-1261.
28. Durlak JA, Wells AM. Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *Am J Community Psychol*. 1998;26(5):775-802.
29. Durlak JA, Wells AM. Primary prevention mental health programs for children and adolescents: A meta-analytic review. *Am J Community Psychol*. 1997;25(2):115-152.
30. Geeraert L, Noortgate van den W, Grietens H, Onghena P. The effects of early prevention programs for families with young children at risk for physical child abuse and neglect: A meta-analysis. *Child Maltreat*. 2004;9(3):277-291.
31. Nelson G, Westhues A, MacLeod J. A meta-analysis of longitudinal research on pre-school prevention programs for children. *Prevention and Treatment*. 2003;6:1-32.
32. Dunnink G, Lijs-Spek WJG. *Activiteiten basistakenpakket jeugdgezondheidszorg 0-19 jaar per contactmoment*. RIVM/Centrum Jeugdgezondheid; 2008.
33. Reijneveld SA, de Meer G., Wiefferink CH, Crone MR. Detection of child abuse by Dutch preventive child-healthcare doctors and nurses: Has it changed? *Child Abuse Negl*. 2008;32(9):831-837.
34. Vogels AG, Jacobusse GW, Hoekstra F, Brugman E, Crone M, Reijneveld SA. Identification of children with psychosocial problems differed between preventive child health care professionals. *J Clin Epidemiol*. 2008;61(11):1144-1151.
35. Sheldrick RC, Merchant S, Perrin EC. Identification of developmental-behavioral problems in primary care: A systematic review. *Pediatrics*. 2011;128(2):356-363.
36. Wiefferink CH, Reijneveld SA, de Wijs J, Swagerman M, Campman D, Paulussen TG. Screening for psychosocial problems in 5-6-year olds: A randomised controlled trial of routine health assessments. *Patient Educ Couns*. 2006;60(1):57-65.
37. Vogels AG, Crone MR, Hoekstra F, Reijneveld SA. Comparing three short questionnaires to detect psychosocial dysfunction among primary school children: A randomized method. *BMC Public Health*. 2009;9(1):489.
38. GGD Nederland. *Handleiding voor het gebruik van de SDQ binnen de jeugdgezondheidszorg*. GGD Nederland; 2006.
39. Weitzman CC, Leventhal JM. Screening for behavioral health problems in primary care. *Curr Opin Pediatr*. 2006;18(6):641-648.

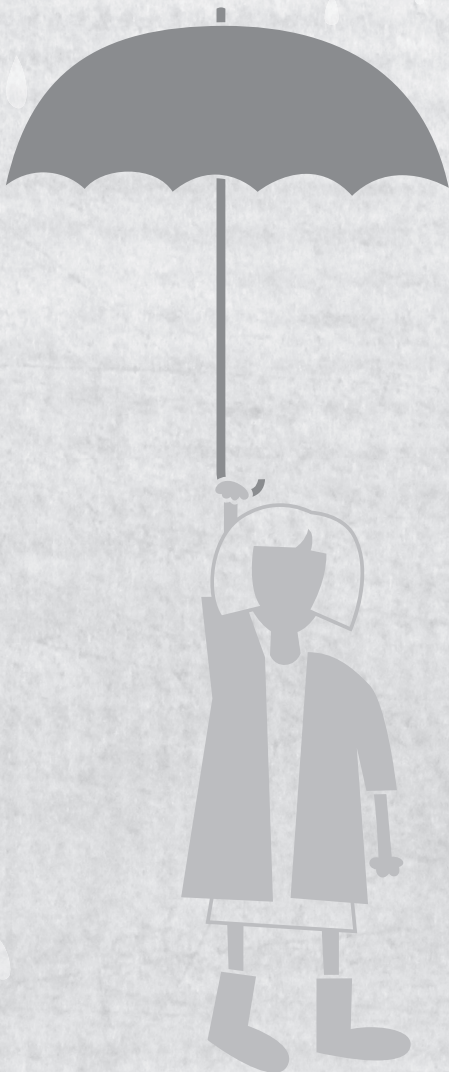
40. Postma S. *JGZ-richtlijn vroegsignalering van psychosociale problemen*. Bilthoven: RIVM/Centrum Jeugdgezondheid; 2008.
41. Vogels T, Reijneveld SA, Brugman E, den Hollander-Gijsman M, Verhulst FC, Verloove-Vanhorick SP. Detecting psychosocial problems among 5-6-year-old children in preventive child health care: The validity of a short questionnaire used in an assessment procedure for detecting psychosocial problems among children. *Eur J Public Health*. 2003;13(4):353-360.
42. Goodman R. The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*. 1997;38:581-586.
43. Goodman R, Ford T, Simmons H, Gatward R, Meltzer H. Using the strengths and difficulties questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *British Journal of Psychiatry*. 2000;177:534-539.
44. Squires J, Bricker D, Twombly E. *Ages & stages questionnaires: Social-emotional. A parent-completed child-monitoring system for social-emotional behaviors*. Baltimore: Brookes Publishing; 2003.
45. Dekovic M, Janssens JM, Van As NM. Family predictors of antisocial behavior in adolescence. *Fam Process*. 2003;42(2):223-235.
46. O'Connor TG. Annotation: The 'effects' of parenting reconsidered: Findings, challenges, and applications. *J Child Psychol Psychiatry*. 2002;43(5):555-572.
47. Schore A. *Affect regulation and the origin of the self: The neurobiology of emotional development*. Mahwah, New Jersey: Erlbaum; 1994.
48. Madigan S, Bakermans-Kranenburg MJ, Van Ijzendoorn MH, Moran G, Pederson DR, Benoit D. Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attach Hum Dev*. 2006;8(2):89-111.
49. Shaw DS, Owens EB, Giovannelli J, Winslow EB. Infant and toddler pathways leading to early externalizing disorders. *J Am Acad Child Adolesc Psychiatry*. 2001;40(1):36-43.
50. Patterson GR, DeBaryshe BD, Ramsey E. A developmental perspective on antisocial behavior. *Am Psychol*. 1989;44(2):329-335.
51. Baumrind D. Parenting styles and adolescent development. In: Lerner RM, Petersen AC, Brooks-Gunn J, eds. *Encyclopedia of adolescence*. New York: Garland Publishing; 1991:746.
52. Gershoff ET. Corporal punishment by parents and associated child behaviors and experiences: A meta-analytic and theoretical review. *Psychol Bull*. 2002;128(4):539-579.

53. Straus MA, Stewart JH. Corporal punishment by american parents: National data on prevalence, chronicity, severity, and duration, in relation to child and family characteristics. *Clin Child Fam Psychol Rev.* 1999(2):55-70.
54. Sanders MR. Triple P-positive parenting program as a public health approach to strengthening parenting. *J Fam Psychol.* 2008;22(4):506-517.

Chapter 2

Early detection of psychosocial problems in children aged 5 to 6 years by preventive child healthcare: has it improved?

M.H.C. Theunissen
A.G.C. Vogels
S. A. Reijneveld



Abstract

Objective

To assess whether the quality of identification of psychosocial problems by preventive child healthcare professionals (CHPs) in children aged 5 to 6 years has improved after a series of nationwide interventions.

Study design

We analyzed data about 8440 children aged 5 to 6 years, who were assessed during routine well-child visits by CHPs (response rates, 85% to 90%). Of these children, 4339 were assessed before the interventions. Parents completed the Child Behavior Checklist (CBCL) and CHPs reported on psychosocial problems that they identified in children. The agreement between identification of psychosocial problems by CHPs and parent-reported problems on the CBCL were assessed before and after the nationwide interventions.

Results

CHPs identified psychosocial problems in 22%-28% of all children. Identification of psychosocial problems by CHPs was much more likely in children with an elevated CBCL total problems score than in others (OR: 4.65, 95% CI:3.28-6.58). The quality of identification by CHPs did not improve after the interventions, the OR for improvement was 0.81 (95% CI: 0.57-1.15).

Conclusions

The quality of problem identification by CHPs has not improved. CHPs still miss many cases with parent-reported problems on the CBCL. Additional efforts are needed to improve early identification of psychosocial problems.

Introduction

Psychosocial problems, such as behavioral and emotional problems are highly prevalent among children, and can severely interfere with everyday functioning.^{1,2} Such problems can be severe and persist over time.^{3,4} Early detection and treatment may ameliorate the prognosis of these children.^{5,6}

Community pediatric services, offering routine healthcare services to the population as a whole, are important for the early identification of psychosocial problems in children not yet receiving treatment. In the Netherlands this early identification is a routine task for the Preventive Child Healthcare (PCH) system.

Although PCH is important for the early identification of psychosocial problems, several studies have indicated that the identification of psychosocial problems by Child Healthcare Professionals (CHPs) leaves room for improvement.^{1,7-9} CHPs failed to identify psychosocial problems in about half the children whose parents reported serious problems on the Child Behavior Checklist (CBCL).^{1,8}

In the past 2 decades, there has been an increasing awareness of the importance of the early identification by PCH of psychosocial problems in children.¹⁰ This resulted in several initiatives and interventions for improving identification. Examples are the development, validation, and implementation of several questionnaires for the detection of psychosocial problems,^{11,12} such as the National Checklist for Indicating Psychosocial Problems in Five/Six Year Olds^{13,14} and the Short Indicative Questionnaire for Psychosocial Problems Among Adolescents.¹⁵ In 2001-2002, a large number of CHPs (n = 58) throughout the country received training in the use of a structured method to improve their diagnostic skills for identifying psychosocial problems in children. Wiefferink et al studied the effectiveness of this training; their results showed that the training led to improvements in the identification of moderate and severe psychosocial problems.¹⁶ As a result of the increased emphasis on screening for psychosocial problems, we expect an improvement in the identification by CHPs of psychosocial problems in children.

The aim of this study was to test this hypothesis. The period 1997-2003 was selected because there were a number of interventions to improve the identification of psychosocial problems during this period and because the data sources we included in this study covered this time period.

Methods

During the period 1997-2003, we conducted 3 studies with similar methodologies. The data from each study were collected in the framework of the routine preventive health assessments conducted regularly for all Dutch children.

Datasets

Data came from the following sources:

- (1) A cross-sectional national study conducted in 1997-1998 (ages 5-15 years, n = 4480, response rate 90.1%).¹ Thirty-two percent of the children were 5-6 years old;
- (2) A randomized controlled trial (RCT) conducted in 2001-2002 to evaluate the effects of a training program for CHPs in a national sample of children aged 5-6 years (n = 7737, response rate 85.2%). This RCT study included a baseline measurement and follow-up measurements. In order to measure the effect of this training, we compiled 2 datasets for this data source. One dataset includes all children who were examined before the initial training of the CHP (called the "RCT baseline," dataset 2a), and the other dataset includes all the children examined after the initial training for the CHPs ("RCT follow-up," dataset 2b); and
- (3) A cross-sectional study conducted in 2002-2003 (ages 0-12 years, n = 4776, response rate 85%). Thirty-four percent of the children were 5-6 years old.⁹

The 3 studies used the same 2-step data collection procedure. First, PCH services were asked to participate. And second, PCH services personnel who agreed to participate were asked to provide data about a specified number of children. All 3 studies were approved by the local institutional review board. The 3 data sources were representative for the Dutch population.

Measurements

In each study, parents completed the CBCL, a well-validated questionnaire about behavioral and emotional problems over the preceding 6 months¹⁷⁻¹⁹; in studies 1 and 2, the CBCL/4-18,¹⁹ and in study 3, the revised CBCL (CBCL/1.5-5).²⁰ The CBCL contains 120 problem items (CBCL/4-18) or 100 problem items (CBCL/1.5-5) that are used to compute a total problem score. Children were allocated to a normal range or an elevated range using the 90th percentile sex-specific cutoff points. The parents returned the CBCL questionnaire in a sealed envelope to the CHP, who forwarded the envelope to the researchers unopened. The CHPs then took a routine history and conducted a physical assessment of each child before answering the following question: "Does the child have a psychosocial problem

at this moment?" (yes or no). If a problem was identified, the CHP was asked to rate its severity as mild, moderate, or severe.

The CHPs recorded the following child and family characteristics: child sex and gender, parental educational level and employment, and family composition. Parental educational level concerned the highest level of education completed successfully by a parent. Family composition focused on the number of parents in the family (2 parents or 1 parent). These background characteristics are presented in Table 1.

Analysis

Data about a total of 8440 children were used to answer our research questions. We excluded children with non-Dutch ethnicity (ie, those with at least 1 parent born outside the Netherlands) because previous research has shown that CHPs have more difficulty in identifying psychosocial problems in non-Dutch children than in Dutch children.^{7,21}

First, we assessed differences in background characteristics between the datasets using χ^2 tests and the Cohen effect size index w^{22} (see Table 1). The children receiving treatment (4%-7% of all children) were excluded from subsequent analyses (steps 2-4), because we assumed that their psychosocial problems were already known to CHPs. Second, we calculated the percentages of children with an elevated CBCL score and of children identified as having a psychosocial problems by the CHPs. Third, we calculated sensitivity, specificity, and the OR for CHP problem identification by CBCL score in each dataset.

Fourth, the overall change in quality of CHP identification was investigated using multilevel logistic regression analyses of the association between CHP identification and CBCL score. Multilevel techniques were used because of the hierarchical nature of the data. Multilevel models account for the clustering of individual data by the CHP ($n = 189$).^{23,24} To enhance the power of the multilevel logistic regression analyses, we combined the 2 datasets with the children assessed before the initial training of the CHPs (datasets 1 and 2a) and we combined the 2 datasets with the children assessed after the training of the CHPs (datasets 2b and 3) (this is the "time period" variable). A multilevel logistic regression analysis was conducted with problem identification by CHPs as the outcome variable and the time period, CBCL score, and interaction time period \times CBCL score as the independent variables. Previous research has shown that child and family characteristics may affect problem identification by CHPs.¹ We therefore repeated the multilevel logistic regression analysis, adjusting for these characteristics.

Finally, we repeated all analyses (steps 2-4) in the subgroup of children whom CHPs had identified as having moderate or severe problems to investigate whether CHPs assessed these problems better.

Results

Background characteristics

Table 1 shows that differences between the datasets with regard to child sex and age, family composition, parental employment, parental educational, and treatment were small according to the Cohen effect size index w (range of w : 0.01-0.24).

Table 1. Background characteristics of children aged 5 and 6 years by dataset

	Cross-sectional dataset 1997-1998	RCT baseline dataset 2001-2002	RCT follow-up dataset 2001-2002	Cross-sectional dataset 2002-2003	
	(1)	(2a)	(2b)	(3)	
	N = 1153	N = 3186	N = 3052	N = 1049	
	%	%	%	%	Cohen effect size index w
Sex					.01
Boy	51.7	50.9	50.7	50.0	
Girl	48.3	49.1	49.3	50.0	
Age					.24
5 years	65.3	79.6	54.7	57.7	
6 years	34.7	20.4	45.3	42.3	
Family composition					.02
Two-parent family	94.5	93.9	93.8	91.9	
One-parent family	5.2	5.1	4.9	6.3	
Other/unknown	0.3	1.0	1.3	1.8	
Parental employment					.08
At least 1 parent employed >16h/week	94.5	92.2	90.3	95.0	
No parent employed >16h/week	0.7	1.8	3.4	1.0	
Unknown	4.8	6.0	6.2	4.0	
Parental educational level					.10
Low	29.4	31.2	30.9	23.5	
Medium	35.4	39.4	41.8	36.7	
High	34.8	28.6	26.0	38.6	
Unknown	0.4	0.8	1.4	1.1	
Under treatment	5.8	3.6	4.1	6.6	.05

Due to rounding off, not all column percentages add up to 100%

Problem identification by CHP and CBCL score

Table 2 shows the percentages of nontreated children with an elevated CBCL score and the percentages of nontreated children identified as having psychosocial problems by CHPs in each dataset.

Table 2. Percentages of children with an elevated CBCL score and the percentages of children identified as having psychosocial problems by CHPs by dataset

	Cross-sectional dataset 1997-1998	RCT baseline dataset 2001-2002	RCT follow-up dataset 2001-2002	Cross-sectional dataset 2002-2003
	(1)	(2a)	(2b)	(3)
	N = 1086	N = 3071	N = 2926	N = 980
	%	%	%	%
All problems				
Elevated CBCL score	9.4	9.3	8.9	8.6
CHP-identified problem	21.8	26.2	28.2	26.0
Moderate/severe problems				
Elevated CBCL score	9.4	9.3	8.9	8.6
CHP-identified problem	9.5	8.6	9.6	8.0

Sensitivity, specificity, and ORs ratios: Problem identification by CHPs vs. CBCL score

Table 3 presents the sensitivity and specificity of problem identification by CHPs by CBCL score. Children with an elevated CBCL score were much more likely to be identified as having psychosocial problems by CHPs than were children with a nonelevated CBCL score (ORs: 3-6). ORs did not increase over time, indicating that the quality of CHP identification did not improve in the period 1997-2003.

ORs were slightly higher in children with moderate and severe problems (33.6%) but did not increase in them as well.

Table 3. Association of CHP identification with CBCL score: sensitivity, specificity, and OR values

	Cross-sectional dataset 1997-1998	RCT baseline dataset 2001-2002	RCT Follow-up dataset 2001- 2002	Cross-sectional dataset 2002-2003
	(1)	(2a)	(2b)	(3)
	N = 1086	N = 3071	N = 2926	N = 980
	%	%	%	%
All problems				
Sensitivity	57.8	57.7	53.3	56.0
Specificity	81.9	77.1	74.3	76.8
CHP identified problem: OR (95% CI)	6.21 (4.06-9.51)	4.58 (3.56-5.88)	3.29 (2.54-4.27)	4.20 (2.66-6.64)
Moderate/severe problems				
Sensitivity	29.4	28.3	26.3	22.6
Specificity	92.6	93.4	92.0	93.4
CHP identified problem: OR (95% CI)	5.20 (3.19-8.47)	5.59 (4.15-7.52)	4.10 (3.01-5.59)	4.15 (2.33-7.37)

Overall change in quality of identification by CHPs

Table 4 shows findings to be similar if comparing all measurements before and after the intervention.

Table 4. Association of CHP identification with CBCL score, and change in these association from before a series of nationwide interventions to improve it to afterwards: OR

	Model 1 Crude	Model 2 Adjusted for background characteristics
	OR (95% CI)	OR (95% CI)
All problems		
Time period after vs. before interventions*	1.18 (0.93-1.49)	1.19 (0.94-1.52)
CBCL score (elevated score vs. normal score)	4.65 (3.28-6.58)†	4.71 (3.72-5.95)†
Interaction: Time period × CBCL score	0.81 (0.57-1.15)	0.78 (0.55-1.09)
Moderate/severe problems		
Time period after vs. before interventions *	1.05 (0.79-1.40)	1.03 (0.77-1.40)
CBCL score (elevated score vs. normal score)	5.45 (4.15-7.16)†	5.48 (4.15-7.24)†
Interaction: Time period × CBCL score	0.87 (0.66-1.14)	0.83 (0.55-1.25)

Problem identified by CHPs as the outcome variable and time period, CBCL score and interaction time period × CBCL score as independent variables (N=7458)

* after = datasets 2b and 3; before = datasets 1 and 2a

† P < .01

Discussion

We show that CHPs are more likely to detect psychosocial problems in children with an elevated CBCL score. However, contrary to our expectation, little has changed in the quality of problem identification by CHPs in the period 1997-2003, despite several nationwide interventions to improve this quality such as CHP training.

Can these results be explained by artifacts? First, differences in child background characteristics between the datasets might be a cause. However, the adjustments for the small differences in background characteristics did not affect changes in the quality of CHP identification over time.

Second, the CBCL questionnaire may not be a perfect “gold standard”. CHPs identify mostly mild psychosocial problems in children, whereas the CBCL focuses more on severe problems.¹⁹ This may add a measurement error, however, but no bias because this would affect all datasets in a similar way. Furthermore, a restriction of the analyses to moderate/severe problems yielded similar results.

Third, the use of 2 versions of the CBCL questionnaire might be an explanation. However, analyses of the datasets with similar CBCL versions yielded identical findings.

The results of this study show that CHP identification of psychosocial problems actually did not improve in the period 1997-2003. Reijneveld et al concluded the same in a study on trends in the rate of detection of suspected child maltreatment (3-12 years old) by CHPs.⁹ At first sight, our findings contradict another previous study of the quality of diagnostic skills of CHPs.¹⁶ Wiefferink et al¹⁶ conducted an RCT on the effect of training CHPs to improve diagnostic competence and found an improvement on the first follow-up measurement, immediately after the training. At the second follow-up the quality of identification had fallen off again. This difference can be explained by a decline in the training effect. Our analyses combined the first and second follow-up measurements of that study and compared them with the baseline measurements; we therefore found no improvement in the identification of psychosocial problems by CHPs. This implies that training has a short term effect on the quality of CHP identification, but that this effect tails off rapidly. Continued training may be needed to maintain an effect, as well as the simultaneous use of other methods to improve identification such as high quality behavior questionnaires.

Methodological strengths

Our study has certain strengths. The response rates in all 3 studies were high and each study covered the entire Netherlands as population, limiting the likelihood of selective response. Furthermore, the methodology of the 3 studies was similar. In each study,

parents completed the CBCL questionnaire and CHPs assessed and reported whether a child had psychosocial problems without knowing the answers of the parents on the CBCL questionnaire. This means it is rather unlikely that our results are biased.

We expect that our results may be generalized to other countries, especially to countries that have a similar preventive child healthcare system. Further research is needed to confirm this.

Implications

Our findings imply that nationwide interventions to improve the quality of identification of psychosocial problems by CHPs have not been effective in the long term. This study covered the period 1997-2003, but it is not likely that identification among children aged 5-6 years has improved much since then because most attempts to improve the problem identification by CHPs since 2003 have been focused on older age groups.²⁵

To improve the quality of identification by CHPs, future interventions should be more intense and last longer than the 3 days that have been evaluated before. Mild to moderate psychosocial problems are more difficult to identify than severe problems, this training should therefore particularly focus on the identification of these problems.

Next, tools for CHPs, like short questionnaires, could be improved. Previous research has shown that the questionnaires currently in use (such as the National Checklist for Indicating Psychosocial Problems in Five/Six year Olds and Strengths and Difficulties Questionnaire) indeed improve early identification but that further improvements are likely to be feasible.¹⁴

Another way of improving early identification may be to recruit other professionals to the PCH, such as behavioral scientists, to work alongside physicians and nurses. In addition, ongoing coaching and monitoring of child mental health specialists, for instance, by telephone consultation, may improve their ability to identify children with psychosocial problems at an early stage. Moreover, more time for the assessment of each child during a routine healthcare assessment may improve the quality of CHP identification. A more radical solution might be to fully replace CHPs by other types of professionals, such as psychologists. This likely would be at the expense of other requested skills, though, and is therefore less attractive. Additional nationwide interventions are needed to improve the quality of identification of psychosocial problems by CHPs, in particular the use of short questionnaires and training in their use. Moreover, as a next step after this identification, the use of longer questionnaires and consultation with mental health specialists may help to target care to those most in need. It is apparent that the second step requires the availability of sufficient time.

References

1. Brugman E, Reijneveld SA, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems by preventive child health care. *Arch Pediatr Adolesc Med.* 2001;155(4):462-469.
2. Leaf PJ, Alegria M, Cohen P, et al. Mental health service use in the community and schools: Results from the four-community MECA study. methods for the epidemiology of child and adolescent mental disorders study. *J Am Acad Child Adolesc Psychiatry.* 1996;35(7):889-897.
3. Feil E, Severson H, Walker H. Screening for emotional and behavioral delays: The early screening project. *Journal of Early Intervention.* 1998;21(3):252-265.
4. Moffitt TE, Caspi A. Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. *Dev Psychopathol.* 2001;13(2):355-375.
5. Durlak JA, Wells AM. Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *Am J Community Psychol.* 1998;26(5):775-802.
6. Geeraert L, Noortgate van den W, Grietens H, Onghena P. The effects of early prevention programs for families with young children at risk for physical child abuse and neglect: A meta-analysis. *Child Maltreat.* 2004;9(3):277-291.
7. Crone MR, Bekkema N, Wiefferink CH, Reijneveld SA. Professional identification of psychosocial problems among children from ethnic minority groups: Room for improvement. *J Pediatr.* 2010;156(2):277-284.
8. Reijneveld SA, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems among toddlers in Dutch preventive child health care. *Arch Pediatr Adolesc Med.* 2004;158(8):811-817.
9. Reijneveld SA, de Meer G., Wiefferink CH, Crone MR. Detection of child abuse by Dutch preventive child-healthcare doctors and nurses: Has it changed? *Child Abuse Negl.* 2008;32(9):831-837.
10. Costello EJ, Egger H, Angold A. 10-year research update review: The epidemiology of child and adolescent psychiatric disorders: I. methods and public health burden. *J Am Acad Child Adolesc Psychiatry.* 2005;44(10):972-986.
11. Crone MR, Vogels AG, Hoekstra F, Treffers PD, Reijneveld SA. A comparison of four scoring methods based on the parent-rated strengths and difficulties questionnaire as used in the Dutch preventive child health care system. *BMC Public Health.* 2008;8:106.

12. Reijneveld SA, Vogels AG, Hoekstra F, Crone MR. Use of the pediatric symptom checklist for the detection of psychosocial problems in preventive child healthcare. *BMC Public Health*. 2006;6:197.
13. Bouchier CAM, de Rover CM, de Vries-Lequin I, Kroesbergen HT, Visee WF, Aben DJM. Improving prevention in dutch child healthcare in schools: Development of a short questionnaire for early detection of psychosocial- and related child rearing problems. *Eur J Public Health*. 1999;9:200-204.
14. Vogels T, Reijneveld SA, Brugman E, den Hollander-Gijsman M, Verhulst FC, Verloove-Vanhorick SP. Detecting psychosocial problems among 5-6-year-old children in preventive child health care: The validity of a short questionnaire used in an assessment procedure for detecting psychosocial problems among children. *Eur J Public Health*. 2003;13(4):353-360.
15. Reijneveld SA, Vogels AG, Brugman E, van Ede J, Verhulst FC, Verloove-Vanhorick SP. Early detection of psychosocial problems in adolescents: How useful is the Dutch short indicative questionnaire (KIVPA)? *Eur J Public Health*. 2003;13(2):152-159.
16. Wiefferink CH, Reijneveld SA, de Wijs J, Swagerman M, Campman D, Paulussen TG. Screening for psychosocial problems in 5-6-year olds: A randomised controlled trial of routine health assessments. *Patient Educ Couns*. 2006;60(1):57-65.
17. Ferdinand RF, Visser JH, Hoogerheide KN, et al. Improving estimation of the prognosis of childhood psychopathology; combination of DSM-III-R/DISC diagnoses and CBCL scores. *J Child Psychol Psychiatry*. 2004;45(3):599-608.
18. Koot HM, Van Den Oord EJ, Verhulst FC, Boomsma DI. Behavioral and emotional problems in young preschoolers: Cross-cultural testing of the validity of the child behavior Checklist/2-3. *J Abnorm Child Psychol*. 1997;25(3):183-196.
19. Verhulst FC, van der Ende J, Koot HM. *Manual for the CBCL/4-18 (in Dutch)*. Rotterdam: Erasmus University/Dept of Child and Adolescent Psychiatry, Sophia Childrens' Hospital; 1996.
20. Achenbach T, Rescorla L. *Manual for the ASEBA Preschool Forms and Profiles*. Burlington: University of Vermont; 2000.
21. Reijneveld SA, Harland P, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Psychosocial problems among immigrant and non-immigrant children--ethnicity plays a role in their occurrence and identification. *Eur Child Adolesc Psychiatry*. 2005;14(3):145-152.
22. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. New York: New York University Dept of Psychology; 1988.

23. Goldstein H. *Multilevel Statistical Models*. London: Edward Arnold; 1995.
24. Goldstein H, Rasbash J, Plewis J, Draper D, Browne W, Yang M. *A User's Guide to MLwiN*. London: University of London, Multilevel Models Project; 1998.
25. Vogels AG, Crone MR, Hoekstra F, Reijneveld SA. Comparing three short questionnaires to detect psychosocial dysfunction among primary school children: A randomized method. *BMC Public Health*. 2009;9(1):489.

Chapter 3

Work experience and style explain variation among pediatricians in the detection of children with psychosocial problems

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Abstract

Objective

To assess whether variation in the proportion of children identified as having psychosocial problems by individual preventive pediatricians can be explained by pediatrician characteristics, over and above variations in the mix of children. Furthermore, to assess whether the characteristics of preventive pediatricians were related to the quality of problem identification.

Methods

We used data from approximately 3070 children ages 5 to 6 years, who were assessed during a routine well-child visit by a preventive pediatrician in the Netherlands (response rate 85.2%). We obtained data about parent-reported child problems using the Child Behavior Checklist (CBCL), sociodemographic background of the family, and characteristics of the preventive pediatrician. After each assessment, preventive pediatricians reported whether they had identified any psychosocial problem in the child. Multilevel logistic regression analyses were used to assess whether variation in the proportion of children identified by preventive pediatricians as having a psychosocial problem could be explained by the characteristics of preventive pediatricians and whether these characteristics were related to the quality of problem identification.

Results

Preventive pediatricians varied widely in the proportion of children identified as having psychosocial problems. Pediatrician characteristics such as work experience and work style (for example, on indication use of behavior questionnaires like the CBCL in routine care) explained about a quarter of this inter-pediatrician variation; child characteristics did not explain this variation even though characteristics like gender and parental education level were associated with likelihood of problem identification. More use of the CBCL and less use of the Teacher Report Form in routine care resulted in better problem identification by preventive pediatricians. Work experience was not related to a better problem identification.

Conclusions

Preventive pediatricians identify psychosocial problems in children in a standardized way, but important interpediatrician variation remains. This variation may be reduced further and quality improved by changing their work style and targeted training.

Introduction

Many children suffer from psychosocial problems, such as social-emotional and behavioral problems.^{1,2} These children are likely to experience difficulties in various aspects of their daily functioning, which may be severe and persist over time.^{3,4} Early detection and treatment may improve the prognosis of these children.^{5,6}

Community pediatric services, offering routine health care services to the population as a whole, may provide strong support in the early identification of psychosocial problems for children not yet under treatment. In the Netherlands, this early identification is a routine task for the Preventive Child Healthcare system (PCH).

Although the PCH is important for the early identification of psychosocial problems, several studies have shown a need for improvements in the identification of psychosocial problems by preventive pediatricians.^{1,7-9} Preventive pediatricians failed to identify psychosocial problems in approximately one-half the children whose parents reported serious problems on the Child Behavior Checklist (CBCL).^{1,8}

Vogels et al.¹⁰ show that the proportion of children identified as having problems, varies widely between individual preventive pediatricians. This variation could not be explained by the prevalence of problems or by differences in child background characteristics such as gender and age. However, it may be that variation between individual preventive pediatricians can be explained by preventive pediatricians characteristics. For instance, one of the predictors of the identification of psychosocial problems is whether mothers disclose concerns about their child's psychosocial functioning to the physician.¹¹ Specific aspects of physician interview style and communication skills have been shown to increase the disclosure of these concerns.^{12,13}

The aim of this study is to assess whether characteristics of preventive pediatricians explain the variation between them in the identification of children as having psychosocial problems. Furthermore, we investigated whether the characteristics of preventive pediatricians were related to better problem identification by preventive pediatricians.

Methods

A randomized controlled trial (RCT) was conducted in 2001/2002 to evaluate the effects of a training program for improving preventive pediatricians' diagnostic skills (n = 58) in a national sample of children aged 5 to 6 years (n = 7737, response 85.2%). The baseline data from the RCT were used to answer our research questions.¹⁴

Sample

The sample was obtained in a 2-stage procedure. In the first step, all PCH services in the Netherlands (at that time 43) were asked to provide preventive pediatricians for the study; 25 agreed to do so. In total, 58 preventive pediatricians varying from 1 to 6 per PCH service participated. Further information on differences between participating and other preventive pediatricians was not available. The participating preventive pediatricians were a homogenous group. They were all physicians who had the same specialization, this training (specialization) was undertaken at institute, and they had a salaried employment of the PCH service. Preventive pediatricians have obligatory Continuous Medical Education, with evaluations every five years, similar to almost all other Dutch specialized physicians. Most participating PCH services operated in a mixed area (ie a combination of urban and rural area), two services out of 25 operated in a large city. The participating services covered populations ranging from 162,000 to 760,608 in 2002.

In the second step, each of the participating preventive pediatricians had to provide a sample of 150 children ages 5 to 6 years. The sample was representative for the Dutch population.¹⁴ We included only the children who were assessed during baseline measurement periods of the RCT (ie, before the initial training of the preventive pediatricians) (n = 4007). We excluded children of non-Dutch ethnicity, that is, those with at least one parent born outside the Netherlands- from the analysis because previous research has shown that preventive pediatricians have more difficulty in identifying psychosocial problems in non-Dutch children than in Dutch children.^{7,15} We also excluded children receiving treatment for psychosocial problems, because their psychosocial problems could be expected to be known to preventive pediatricians already. We were left with a sample of 3070 children.

Measurements and procedure

The data were collected as part of the routine preventive health assessments provided regularly for all Dutch children. The parents completed the CBCL, a well-validated questionnaire about behavioral and emotional problems in the preceding 6 months.¹⁶⁻¹⁸ The CBCL comprises 120 problem items that are used to compute a Total Problems Score. We dichotomized the CBCL Total Problems Score for the analyses; children were allocated to a normal range or an elevated range, using the 90th percentile gender-specific cut-off points. The CBCL was mailed to parents with the standard invitation for the preventive health assessment. The completed CBCL was returned to the preventive pediatrician in a sealed envelope. The preventive pediatrician forwarded the envelopes to the research institute, without opening them.

The preventive pediatrician routinely examined each child; part of this examination is a

physical assessment of the child and an interview with the parents about mental health and background. The national guidelines for PCH were followed. After each assessment the preventive pediatrician answered the following question “Does the child have a psychosocial problem at this moment?” (yes or no), and scored the severity and type of problem(s) that had been identified. Preventive pediatricians generally have a time frame broader than only “at this moment”, because they identify a psychosocial problem on the basis of the interview with the parents, and parents generally refer to a longer period before the routine examination.

The preventive pediatrician recorded the sociodemographic characteristics of the child and family: child age and gender, parental educational level and employment status, and family composition. Parental educational level concerned the greatest level of education completed successfully by a parent. Family composition focused on the number of parents in the family (two parents or one parent). These child characteristics are presented in Table 1. We also obtained data about preventive pediatrician characteristics. At the start of the study, all participating preventive pediatricians completed a questionnaire about their own background. This questionnaire covered the preventive pediatrician’s age and gender, work experience, use of behavior questionnaires as aids for early detection, and previous participation in courses for the identification of psychosocial problems. Work experience was expressed as the number of years working as a preventive pediatrician. “Use of questionnaires” concerned the extent (ie, always/on indication or never) to which each preventive pediatrician used the National Checklist for Indicating Psychosocial Problems in Five/Six year old (LSPPK)¹⁹ and/or the CBCL and Teacher Report Form (TRF) during assessments.²⁰

In the Netherlands, the LSPPK is a frequently used questionnaire in PCH for detecting psychosocial problems among 5 to 6 year old children during routine examinations. In services that use the LSPPK, all parents of 5- and 6-year- olds completed the LSPPK. The LSPPK has a cut-off point that results in 8% elevated scores.¹⁹ The CBCL and TRF were sometimes used by preventive pediatricians as a diagnostic instrument during follow-up assessments (ie, only on indication in the second stage of the assessment procedure) to confirm psychosocial problems. CBCL and YSR use a cut-off point resulting in 10% of elevated scores.²¹ The questions about the use of the LSPPK, CBCL and TRF among preventive pediatricians did not refer to the study setting, but to the on-indication use in routine provision of care, that is, outside the study setting. CBCLs as filled out in the study by parents were not transferred to the preventive pediatricians concerned. All characteristics of the preventive pediatrician are presented in Table 2.

Table 1. Characteristics of the children involved in the study

	N = 3070	%*	% of whom identified as having problems	P†
Total	3070	100	26.2	
Gender				<.001
Boy	1543	50.3	30.8	
Girl	1527	49.7	21.5	
Age, Y				.75
5	2447	79.7	26.3	
6	623	20.3	25.7	
Family composition				.043
Two-parent family	2889	94.1	25.7	
One-parent family	152	5.0	34.9	
Other/unknown	29	1.0	40.0	
Parental employment				.022
At least one parent employed >16 h/week	2830	92.2	25.9	
No parent employed >16 h/week	54	1.8	42.6	
Unknown	186	6.1	26.3	
Parental educational level				<.001
Low	959	31.2	34.4	
Medium	1197	39.0	23.6	
High	889	29.0	20.2	
Unknown	25	0.8	48.0	
Elevated CBCL‡ score	286	9.3	57.7	< .001

* Percentages do not add up to 100% because of rounding off

† χ^2 test between identified problems by preventive pediatricians and characteristic of the child. Characteristics $P < .01$ were included in the multilevel models.

‡ CBCL indicates Child Behavior Checklist

Table 2. Characteristics of preventive pediatricians involved in the study

	N = 58	%*	% of children identified as having problems	P†
Gender				.06
Male	11	19.0	23.0	
Female	47	81.0	26.9	
Age, Y				< .001
24-30	8	13.8	36.7	
31-40	15	25.9	25.2	
41-50	25	43.1	23.7	
51 and older	10	17.2	23.1	
Work experience				< .001
0-5 years	18	31.0	29.8	
6-10 years	3	5.2	29.8	
11-15 years	13	22.4	26.1	
16-20 years	13	22.4	23.1	
21 years or more	11	19.0	22.6	
Participation in previous courses on early detection of psychosocial problems				.19
Within the last 5 years	30	51.7	26.7	
More than 5 years ago	8	13.8	23.1	
Did not participate in courses	18	31.0	27.1	
Unknown	2	3.4	20.3	
On indication use of the CBCL‡				< .001
Never	31	53.4	27.4	
Always/on indication	13	22.4	18.5	
Unknown	14	24.1	30.5	
Use of the LSPPK for universal screening‡				< .001
Never	23	39.7	22.5	
Always/on indication	27	46.4	29.7	
Unknown	8	13.8	24.8	
On indication use of the TRF‡				< .001
Never	34	58.6	26.1	
Always/on indication	10	17.2	19.8	
Unknown	14	24.1	30.1	
Percentages of children of non-Dutch ethnicity				.027∞
1-20%	44	75.9	25.5	
21-40%	12	20.7	30.4	
41-100%	2	3.4	22.2	

* Percentages do not add up to 100% because of rounding off

† χ^2 test between identified problems by preventive pediatrician and characteristics of the pediatrician. Characteristics $P < .01$ were included in the multilevel models.

‡ CBCL indicates Child Behavior Checklist; LSPPK, National Checklist for indicating Psychosocial Problems in Five/six year old; TRF, Teacher's Report Form

∞ We limited χ^2 test to the categories 1-20% and 21-40% because of the small numbers in the category 41-100% ($n < 5$).

Analysis

First, we assessed whether the variation in the proportion of children identified as having problems by individual preventive pediatricians were larger than might be expected on the basis of a normal distribution using a χ^2 test.

Second, we assessed the extent to which this enlarged variation could be explained by CBCL score, preventive pediatrician characteristics and child characteristics. The preventive pediatrician and child characteristics assessed in this way are presented in Table 1. Multilevel techniques were used to assess the degree to which the proportion of children identified as having problems varied by preventive pediatricians, using MLWin 2.02.^{22,23} We computed 2 measures for preventive pediatrician level-variance, the intraclass correlation (ICC) and the median odds ratio (MOR).²⁴ The ICC expresses the proportion of variance in the outcome that is attributable to the preventive pediatrician. Its meaning in multilevel logistic regression is limited, however, because its value also depends on the prevalence of the outcome. The MOR is the median value of the odds ratio between the preventive pediatrician with a higher and a lower proportion of children identified as having problems when two preventive pediatricians are selected at random. It shows the extent to which the preventive pediatrician determines the probability per child of being identified as having psychosocial problems.

We performed multilevel logistic regression analyses by using 5 sequential models. The first model assessed only the degree to which the proportion of children being identified as having problems varied by preventive pediatrician. The CBCL score was added as a predictor in model 2. In models 3 and 4, respectively, we added characteristics of preventive pediatricians and sociodemographic characteristics of the child as predictors to the analyses. Only the characteristics that showed a significant relationship with the identification of problems by preventive pediatricians ($P < .01$) were included in the final multilevel models (models 3, 4, and 5).

To investigate whether the characteristics of preventive pediatricians were related to a better problem identification by preventive pediatricians, we added in model 5 the degree to which the significant preventive pediatrician characteristics (as identified in model 4) strengthened the association of identification with parent-reported CBCL score. A greater concordance between elevated CBCL scores and identification by preventive pediatricians is further identified as "better problem identification by preventive pediatricians".

To investigate whether the predictors explained variation between the individual preventive pediatricians, we assessed the extent of the remaining differences between preventive pediatricians in each model, by using the ICC and the MOR. Finally, we repeated the multilevel analyses (model 1 to 5) in the subgroup of children that preventive

pediatricians had identified as having moderate or severe problems to investigate whether the results are similar for this subgroup.

Results

Characteristics of children and preventive pediatricians

The number of children examined by each individual preventive pediatrician varied between 8 and 95, with a mean of 52.9. In total, 26.2% of all children were identified as having a psychosocial problem. Figure 1 shows that this proportion varied widely between individual preventive pediatricians. This variation was significantly larger than could be expected on the basis of chance alone (Pearson $\chi^2 = 270$ [57], $P < .01$).

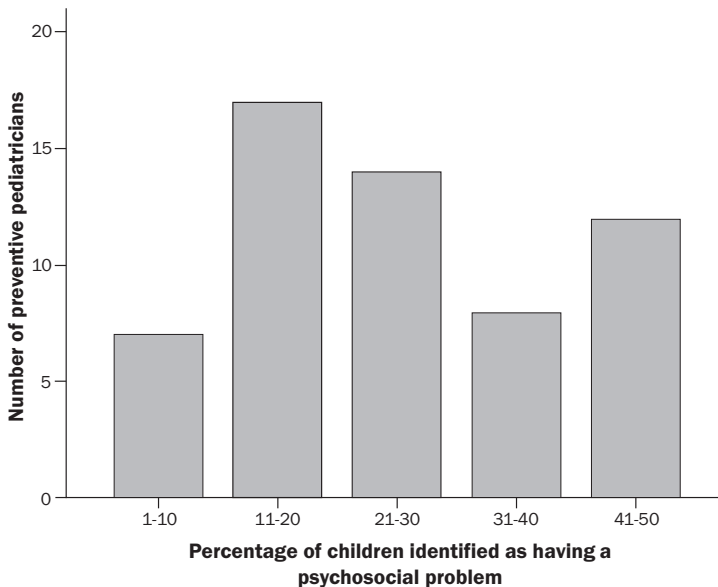


Figure 1. Number of preventive pediatricians by proportion of children identified as having a psychosocial problem

Table 2 shows that 19% of the preventive pediatricians were males. Fourteen percent of the preventive pediatricians were 24 to 30 years of age, 26% were 31 to 40 years of age, 43% were 41 to 50 years of age and 17% was 51 years or older. Nearly two-thirds of the preventive pediatricians had 11 or more years working experience.

Variation among preventive pediatricians explained by CBCL score, preventive pediatrician characteristics and other child characteristics

We first assessed the degree to which the proportion of children identified as having problems varied by preventive pediatrician and found that the ICC and the MOR were 0.099 and 1.77, respectively. The MOR value indicates that when 2 preventive pediatricians are selected at random, the odds that one of them identifies children with psychosocial problems are on average 77% greater than for the other.

Table 3 presents the results of the subsequent models. CBCL score was significantly related to problem identification by preventive pediatricians (model 2). However, the variation between preventive pediatricians cannot be explained by CBCL score; the proportion of variation between preventive pediatricians did not decrease (MOR = 1.84).

In model 3 we added preventive pediatrician characteristics as predictors. The results of this model showed that most preventive pediatrician characteristics were significantly related to problem identification by preventive pediatrician ($P < .01$), except for preventive pediatrician age and the use of the LSPPK. The MOR indices decrease from 1.84 to 1.61, indicating that preventive pediatrician characteristics explain about a quarter of the inter-pediatrician variation.

In model 4 we added sociodemographic characteristics of the child. The results showed that these characteristics were significantly related to problem identification by preventive pediatricians. However, their inclusion did not reduce inter-pediatrician variation (MOR = 1.64). In other words; sociodemographic characteristics of the child cannot explain the variation between preventive pediatricians.

Table 3. Multilevel logistic regression analysis with problem identified by preventive pediatrician as the outcome variable and CBCL score (model 2) plus preventive pediatrician characteristics (model 3) plus sociodemographic background of the child (model 4) as the independent variables (N = 3070)

	Crude	Model 2	Model 3	Model 4
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
CBCL score				
Elevated vs. normal	4.68 (3.63-6.04)*	4.68 (3.63-6.04)*	5.02 (3.87-6.51)*	5.09 (3.90-6.65)*
Preventive pediatrician characteristics				
Age,Y				
24-30	1.00 (reference)		1.00 (reference)	1.00 (reference)
31-40	0.61 (0.40-0.92)*		0.70 (0.45-1.10)	0.74 (0.47-1.18)
41-50	0.55 (0.37-0.81)*		1.12 (0.51-2.46)	1.28 (0.56-2.88)
>50	0.53 (0.32-0.87)*		0.99 (0.42-2.36)	1.13 (0.46-2.75)
Work experience				
0-5	1.00 (reference)		1.00 (reference)	1.00 (reference)
6-10	0.90 (0.46-1.78)		2.30 (1.04-5.06)*	2.21 (0.98-4.99)
11-15	0.82 (0.55-1.22)		0.80 (0.43-1.52)	0.79 (0.41-1.52)
16-20	0.71 (0.48-1.07)		0.49 (0.23-1.05)	0.49 (0.22-1.07)
>=21	0.67 (0.46-0.99)*		0.42 (0.19-0.91)*	0.37 (0.17-0.84)*
Use of CBCL				
Never	1.00 (reference)		1.00 (reference)	1.00 (reference)
Always/on indication	0.59 (0.41-0.84)*		0.25 (0.11-0.54)*	0.27 (0.12-0.60)*
Unknown	1.17 (0.83-1.65)		0.37 (0.11-1.26)	0.39 (0.11-1.36)
Use of LSPPK				
Never	1.00 (reference)		1.00 (reference)	1.00 (reference)
Always/on indication	1.39 (1.03-1.89)*		1.37 (0.99-1.89)	1.32 (0.95-1.85)
Unknown	1.16 (0.74-1.84)		1.05 (0.63-1.76)	1.01 (0.55-1.84)
Use of TRF				
Never	1.00 (reference)		1.00 (reference)	1.00 (reference)
Always/on indication	0.68 (0.44-1.03)		2.59 (1.09-6.15)*	2.19 (0.90-5.35)
Unknown	1.26 (0.89-1.77)		3.90 (1.20-12.71)*	3.61 (1.07-12.18)*
Sociodemographic characteristics of child				
Gender				
Girl v. boy	0.61 (0.51-0.72)*			0.56 (0.47-0.67)*
Parental educational level				
Low	1.00 (reference)			1.00 (reference)
Medium	0.62 (0.51-0.75)*			0.64 (0.53-0.79)*
High	0.51 (0.41-0.64)*			0.54 (0.42-0.68)*
Unknown	1.97 (0.87-4.47)			1.73 (0.73-4.12)
ICC		0.112	0.071	0.077
MOR		1.84	1.61	1.64

CBCL = Child Behavior Checklist; OR= odds ratio; CI = confidence interval; LSPPK = National Checklist for indicating Psychosocial Problems in Five/six year old; TRF = Teacher's Report Form; ICC = intraclass correlation; MOR = Median odds ratio.

Model 1 calculated only the effect of the identity of preventive pediatrician as a level 2 factor, ICC = 0.099 and MOR = 1.77

* $P < .05$

In model 5, we added the degree to which significant preventive pediatrician characteristics as identified in model 4 (ie, work experience, on indication-use of CBCL and TRF) strengthened the association of identification with CBCL score. The results of this model showed that more use of the CBCL (odds ratio [OR]= 3.04 (95% confidence interval [95% CI] 1.13-8.20), $P < .05$) and less use of the TRF (OR 0.41; 95% CI 0.15-1.11; $P < .10$) results in a better problem identification by preventive pediatricians. Work experience was not related to a better problem identification by preventive pediatricians (OR 0.94; 95% CI 0.77-1.15; $P = .57$; not shown).

The results were similar in the subgroup of children that preventive pediatricians had identified as having moderate or severe problems.

Discussion

This study shows that preventive pediatricians vary widely in the proportion of children they identify as having psychosocial problems. When 2 preventive pediatricians are selected at random, the odds that one of them identifies children with psychosocial problems is on average 84% greater than for the other when the prevalence of parent-reported problems is equal. Preventive pediatrician characteristics such as work experience (ie, number of years working) and use of behavior questionnaires (ie, use of CBCL and TRF) explain approximately one-quarter of this inter-pediatrician variation, indicated by a decrease in MOR when these characteristics were added to the model. The occurrence of problems (measured by CBCL score) and background of the child do not have any effect on the inter-pediatrician variation, that is, variations in the mix of children that they assess did not explain variation between pediatricians.

The extent of the inter-pediatrician variation in early identification can be considered to be relatively large. A MOR of 1.84 is much larger than acceptable for clinical tests, even though the assessment of psychosocial problems is much more complex than such tests. However, a MOR of 1.84 is much smaller than the OR for an elevated CBCL of 4.68. Seen from this perspective, inter-pediatrician variation is quite small compared with an indicator of the quality of the early identification. The performance of these preventive pediatricians in routine practice should be improved, however. Preventive pediatricians failed to identify psychosocial problems in about half the children whose parents reported serious problems on the CBCL. The latter implies that further containment of inter-pediatrician variation is necessary, evidently aiming at an increase of the overall quality of identification.

We found that child characteristics did not explain the inter-pediatrician variation in the identification of psychosocial problems, whereas preventive pediatrician characteristics did. Regarding child characteristics, this confirms the findings of Vogels et al,¹⁰ who investigated the influence of these characteristics on inter-pediatrician variation in older children. Regarding preventive pediatricians characteristics, we were the first to investigate the influence of these characteristics on inter-pediatrician variation in the identification of children with psychosocial problems. Our findings show that the use of additional diagnostic tools like the CBCL and TRF explained some inter-pediatrician variation. The same holds for the number of years worked. The lack of an effect of the preventive pediatrician age also shows that this is not just due to ageing.

Furthermore, our findings show that on-indication use of the CBCL is related to an improved problem identification by preventive pediatricians. Interventions to improve identification by preventive pediatricians might be in particular targeted at this factor and also at the methodical working style for which it stands. Less on- indication use of the teacher-reported TRF is associated with a better problem identification by preventive pediatricians. This finding is not surprising because the TRF is completed by the teacher whereas we used parent-information to determine the quality of identification by the preventive pediatricians. Information from a different informant, the teacher, may then lead to a weakening of the association of the preventive pediatrician's identification with parent-report but have added value despite this issue.

A considerable part of inter-pediatrician variation persisted after adjustment for their preventive pediatrician characteristics, which may indicate that other factors, not included in our study, also account for differences between preventive pediatricians. Evidence shows that practice factors have a major impact on communications between physicians and families.²⁵ For instance, practices with outcome measurements and practices that are rewarded on the basis of quality or performance all improve their processes including identification. The contribution of these contextual factors to inter-pediatrician variation in the identification of psychosocial problems therefore deserves further study.

Preventive pediatricians identified 26.2% of all children as having psychosocial problems, a similar rate as in previous studies.¹ This rate is much greater than the prevalence of psychosocial problems, measured by an elevated score on the CBCL (9.3%). The latter prevalence should be interpreted with caution because we used CBCL cut-off points based on the 90th percentile. Several reasons may explain these different prevalence rates. First preventive pediatricians also identify children with mild problems because these children may benefit most from the relatively light interventions that are offered in primary care settings. Another explanation may be that some children are falsely identified as having

psychosocial problems by preventive pediatricians. This may also relate to our finding that more experienced preventive pediatrician identified fewer cases.

Strengths and limitations

Our study had a number of strengths. The response rate in this study was high and the sample covered the entire Netherlands as a population, limiting the likelihood of selective response. Furthermore, we analyzed data for children who were assessed during routine practice, limiting the likelihood of biased results.

Three methodological limitations may have affected our findings. First, children with non-Dutch ethnicity were not included in our analysis, because previous research has shown that preventive pediatricians have more difficulty in identifying psychosocial problems in non-Dutch children than in Dutch children.^{15,26} We therefore expect variation between preventive pediatricians in the identification of psychosocial problems to be even larger when children of non-Dutch ethnicity are involved.

Second, although data collection was performed in the context of routine care, preventive pediatricians who participated in this study may be on average more interested in the identification of children with psychosocial problems. In addition, a Hawthorne effect may cause preventive pediatricians who participated in this study to modify an aspect of their behavior because they knew that their performance was studied. Both factors may cause our study to underestimate the size of inter-pediatrician variation.

Third, we used the CBCL as golden standard in determining quality of identification but this only provides parent-information, whereas preventive pediatricians identification is also based on the child and on information from colleagues observing the same child. Moreover, the CBCL mostly targets at severe problems, whereas preventive pediatricians also target at mild problems. Both factors will lead to an underestimation of the quality of identification in this study.

Implications

Preventive pediatricians seem to be able to identify psychosocial problems in children in a standardized way, although important inter-pediatrician variation remains. Our findings show that the use of high-quality questionnaires as included in our regression model reduces inter-pediatrician variation, and it is likely that these questionnaires improve overall quality.^{27,28} It is rather likely that the use of high-quality questionnaires is a proxy for methodical working and that this reduces inter-pediatrician variation. If true, this implies that methodical working should be enhanced by, for instance, increased use of high quality questionnaires, in particular of short ones such as the SDQ or PSC.^{27,28} This may

require additional training, and also an extension of the time that is available per visit. Second, our findings show that number of years worked explains some inter-pediatrician variation. The acquisition of the underlying physician skills may be accelerated in several ways, for instance by on-the-job coaching for preventive pediatricians and by training preventive pediatricians in the use of guidelines. The latter has indeed been found to enhance the quality of problem identification,¹⁴ even though this effect extinguished rather rapidly. The latter shows that continuous efforts are needed to attain a lasting improvement in the identification of psychosocial problems, which should preferably be imbedded in the entire work process of the PCH. Moreover, in general, our findings show the importance of certain factors regarding inter-pediatrician variation in identification. Interventions to improve the identification by preventive pediatricians might be in particular targeted at those factors. However, their effectiveness requires additional study. In conclusion, preventive pediatricians seem to be able to identify psychosocial problems in children with a substantial degree of standardization. Despite this, further improvement seems to be attainable.

References

1. Brugman E, Reijneveld SA, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems by preventive child health care. *Arch Pediatr Adolesc Med.* 2001;155(4):462-469.
2. Leaf PJ, Alegria M, Cohen P, et al. Mental health service use in the community and schools: Results from the four-community MECA study. methods for the epidemiology of child and adolescent mental disorders study. *J Am Acad Child Adolesc Psychiatry.* 1996;35(7):889-897.
3. Feil E, Severson H, Walker H. Screening for emotional and behavioral delays: The early screening project. *Journal of Early Intervention.* 1998;21(3):252-265.
4. Moffitt TE, Caspi A. Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. *Dev Psychopathol.* 2001;13(2):355-375.
5. Durlak JA, Wells AM. Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *Am J Community Psychol.* 1998;26(5):775-802.
6. Geeraert L, Noortgate van den W, Grietens H, Onghena P. The effects of early prevention programs for families with young children at risk for physical child abuse and neglect: A meta-analysis. *Child Maltreat.* 2004;9(3):277-291.
7. Crone MR, Bekkema N, Wiefferink CH, Reijneveld SA. Professional identification of psychosocial problems among children from ethnic minority groups: Room for improvement. *J Pediatr.* 2010;156(2):277-284.
8. Reijneveld SA, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems among toddlers in Dutch preventive child health care. *Arch Pediatr Adolesc Med.* 2004;158(8):811-817.
9. Reijneveld SA, de Meer G., Wiefferink CH, Crone MR. Detection of child abuse by Dutch preventive child-healthcare doctors and nurses: Has it changed? *Child Abuse Negl.* 2008;32(9):831-837.
10. Vogels AG, Jacobusse GW, Hoekstra F, Brugman E, Crone M, Reijneveld SA. Identification of children with psychosocial problems differed between preventive child health care professionals. *J Clin Epidemiol.* 2008;61(11):1144-1151.
11. Wildman BG, Stancin T, Golden C, Yerkey T. Maternal distress, child behaviour, and disclosure of psychosocial concerns to a paediatrician. *Child Care Health Dev.* 2004;30(4):385-394.

12. Wissow LS, Roter DL, Wilson ME. Pediatrician interview style and mothers' disclosure of psychosocial issues. *Pediatrics*. 1994;93(2):289-295.
13. Wissow LS, Larson S, Anderson J, Hadjiisky E. Pediatric residents' responses that discourage discussion of psychosocial problems in primary care. *Pediatrics*. 2005;115(6):1569-1578.
14. Wiefferink CH, Reijneveld SA, de Wijs J, Swagerman M, Campman D, Paulussen TG. Screening for psychosocial problems in 5-6-year olds: A randomised controlled trial of routine health assessments. *Patient Educ Couns*. 2006;60(1):57-65.
15. Reijneveld SA, Harland P, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Psychosocial problems among immigrant and non-immigrant children--ethnicity plays a role in their occurrence and identification. *Eur Child Adolesc Psychiatry*. 2005;14(3):145-152.
16. Ferdinand RF, Visser JH, Hoogerheide KN, et al. Improving estimation of the prognosis of childhood psychopathology; combination of DSM-III-R/DISC diagnoses and CBCL scores. *J Child Psychol Psychiatry*. 2004;45(3):599-608.
17. Koot HM, Van Den Oord EJ, Verhulst FC, Boomsma DI. Behavioral and emotional problems in young preschoolers: Cross-cultural testing of the validity of the child behavior Checklist/2-3. *J Abnorm Child Psychol*. 1997;25(3):183-196.
18. Verhulst FC, van der Ende J, Koot HM. *Manual for the CBCL/4-18 (in Dutch)*. Rotterdam: Erasmus University/Dept of Child and Adolescent Psychiatry, Sophia Childrens' Hospital; 1996.
19. Vogels T, Reijneveld SA, Brugman E, den Hollander-Gijsman M, Verhulst FC, Verloove-Vanhorick SP. Detecting psychosocial problems among 5-6-year-old children in preventive child health care: The validity of a short questionnaire used in an assessment procedure for detecting psychosocial problems among children. *Eur J Public Health*. 2003;13(4):353-360.
20. Achenbach T, Rescorla L. *Manual for the ASEBA school-age forms & profiles*. Burlington: University of Vermont; 2001.
21. Achenbach TM. *Manual for the child behavior checklist/4-18 and 1991 profile*. Burlington: Department of Psychiatry, University of Vermont; 1991.
22. Goldstein H. *Multilevel statistical models*. London: Edward Arnold; 1995.
23. Goldstein H, Rasbash J, Plewis J, Draper D, Browne W, Yang M. *A user's guide to MLwiN*. London: University of London, Multilevel Models Project; 1998.
24. Merlo J, Chaix B, Ohlsson H, et al. A brief conceptual tutorial of multilevel analysis in social epidemiology: Using measures of clustering in multilevel logistic regression to investigate contextual phenomena. *J Epidemiol Community Health*. 2006;60(4):290-297.

25. Wissow L, Anthony B, Brown J, et al. A common factors approach to improving the mental health capacity of pediatric primary care. *Adm Policy Ment Health*. 2008;35(4):305-318.
26. Klein Velderman M, Crone MR, Wiefferink CH, Reijneveld SA. Identification and management of psychosocial problems among toddlers by preventive child health care professionals. *Eur J Public Health*. 2010;20(3):332-338.
27. Reijneveld SA, Vogels AG, Hoekstra F, Crone MR. Use of the pediatric symptom checklist for the detection of psychosocial problems in preventive child healthcare. *BMC Public Health*. 2006;6:197.
28. Vogels AG, Crone MR, Hoekstra F, Reijneveld SA. Comparing three short questionnaires to detect psychosocial dysfunction among primary school children: A randomized method. *BMC Public Health*. 2009;9(1):489.

Chapter 4

Three questionnaires to detect psychosocial problems in toddlers: a comparison of the BITSEA, ASQ:SE and KIPPPI

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Submitted

Abstract

Background

Validated questionnaires can improve the identification of psychosocial problems in community pediatric services. Our aim was to assess which of three short questionnaires, the BITSEA, ASQ:SE, and a Dutch list named KIPPPPI, was most suitable as a routine screening tool for identification among toddlers.

Methods

We included 2,106 parents (response 81%) of children aged 6, 14 or 24 months at routine well-child visits in 18 services across the Netherlands. Child healthcare professionals interviewed and examined children and parents. Parents were randomized to complete either the BITSEA or the KIPPPPI; all filled out the ASQ:SE and the CBCL. Of each questionnaire, we assessed the internal consistency, the validity with CBCL-Total Problems Score (CBCL-TPS) as criterion, and added value to identification compared to clinical assessment alone.

Results

Cronbach 's alphas of the total scales varied between 0.46 to 0.91. At the ages of 6 and 14 months none of the instruments studied had adequate validity. At the age of 24 months, only the BITSEA discriminated sufficiently between children with and without problems (sensitivity = 0.84 at specificity = 0.90), but not the other two questionnaires (with sensitivity indices varying between 0.53-0.60 at similar specificity). The BITSEA at this age offered slightly higher added value to the identification of psychosocial problems by CHPs.

Conclusions

For toddlers aged 6 and 14 months, no questionnaire is sufficiently valid to support the identification of psychosocial problems. The BITSEA is the best short tool for the early detection of psychosocial problems in 2 years old children.

Introduction

Timely and accurate identification of young children with socio-emotional and behavioral problems is critical.^{1,2} Children with psychosocial problems are likely to experience difficulties in various aspects of their daily functioning. Such problems may be severe and persist over time.³ Early detection and treatment can improve the prognosis for psychosocial problems in children.^{4,5}

Community pediatric services are important for the early identification of psychosocial problems in children because they offer routine health care services to the population as a whole. In the Netherlands, Child Healthcare Professionals (CHPs) routinely offer preventive health care to all children aged 0-19 years, similar to well-child care in the USA. Research has showed that CHPs missed psychosocial problems in about half the children with parent-reported problems on the Child Behavior Checklist (CBCL) when using a clinical assessment, but also identified problems in children without such scores.⁶ Validated questionnaires can improve the identification of psychosocial problems by community pediatric services.⁷ To be suitable for this, such questionnaires have to be reliable and valid, but also short and easy to use. That implies that the CBCL, even though being highly reliable and valid,⁸ is too long to be used as a routine screening tool. For school-aged children the Strengths and Difficulties Questionnaire (SDQ)^{9,10} is an appropriate assessment. Evidence on screening instruments for preschool children is scarce.

In this study we compared three short parent-report questionnaires aiming at psychosocial problems of preschool children: the BITSEA, ASQ:SE and the KIPPPI. BITSEA is an acronym for the *Brief Infant Toddler Social Emotional Assessment* and provides a first indication of emotional, behavioral problems, developmental delay and competences in children between 12 and 36 months old. The BITSEA is validated in the United States^{2,3,11} and also examined in Finland¹² and Turkey¹³. The psychometric properties of the *Ages and Stages questionnaires: Social-Emotional* ASQ:SE have been shown to be good in the USA.¹⁴ Sensitivity and specificity (with CBCL-TPS as criterion) of a Korean translation of the ASQ:SE were moderate at the age of 18 and 24 months, but at the age of 6 and 12 months the sensitivity indices of the ASQ:SE were much lower. Evidence on the psychometric properties of the Dutch version of the ASQ:SE is lacking. The KIPPPI is a Dutch questionnaire, the acronym standing for “short instrument for the psychological and pedagogical inventory”.^{15,16} This instrument is currently used in many Dutch community pediatric services, but no psychometric properties have been reported.

The aim of this study was to compare the psychometric properties (internal consistency and validity) and the added value of these questionnaires, ie whether they add to the

identification of psychosocial problems based on only clinical judgment among 6 to 24 months old children.

Methods

Sample and procedure

The sample was obtained in a two-stage procedure. In the first step, all community pediatric services in the Netherlands were asked to participate in the study. Eighteen services, located throughout the country, agreed to participate. Each service was asked to provide a random sample of children aged 6, 14 and 24 months who were invited for well-child examinations that are provided to all children routinely. A total of 3,386 parents were asked to participate in this study; 10.1% (n = 342) refused to participate. Moreover, 9.0% (n = 292) did not provide complete data, resulting in study sample of 2,752 parents (81%). Because we needed in the 6- and 14- months old children a follow-up measurement to assess the CBCL at the age of 18 months, we lost another 19% of the parents (n = 646). Complete data were collected for 2,106 parents and their children.

Procedure and measurements

The data were collected during the routine well-child examinations, between August 2008 and June 2011. The CBCL/1.5-5 and the ASQ:SE and either the BITSEA or the KIPPI were mailed to parents along with the standard invitation for the well-child visit and filled in at home. The completed questionnaires were returned to the CHP in a sealed envelope and forwarded to the research institute without being opened. The CHP then took a routine history and physically assessed each child before answering the following questions: "Does the child have a psychosocial problem at this moment?" (yes or no) and "Does the child currently receive treatment for psychosocial problems?". The CHP also provided data about child age and gender, ethnic background, family composition, parental employment and educational level, number of siblings, and maternal and paternal age. The parental educational level was the highest level of education completed successfully by a parent. Family composition focused on the number of parents in the family (two parents or one parent). The CHPs recorded these background characteristics during the assessment. The CBCL (1.5-5) Total Problems Score (TPS) was used as criterion for the occurrence of psychosocial problems. The CBCL assesses parental reports about children's behavioral and emotional problems in the preceding two months. Its reliability and validity have been found to be sound, also in the Netherlands.^{8,17,18} The CBCL comprises 99 problem items that

are used to compute Total, Internalizing and Externalizing problem scores. Children were allocated to a normal range or an elevated range using the 90th percentile cut-off point. Because the CBCL aims at children older than 18 months, parents of the children in the youngest age groups (6 and 14 months) were asked to complete the CBCL at older ages: 18 months for 6-months old babies, and 2 years for 14 months old toddlers .

The *BITSEA* consists of a selection of 42 items from the 166 items of the *ITSEA*. All items are rated on a three point scale: (0) not true/rare, (1) almost true/sometimes, (2) completely true/often, leading to two scales: a Problems Scale (31 items) and a Competence Scale (11 items).¹¹

The *ASQ:SE* was developed in the USA as a complement to the *Ages and Stages Questionnaires (ASQ)*, a general developmental screening tool for children.^{14,19} The *ASQ:SE* addresses the social and emotional behavior of children from ages 3 to 66 months. We used the versions for children of 6 months (22 items), 12 months (25 items), and 24 months (29 items).¹⁹ Each item has to be scored on a 3-point scale (0 = “never or rarely”, 5 = “sometime” and 10 = “most of the time”). An additional 5 points are given for items where parents indicate that the behavior is of concern to them. Scores for each item are then combined into a total score. No official Dutch versions of the *ASQ:SE* forms were available. Therefore, these questionnaires were translated following a procedure advised by Guillemin, using three native language translators and independent back-translators.²⁰

The *KIPPPI* is a parent-completed Dutch questionnaire on children’s social emotional development, well-being and behavior, designed specifically for Dutch PCH.¹⁵ For the children of 6 and 14 months we used a version that contains 76 items; each item has to be scored on a 4-point scale (1 = “almost never”, 2 = “sometimes” 3 = “often” and 4 = “almost always”). These items allow for the calculation of three subscales (Well-being, Resilience, Social Well-being) and a total problem scale. For the 24 months old children we used a version containing 70 items that can be combined into three subscales: Well-being, Competence, and Autonomy.

Randomization

We used a previously developed procedure⁷ to compare the three questionnaires (*KIPPPI*, *ASQ:SE* and *BITSEA*). To guarantee complete equivalence of data, we randomized parents of children to fill out either the *BITSEA* or the *KIPPPI*, and always the *ASQ:SE* and the *CBCL*. We did so in order to prevent the set of questionnaires to become too long. This resulted in two subsamples: the first sample completed the *CBCL*, *ASQ:SE* and the *BITSEA*, the other sample completed the *CBCL*, *ASQ:SE* and the *KIPPPI*. The two sub-samples did not differ regarding background characteristics.

Analysis

We first assessed background characteristics of the sample. Next, we assessed the internal consistency using Cronbach's alpha. Third, we assessed the validity of each instrument with sensitivity and specificity indices, using CBCL-Total Problems Scale (CBCL-TPS). Cohen's kappas and Spearman correlation coefficients are presented as measures of concordance between each instrument and the CBCL-TPS criterion.

Finally, to examine the added value of the instruments to the identification of psychosocial problems, we assessed the degree to which each instrument could improve the identification of children with problems based solely on clinical assessment by the CHP without knowledge of the instrument. Logistic regression analyses were performed for each instrument with the CBCL-TPS criterion measures as the dependent variable. In the first step the identification by a CHP was included in the analyses and in the second step the dichotomized score on the instrument was added as an independent variable.

No established cut-off point were available for KIPPP1 1-4 and the Dutch version of the BITSEA and the ASQ:SE. We therefore chose as appropriate cut-off point the score that was associated with a specificity of at least 0.90 in our sample, using an elevated CBCL-TPS as criterion.

Results

Background characteristics

Background characteristics are presented in Table 1.

Table 1. Demographic characteristics of the participating children

	6 months: (n = 396)	14 months (n = 801)	24 months (n = 840)
	n (%)	n (%)	n (%)
Child's sex			
Boy	202 (51.0)	420 (52.6)	425 (50.6)
Girl	194 (49.0)	378 (47.4)	415 (49.4)
Child's age			
< 3 months than target age	3 (0.8)	3 (0.4)	11 (1.3)
Between 3 - 4 months from target age	390 (98.5)	786 (99.4)	802 (97.0)
> 4 months than target age	3 (0.8)	2 (0.3)	14 (1.7)
Ethnicity			
Dutch	351 (89.5)	532 (91.4)	724 (88.4)
Surinam/Antillean	5 (1.3)	4 (0.7)	17 (2.1)
Turkish/Moroccan	11 (2.8)	15 (2.6)	23 (2.8)
Immigrant non-western country	14 (3.6)	16 (2.7)	32 (3.9)
Immigrant another western country	11 (2.8)	15 (2.6)	23 (2.8)
Family situation			
Two-parent family	380 (98.4)	562 (98.4)	775 (97.4)
One-parent family	6 (1.6)	9 (1.6)	21 (2.6)
Economical context			
No job	3 (0.8)	3 (0.5)	9 (1.9)
Fulltime earner	59 (15.4)	80 (14.3)	130 (20.5)
Fulltime-parttime	273 (71.1)	403 (71.8)	532 (65.2)
Parttime-pattime	38 (9.9)	55 (9.8)	73 (9.5)
Dual earners	10 (2.6)	20 (3.6)	29 (2.9)
Highest educational level mother			
Low (primary school)	25 (6.4)	40 (6.9)	81 (9.9)
Mediate (secondary school)	150 (38.4)	236 (40.5)	312 (39.0)
High (higher education and university)	216 (55.2)	306 (52.6)	429 (52.2)
Siblings			
No siblings	201 (50.8)	287 (35.8)	324 (38.6)
1 sibling	138 (34.8)	421 (52.6)	353 (42.0)
2 or more siblings	57 (14.4)	93 (11.6)	163 (19.4)
Psychosocial problems			
Under treatment	4 (1.0)	4 (0.5)	11 (1.3)
Elevated CBCL-TPS	36 (9.1)	82 (9.8)	82 (9.8)
CHP identifies a psychosocial problem	13 (3.3)	34 (4.2)	95 (11.6)

Internal consistency

Table 2 presents internal consistencies of the scores on the total problems scales of the BITSEA, KIPPPPI and ASQ:SE at 6, 14 and 24 months, and on the subscales of the former two ones. The ASQ:SE has no subscales. Internal consistencies of the total problems score of the BITSEA and the KIPPPPI were satisfactory, but low for the ASQ:SE (alphas from 0.46 at 6 months to 0.66 at 14 months).

Table 2. Internal consistency of KIPPPPI, ASQ:SE and BITSEA, Total scale and subscales

	Number of items	Cronbach's alpha
KIPPPPI		
6 months		
Total difficulties	76	0.91
Wellbeing	14	0.59
Resilience	43	0.90
Social	19	0.84
14 months		
Total difficulties	76	0.90
Wellbeing	14	0.68
Resilience	43	0.88
Social	19	0.82
24 months		
Total difficulties	70	0.89
Wellbeing	32	0.86
Competence	28	0.81
Autonomy	10	0.42
ASQ:SE		
6 months		
Total difficulties	19	0.46
14 months		
Total difficulties	35	0.66
24 months		
Total difficulties	26	0.62
BITSEA		
14 months		
Problems	31	0.79
Competence	11	0.68
24 months		
Problems	31	0.80
Competence	11	0.66

Validity

Table 3 presents data on the validity of the three questionnaires, using an elevated CBCL-TPS as criterion. The KIPPPPI, ASQ:SE and BITSEA, and the scores correlated moderately, but significantly with the CBCL scores. Table 3 also presents Cohen's kappas, sensitivity

and specificity indices for both criteria. As a result of the way we determined the cutoff point, all specificity indices in Table 3 were 0.90 or higher. For the two youngest age groups (6 and 14 months), the sensitivity indices varied between 0.25 (for the KIPPPI at 6 months) to 0.56 (for BITSEA at 14 months). At the age of 24 months, the BITSEA showed a satisfactory sensitivity (0.84), at a specificity of 0.91. The sensitivity of the two other questionnaires at 24 months was lower: 0.53 for the KIPPPI and 0.63 for the ASQ:SE.

Table 3. Test characteristics of the KIPPPI, ASQ:SE, and BITSEA using elevated CBCL-TPS score as criterion

	6 months ¹	14 months ²	24 months
KIPPPI			
Spearman's rho	0.41	0.37	0.69
Kappa	0.14	0.16	0.40
Sensitivity (95% CI)	0.25 (0.13 - 0.43)	0.27 (0.15 - 0.43)	0.53 (0.38 - 0.68)
Specificity (95% CI)	0.90 (0.86 - 0.93)	0.90 (0.86 - 0.93)	0.91 (0.87 - 0.94)
AUC (95% CI)	0.75 (0.67 - 0.83)	0.82 (0.76 - 0.87)	0.85 (0.79 - 0.91)
ASQ:SE			
Spearman's rho	0.32	0.35	0.59
Kappa	0.21	0.25	0.47
Sensitivity (95% CI)	0.28 (0.15 - 0.45)	0.38 (0.27 - 0.50)	0.66 (0.55 - 0.76)
Specificity (95% CI)	0.93 (0.90 - 0.95)	0.91 (0.89 - 0.93)	0.91 (0.89 - 0.93)
AUC (95% CI)	0.72 (0.63 - 0.82)	0.75 (0.69 - 0.81)	0.88 (0.85 - 0.92)
BITSEA			
Spearman's rho		0.48	0.71
Kappa		0.38	0.55
Sensitivity (95% CI)		0.56 (0.38 - 0.72)	0.84 (0.68 - 0.93)
Specificity (95% CI)		0.91 (0.87 - 0.93)	0.91 (0.88 - 0.94)
AUC (95% CI)		0.81 (0.72 - 0.89)	0.95 (0.92 - 0.97)

Abbreviations: CI, Confidence Interval, AUC, Area under Curve; CBCL, Child Behavior Checklist

¹ The criterion, CBCL, was assessed 12 months later

² The criterion, CBCL, was assessed 10 months later

Added value

Table 4 presents the findings regarding the added value of each questionnaire to the identification of the CHP at the age of 6, 14 and 24 months. An elevated score on the KIPPPI, ASQ:SE or the BITSEA is significantly related to an elevated CBCL-TPS. The adjusted odds ratios (ORs) at the age of 6 and 14 months varied from 2.8 (for the KIPPPI at 6 months) to 13.0 (for the BITSEA at 14 months). The 95% confidence intervals of all ORs at the age of 6 and 14 months overlapped for the various questionnaires, indicating that they did not differ significantly from each other regarding added value. At the age of 24 months, the BITSEA had highest sensitivity and added value.

Table 4. Results from separate logistic regression analyses on elevated CBCL-TPS scores, taking the identification by the CHP into account; Odds ratios (OR) and 95% confidence intervals (95% CI) for an elevated CBCL-TPS score, adjusted for problems identified by CHP

	6 months OR (95% CI)	14 months OR (95% CI)	24 months OR (95% CI)
KIPPPPI			
n	393	296	400
CHP detected problems: yes vs. no	2.3 (0.6 - 9.3)	3.3 (1.1 - 9.9)*	6.7 (2.9 - 15.4)**
Elevated score on questionnaire: yes vs. no	2.8 (1.2 - 6.6)*	2.9 (1.2 - 6.8)*	11.5 (5.5 - 24.3)**
ASQ:SE			
n	393	581	818
CHP detected problems: yes vs. no	1.8 (0.4 - 7.8)	2.3 (0.9 - 5.5)	4.0 (2.3 - 6.8)*
Elevated score on questionnaire: yes vs. no	4.7 (2.0 - 11.2)**	4.9 (2.7 - 8.9)**	9.3 (2.6 - 33.5)**
BITSEA			
n		285	418
CHP detected problems: yes vs. no		0.7 (0.1 - 4.1)	1.0 (0.3 - 2.8)
Elevated score on questionnaire: yes vs. no		13.0 (5.3 - 32.0)**	49.7 (19.3 - 128.0)**

* $p < 0.05$

** $p < 0.01$

Discussion

This study compared the psychometric properties of three short questionnaires (KIPPPPI ASQ:SE, and BITSEA,) and the degree to which they could improve the early detection of psychosocial problems among 6 to 24 months old children in PCH practice. Our findings show that at the age of 6 and 14 months none of the instruments studied was a good indicator of problems as measured by the CBCL. At the age of 24 months, the BITSEA discriminated appropriately between children with and without problems as measured by the CBCL-TPS. In addition, the BITSEA at this age offered most added value to the identification of psychosocial problems by CHPs based on clinical assessment alone. The differences between the BITSEA and the ASQ:SE were, however, not statistically significant.

None of the questionnaires could appropriately support the identification of psychosocial problems in children of 6 and 14 months of age. This finding contrasts with that of USA-based studies which reported higher sensitivity indices for both the BITSEA¹¹ and the ASQ:SE in this age group.^{14,19} The low sensitivity indices in our study may be due to the long time interval between filling in the tested questionnaires and the criterion (CBCL-TPS). Psychosocial problems assessed at age 6 and 14 months may have changed or even disappeared 10 months later. However, if this is the case, the utility of identification of problems at such a young age seems weak, as these problems apparently may disappear without professional help. This raises questions regarding the degree to which psychosocial problems are stable in the first two years. The development of the "Diagnostic Classification

0-3", in which the fifth axis refers to the child's emotional and social functioning, shows that psychosocial problems can be assessed in a reliable way in young children.²¹ We assume that the assessment of psychosocial problems in young children needs more intensive procedures than short parent-reported questionnaires. This explanation is supported by a Dutch study in which the longer questionnaire (ITSEA-NL) was used in the same age group. Its findings showed that parent-reported problem behavior was related to CHP's judgment whether a child has psychosocial problems at the age of 14 months.²²

At the age of 24 months, the BITSEA had highest sensitivity and added value, higher than the ASQ:SE and the KIPPPPI. The KIPPPPI was found to have low sensitivity indices and added value at all ages. This may be interpreted as that it does not support the identification of psychosocial problems in young children adequately.

Strengths and limitations

Strengths of our study are the large representative sample, the embedding in routine care and the use of a randomized method to compare several questionnaires. A limitation may be the use of the CBCL, a parent-reported questionnaire, as criterion for the validation of other parent-reported short questionnaires. This use of the same informant could have increased indices for validity. Clinical assessments like psychiatric interviews may provide additional information. They were not used as criteria in this study because of their complexity and costs, but also because they may measure a type of problems that only partially overlaps with the aim of community pediatric care.

Implications

Our findings imply that none of the questionnaires studied are sufficiently valid to support the identification of psychosocial problems by community pediatric services at the age of 6 and 14 months. Neither the KIPPPPI, the ASQ:SE nor the BITSEA have added value to the clinical assessment by PCH of psychosocial problems among infants younger than 15 months. At the age of 24 months, the BITSEA is a valid tool to support the early detection of psychosocial problems in routine community pediatric practice.

Our findings require confirmation by other studies as we are the first to examine the psychometric properties of short parent-based questionnaires in the setting of community pediatric services. Early identification of psychosocial problems facilitates effective intervention that prevents more serious psychosocial problems. However, findings imply that identifying parent-reported psychosocial problems at a very early age, before 24 months, may be less meaningful. More research is needed to find out the most optimal age to detect psychosocial problems in early childhood.

References

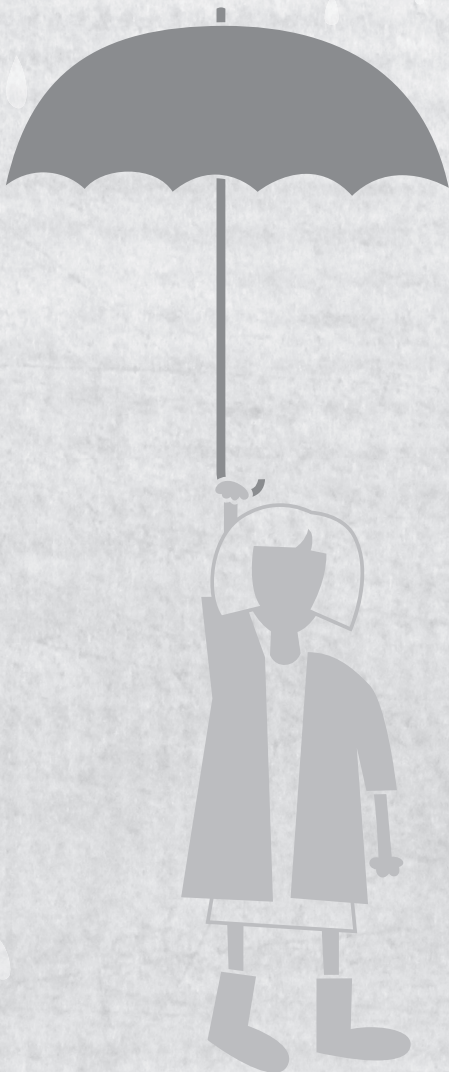
1. Brugman E, Reijneveld SA, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems by preventive child health care. *Arch Pediatr Adolesc Med.* 2001;155(4): 462-469.
2. Briggs-Gowan, MJ, Carter AS, Boson-Heenan J, Guyer AE, & Horwitz SM. Are infant-toddler social-emotional and behavioral problems transient? *J Am Acad Child Adolesc Psychiatry,* 2006; 45(7): 849-858.
3. Briggs-Gowan MJ & Carter AS. Social-emotional screening status in early childhood predicts elementary school outcomes. *Pediatrics,* 2008 (121): 957.
4. Durlak JA, Wells AM. Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *Am J Community Psychol.* 1998; 26 (5): 775-802.
5. Geeraert L, Noortgate van den W, Grietens H, Onghena P. The effects of early prevention programs for families with young children at risk for physical child abuse and neglect: A meta-analysis. *Child Maltreat.* 2004; (9): 277-291.
6. Reijneveld SA, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems among toddlers in Dutch preventive child health care. *Arch Pediatr Adolesc Med.* 2004; (158): 811-817.
7. Vogels AG, Crone MR, Hoekstra F, Reijneveld SA. Comparing three short questionnaires to detect psychosocial dysfunction among primary school children: A randomized method. *BMC Public Health.* 2009; (9): 489.
8. Achenbach T, Rescorla L. *Manual for the ASEBA Preschool Forms and Profiles.* Burlington: University of Vermont; 2000.
9. Goodman R. The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry.* 1997; (38): 581-586.
10. Goodman R, Ford T, Simmons H, Gatward R, Meltzer H. Using the strengths and difficulties questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *British Journal of Psychiatry.* 2000; (177) : 534-539.
11. Briggs-Gowan MJ, Carter AS, Irwin JR, Wachtel K, Cicchetti DV. The Brief Infant-Toddler Social and Emotional Assessment: screening for social-emotional problems and delays in competence. *J Pediatr Psychol.* 2004; (29):143-155.
12. Haapsamo H, Ebeling H, Soini H, Joskitt L, Larinen K, Penninkilampi-Kerola V, Carter A, Moilanen I: Screening infants with social and emotional problems: A pilot study of the Brief Infant Toddler Social and Emotional Assessment (BITSEA) in Northern Finland. *International Journal of Circumpolar Health,* 2009, 68(4): 386-393.

13. Karabekiroglu K, Rodopman-Arman A, Ay P, Ozkesen M, Akbas S, Tasdemir GN, Boke O, Peksen Y: The reliability and validity of the Turkish version of the brief infant-toddler social emotional assessment (BITSEA). *Infant Behavior & Development* 2009, 32(3):291-297.
14. Squires J, Bricker D, Heo K, Twombly E. Identification of social-emotional problems in young children using a parent-completed screening measure. *Early Childhood Research Quarterly*. 2001; (16): 405-419.
15. Kousemaker, NPJ. Onderkenning van psychosociale problematiek bij jonge kinderen. [Identification of psychosocial problems in young children.]. Assen: Van Gorcum; 1997.
16. Romijn A, Kousemaker P. De KIPPPPI-methode voor vroegtijdige onderkenning. Revisie en nadere verantwoording. [The KIPPPPI questionnaire for early detection. Revision and further justification.] Leiden: Universiteit Leiden, 2001.
17. Ferdinand RF, Visser JH, Hoogerheide KN, et al. Improving estimation of the prognosis of childhood psychopathology; combination of DSM-III-R/DISC diagnoses and CBCL scores. *J Child Psychol Psychiatry*. 2004; (45): 599-608.
18. Koot HM, Van Den Oord EJ, Verhulst FC, Boomsma DI. Behavioral and emotional problems in young preschoolers: Cross-cultural testing of the validity of the child behavior Checklist/2-3. *J Abnorm Child Psychol*. 1997; (25): 183-196.
19. Squires J, Bricker D, Twombly E. *Ages & Stages Questionnaires: Social-Emotional. A Parent-Completed Child-Monitoring System for Social-Emotional Behaviors*. Baltimore: Brookes Publishing; 2003.
20. Guillemin F. Cross-cultural adaptation and validation of health status measures. *Scand J Rheumatol*. 1995;24(2):61-63.
21. Zero To Three (2005). *Diagnostic classification of mental health and development disorders in infancy and early childhood, (rev.ed.)*. Washington, DC: Zero To Three Press.
22. Klein Velderman M, Crone MR, Wiefferink CH, Reijneveld SA. Identification and management of psychosocial problems among toddlers by preventive child health care professionals. *Eur J Public Health*. 2010;20(3):332-338.

Chapter 5

Comparing three short questionnaires to detect psychosocial problems in preschool children

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Submitted

Abstract

Background

Validated questionnaires help community pediatric services to identify psychosocial problems. Our aim was to assess which of three short questionnaires was most suitable for this identification among preschool-aged children.

Methods

We included 1,650 children (response 64%) aged 3-4 years undergoing routine health assessments in 18 services across the Netherlands. Child healthcare professionals interviewed and examined children and parents. Parents were randomized in whether they filled out the Strengths and Difficulties Questionnaire (SDQ) or the KIPPPI, a Dutch-origin questionnaire. In addition, all filled out the Ages and Stages questionnaires: Social-Emotional (ASQ:SE) and the Child Behavior Checklist (CBCL). We assessed the internal consistency and validity of each questionnaire, with CBCL and treatment status as criteria, and the degree to which each questionnaire could improve identification based solely on clinical assessment.

Results

The internal consistency of the total problems scale of each questionnaire was satisfactory, Cronbach's alphas varied between 0.75 and 0.98. Only the SDQ discriminated sufficiently between children with and without problems as measured by the CBCL (sensitivity = 0.76 at a cut-off point with specificity = 0.90), in contrast to the other two questionnaires (with sensitivity varying between 0.51-0.63). Similar results were found for the treatment status criterion, although sensitivity was lower for all questionnaires. The SDQ added most to the identification of psychosocial problems by CHPs, although the differences between the SDQ and the ASQ:SE were not statistically significant.

Conclusions

The SDQ is the best tool for the identification of psychosocial problems in preschool -aged children by community pediatric services.

Introduction

Many children suffer from psychosocial problems, such as social-emotional and behavioral problems.^{1,2} Children with psychosocial problems are likely to experience difficulties in various aspects of their daily functioning. Such problems may be severe and persist over time.³ Early detection and treatment can improve the prognosis for psychosocial problems in children.^{4,5}

Community pediatric services are important for the early identification of psychosocial problems in children because they offer routine healthcare services to the population as a whole. In the Netherlands, physicians and nurses (Child Healthcare Professionals, CHPs) working in the Preventive Child Healthcare system (PCH) routinely offer preventive healthcare to all children aged 0-19 on the basis of a statutory national scheme (Minister of Public Health, 2001). The PCH system is important for the early identification of psychosocial problems. It was shown, however, that CHPs failed to identify psychosocial problems in about half the children with parent-reported problems on the Child Behavior Checklist (CBCL) questionnaire, when they had to base their judgment solely on a clinical assessment.^{1,6}

Validated questionnaires may improve the identification of psychosocial problems by CHPs.⁷ An example of such a questionnaire is the CBCL, a highly reliable and valid instrument for assessing psychosocial problems in children.⁸⁻¹⁰ However, the CBCL questionnaire is too long to be used as a routine screening questionnaire in community pediatric services. Daily practice in these services requires short instruments.

Several short parent-reported questionnaires are available for use among preschool-aged children: the Strengths and Difficulties Questionnaire 3-4 (SDQ 3-4)^{11,12}, the Ages and Stages questionnaires: Social-Emotional (ASQ:SE)¹³ and the KIPPPI 1-4 (a Dutch questionnaire, the acronym standing for “short instrument for the psychological and pedagogical inventory”).¹⁴ No published studies are available that examine the psychometric properties of the SDQ 3-4. The psychometric properties of the SDQ Parent Form (PF) for older children (4-16 years) have been investigated many times, showing that these properties were good in different settings and in a number of countries^{12,15-20}, including the Netherlands.^{7,20-22} The psychometric properties of the ASQ:SE have been shown to be good in the USA²³, but the Dutch version has not yet been investigated. No published studies are available that investigate the psychometric properties of the KIPPPI 1-4.

The aim of this study was to compare the psychometric properties (internal consistency, scale structure and validity) and the added value of these questionnaires for the identification of psychosocial problems (compared to the regular clinical assessment by

the CHP) among 3-4 years old children by PCH. The questionnaires were validated using the following criteria: an elevated CBCL score and currently receiving treatment for psychosocial problems.

Methods

Population

The sample was obtained in a two-stage procedure. In the first step, all PCH services in the Netherlands were asked to participate in this study (at that time 55); 18 agreed to do so. The participating PCH services were located throughout the country. In the second step, each of the participating PCH services was required to provide a random sample of children aged 36 and 45 months who were invited for a routine well-child examination.

A total of 2575 parents were asked to participate in this study: 17.2% explicitly refused to participate, 15.7% did not return the questionnaire and 3.0% did not provide complete data on the questionnaires, resulting in a response of 1650 parents who provided data for their child (64.1%). Respondents were representative of the total sample in terms of gender and family composition, but non-response was higher for children of immigrant origin (compared with children from Dutch origin) and for children four years of age (compared with children three years of age). Differences between responders and non-responders with regard to child ethnicity, age, gender and family composition were small according to the Cohen effect size index w with w varying between 0.02-0.16.

Randomization

We used a somewhat adapted previously developed randomized procedure⁷, to compare the three questionnaires. Parents were randomized as to whether they filled out the SDQ or the KIPPI. In addition, all filled out the ASQ:SE and the CBCL. In that way, we obtained complete equivalence of data and prevented the set of questionnaires from becoming too long. This procedure led to two subsamples, the first one completed the CBCL, ASQ:SE and the SDQ, the second one completed the CBCL, ASQ:SE and the KIPPI.

Procedure and measurements

The data were collected during the routine well-child examinations, between August 2008 and June 2011. The questionnaires were mailed to parents along with the standard invitation for the preventive health assessment. They were filled in at home. The completed questionnaires were returned to the CHP in a sealed envelope and forwarded

to the research institute without being opened. The CHP then took a routine history and physically assessed each child. In order to measure clinical assessment and treatment status the CHP answered the following questions after each assessment: “Does the child have a psychosocial problem at this moment?” (yes or no) and “Does the child currently receive treatment for psychosocial problems?”. The last question was used as a measure of ‘treatment status’, one of the two criterion measures. The CHP also provided data about child age and gender, ethnic background, family composition, parental employment and educational level, number of siblings, and maternal and paternal age. Parental educational level was the highest level of education completed successfully by a parent. Family composition concerned the number of parents in the family (two parents or one parent). These background characteristics are presented in Table 1.

Currently receiving treatment for psychosocial problems and an elevated CBCL (1.5-5) Total Problems Score (TPS) were used as the criteria for the occurrence of psychosocial problems. The CBCL assesses parental reports about children’s behavioral and emotional problems in the preceding two months. Its reliability and validity have been found to be good, also in the Netherlands.⁸⁻¹⁰ The CBCL comprises 99 problem items that are used to compute Total, Internalizing and Externalizing problem scores. Children were allocated to a normal range or an elevated range using the 90th percentile cut-off point in this sample. The SDQ PF 3-4 was developed in Great Britain.^{11,12,21,22} It consists of 25 items relating to children’s strengths and difficulties. Each item has to be scored on a 3-point scale (0 = “not true”, 1 = “somewhat true” and 2 = “certainly true”). Items can be grouped in five subscales: emotional symptoms, conduct problems, hyperactivity-inattention, peer problems, and pro-social behavior. A SDQ Total Difficulties Score (TDS) can be calculated by adding up the scores for the first four sub-scales.

The ASQ:SE was developed in the USA as a complement to the Ages and Stages Questionnaires (ASQ), a general developmental screening tool for children.²⁴ The ASQ:SE addresses the social and emotional behavior of children ranging in age from 3 to 66 months. We used the 36 months (31 items) and 48 months (33 item) version.¹³ Each item has to be scored on a 3-point scale (0 = “never or rarely”, 5 = “sometimes” and 10 = “most of the time”). An additional 5 points are given for items where parents indicate that the behavior is of concern to them. Scores for each item are then combined into a total score. No official Dutch version of the ASQ:SE was available. Therefore, this questionnaire was translated following a procedure advised by Guillemin, using three native language translators and –independent- back-translators.²⁵ Translations were then compared on the basis of the back translations, leading to the selection of the best translation in Dutch.

The KIPPPPI 1-4 is a Dutch instrument for parents, designed specifically for Dutch PCH.

It contains 70 items, relating to children's social emotional development, well-being and behavior. Each item has to be scored on a 4-point scale (1 = "almost never", 2 = "sometimes" 3 = "often" and 4 = "almost always"). These items allow for the calculation of three subscales (competence, autonomy, well-being) and a total difficulties scale (TDS).

Analysis

The analyses included the assessment of the internal consistency, scale structure, the validity and the added value of the instruments for the identification of psychosocial problems. We first computed the internal consistency (Cronbach's alpha). Next, we examined the fit between the scale structure and the observed data with confirmatory factor analyses (CFA) using Mplus Structural Equation Modeling.²⁶ In the CFA, the models were considered as fitting when the Comparative Fit Index (CFI) was higher than 0.90. Because the CFI index is a strict criterion, we considered the model as an approximating fit when the Root Mean Square Error of Approximation (RMSEA) was less than 0.08.

The validity of the instruments was assessed with sensitivity and specificity indices, using CBCL TPS, and "current treatment for psychosocial problems" as the criteria. We used Cohen's kappas and Spearman correlation coefficients as measures of the overall agreement between the instrument and the criteria.

Next, the added value of the instruments was determined. We assessed the degree to which each instrument can improve the identification of children with problems based solely on clinical assessment by the CHP without knowledge of the instrument. Logistic regression analyses were performed for each instrument with the CBCL criterion measure as the dependent variable. The criterion "current treatment for psychosocial problems" was not used in the added value analyses, since psychosocial problems of children currently being treated were known to CHPs. In the first step the identification by a CHP was included in the analyses and in the second step the dichotomized score on the instrument was added as an independent variable. Finally, we repeated all logistic regression analyses excluding children currently receiving treatment for psychosocial problems, because the identification of children with problems is most relevant for those children who are not yet being treated for such problems.

No established cut-off points were available for the SDQ 3-4, KIPPI 1-4 and the ASQ:SE. We therefore chose an appropriate cut-off point, namely the score that was associated with a specificity of at least 0.90 in our sample, using the elevated CBCL TPS as criterion. These cut-off points led to 13.8% elevated scores on the SDQ, 13.6% elevated scores on the KIPPI, 15.3% elevated scores on the ASQ:SE 36 months, and 13.2% elevated scores on the ASQ:SE 48 months.

Results

Background characteristics of the sample

The mean age of the sample was 40 months (standard deviation: 5 months). Further demographic information is presented in Table 1. We found no differences in background characteristics between the two subsamples (KIPPPPI vs SDQ) as indicated by Chi-square tests, except for child age. The KIPPPPI sample comprised relatively more four-year-old children. Differences between the two subsamples with regard to child age were small according to the Cohen effect size index w ($w = 0.05$).

Table 1. Demographic characteristics of the participating children

	SDQ (n = 839) n (%)	KIPPPI (n = 832) n (%)	ASQ:SE (n = 1650)## n (%)
Background characteristics#			
Gender			
Boy	428 (51.0)	431 (51.9)	851 (51.6)
Girl	411 (49.0)	400 (48.1)	798 (48.4)
Child's age			
3 years	506 (61.2)	465 (56.2)	959 (58.7)
4 years	321 (38.8)	362 (43.8)	675 (41.3)
Ethnicity			
Dutch	692 (85.4)	705 (88.2)	1379 (86.8)
Migrant	118 (14.6)	94 (11.9)	210 (13.2)
Family composition			
Two parents	766 (96.0)	738 (94.7)	1484 (95.3)
One parent	32 (4.0)	41 (5.3)	73 (4.7)
Employment status			
Unemployed	10 (1.3)	15 (2.0)	25 (1.7)
One full-time job	165 (21.3)	153 (20.4)	315 (20.9)
One full-time + one part-time job	505 (65.2)	496 (66.1)	986 (65.5)
Both part-time	65 (8.4)	65 (8.7)	128 (8.5)
Both full-time	30 (3.9)	21 (2.8)	51 (3.4)
Parental educational level			
Lower education	100 (12.3)	88 (11.0)	186 (11.7)
Medium education	321 (39.6)	308 (38.6)	619 (39.0)
Higher education	389 (48.0)	401 (50.3)	783 (49.3)
Number of siblings			
No sibs	206 (24.6)	217 (26.1)	417 (25.3)
1 sib	441 (52.6)	415 (49.9)	850 (51.5)
2 and > sibs	192 (22.9)	200 (24.0)	383 (23.2)
Maternal age at birth			
19-30	176 (21.1)	177 (21.4)	350 (21.3)
31-35	336 (40.3)	309 (37.4)	641 (39.1)
36-40	257 (30.8)	281 (34.0)	527 (32.1)
>40	65 (7.8)	60 (7.3)	122 (7.4)
Paternal age at birth			
22-30	83 (10.1)	78 (9.6)	159 (9.9)
31-35	241 (29.5)	219 (26.9)	455 (28.2)
36-40	325 (39.7)	344 (42.3)	661 (41.0)
>40	169 (20.7)	172 (21.2)	336 (20.9)
Elevated CBCL score	84 (10.0)	80 (9.6)	163 (9.9)

Number of omissions : Gender (n = 1), Child's age (n = 16), Ethnicity (n = 61), Family composition (n = 93), Employment status (n = 145), Parental educational level (n = 62), Number of siblings (n = 0), Maternal age (n = 10), Paternal age (n = 40).

The total number of children does not add up to n = 1,671, because of omissions on the ASQ:SE questionnaire

Internal consistency and scale structure

The Cronbach's alphas of the total problem scales of the SDQ, KIPPPI and the ASQ:SE (36 and 45 months) were 0.78, 0.98, 0.77 and 0.75, respectively. The differences in Cronbach's

alphas could be explained by the differences in number of items: Cronbach's alphas corrected with the Spearman Brown Prophecy Formula resulted in 0.93, 0.98, 0.88 and 0.86, for the SDQ, KIPPPPI and the ASQ:SE (36 and 45 months). Cronbach's alphas for the SDQ subscales varied between 0.50 and 0.74 and for the KIPPPPI subscales between 0.36 and 0.99 (Table 2).

Table 2. Internal consistency of SDQ, KIPPPPI and ASQ:SE total problems scale and subscales

	Number of items	Cronbach's alpha
SDQ scales		
Total difficulties	20	0.78
Emotional symptoms	5	0.54
Conduct problems	5	0.64
Hyperactivity	5	0.74
Peer problems	5	0.50
Prosocial	5	0.65
KIPPPPI scales		
Total difficulties	70	0.98
Competence	28	0.86
Autonomy	10	0.36
Well-being	32	0.99
ASQ:SE		
Total 36 months	31	0.77
Total 45 months	33	0.75

Structural equation modeling showed a poor fit of the single-scale model of the SDQ, the KIPPPPI and the ASQ:SE according to the CFI criterion, but an approximating fit according to the RMSEA criterion (SDQ: CFI = 0.644, RMSEA = 0.079; KIPPPPI: CFI = 0.352, RMSEA = 0.073; ASQ:SE 36: CFI = 0.603, RMSEA = 0.065; ASQ:SE 45: CFI = 0.600, RMSEA = 0.057). For the SDQ and the KIPPPPI a more subtle model was evaluated, reflecting the subscales of the questionnaires. For both questionnaires a poor fit was found according to the CFI criterion (SDQ = 0.682; KIPPPPI = 0.456) and an approximate fit according to the RMSEA criterion (SDQ = 0.075; KIPPPPI = 0.069), when using independent subscales assuming no correlation between the subscales.

Validity

Table 3 presents data on the validity of the three questionnaires, using an elevated CBCL and treatment status as criteria. The SDQ, KIPPPPI and ASQ:SE scores correlated significantly with the CBCL scores. The highest correlation coefficient was found between the CBCL and the SDQ (Spearman's $r = 0.70$) and the lowest one between the CBCL and the ASQ:SE (45 months) (Spearman's $r = 0.54$).

Table 3 also presents the Cohen's kappas, sensitivity and specificity indices for both criteria

regarding the dichomotized total problems scores. Cohen's kappas varied between 0.35 (KIPPPi) and 0.59 (SDQ) for the CBCL, and varied between 0.10 (ASQ:SE 45) and 0.20 (SDQ) for treatment status.

Due to the way we established the cut-off points the specificity of all scales for the CBCL criterion is about 0.90 or slightly higher. Sensitivity indices varied from 0.51 (KIPPPi) to 0.76 (SDQ) for the CBCL criterion. Sensitivity using treatment status as criterion, varied from 0.40 (ASQ:SE 45 months) to 0.68 (SDQ) using the same cut-offs. Specificity using treatment status as criterion varied between 0.86 and 0.88.

Table 3. Test characteristics of the SDQ, KIPPPi and ASQ:SE using elevated CBCL score and treatment status as criteria

	SDQ	KIPPPi	ASQ:SE	
			36 months	45 months
Cut-off point	>10	>140	>52.5	>50.78
CBCL				
Spearman's r	0.70	0.57	0.63	0.54
Kappa	0.59	0.35	0.48	0.43
Sensitivity (95% CI)	0.76 (0.65-0.84)	0.51 (0.40-0.62)	0.65 (0.55-0.74)	0.63 (0.45-0.75)
Specificity (95% CI)	0.93 (0.91-0.95)	0.90 (0.77-0.83)	0.91 (0.89-0.93)	0.91 (0.88-0.93)
AUC (95% CI)	0.93 (0.90-0.96)	0.83 (0.78-0.87)	0.90 (0.88-0.93)	0.86 (0.81-0.92)
Treatment status				
Kappa	0.20	0.13	0.18	0.10
Sensitivity (95% CI)	0.68 (0.46-0.85)	0.48 (0.28-0.68)	0.67 (0.47-0.83)	0.40 (0.20-0.63)
Specificity (95% CI)	0.88 (0.86-0.90)	0.88 (0.86-0.90)	0.86 (0.84-0.88)	0.88 (0.85-0.90)
AUC (95% CI)	0.90 (0.85-0.95)	0.76 (0.69-0.85)	0.84 (0.76-0.92)	0.78 (0.70-0.86)

Abbreviations: CI, Confidence Interval; AUC, Area Under Curve; CBCL, Child Behavior Checklist

Added value

Table 4 presents the findings regarding the added value of each questionnaire to the identification of the CHP. These findings show that an elevated score on each of the three questionnaires increased the likelihood that a child has an elevated CBCL score compared with the clinical assessment by the CHP. The adjusted odds ratio (ORs) for all children were: SDQ 33.1 (18.1-60.8); KIPPPi 8.37 (4.99-14.1); ASQ:SE 36 months 15.5 (9.57-25.0); ASQ:SE 45 months 13.0 (6.85-24.5). An elevated SDQ TDS offers most added value for the prediction of an elevated CBCL compared to the other questionnaires. However, the 95% confidence intervals of the adjusted ORs of the SDQ and ASQ:SE overlapped with each other, indicating that there were no significant differences between these questionnaires. Repetition of these analyses for children not under treatment yielded similar results.

Table 4. Results from separate logistic regression analyses for each questionnaire on elevated CBCL TPS score, taking the identification by the CHP into account; Odds ratios (OR) and 95% confidence intervals (95% CI) for identification of problems in the child by CHP and elevated score on questionnaire

	SDQ	KIPPPI	ASQ:SE	
	OR (95% CI)	OR (95% CI)	36 months OR (95% CI)	45 months OR (95% CI)
All children				
n	812	802	930	664
CHP detected problems yes (vs. no)	4.70 (2.46-8.98)	2.50 (1.41-4.44)	2.99 (1.75-5.11)	3.99 (2.04-7.80)
Elevated score on questionnaire yes (v. no)#	33.1 (18.0-60.8)	8.37 (4.99-14.1)	15.5 (9.57-25.0)	13.0 (6.85-24.5)
Children not receiving treatment				
n	787	777	900	644
CHP detected problems yes (vs. no)	4.45 (2.16-9.19)	1.98 (1.03-3.80)	2.19 (1.20-4.0)	4.12 (2.01-8.44)
Elevated score on questionnaire yes (vs. no)#	35.1 (18.6-66.3)	9.76 (5.64-16.9)	13.9 (8.45-22.9)	12.6 (6.47-24.3)

Adding elevated scores to the model always led to a significant change in the log likelihood ratio.

Adjusted ORs, taking into account the identification of problems by the CHP.

Abbreviation: CHP, Child Healthcare Professional

Discussion

This study compared the psychometric properties (internal consistency, scale structure and validity) of three questionnaires (SDQ, KIPPPI and ASQ:SE) and whether they could enhance the early detection of psychosocial problems among 3-4 years old children in community pediatric practice. Our findings showed that the internal consistency of the total scale of each questionnaire was satisfactory. Regarding validity, only the SDQ discriminated sufficiently between 3-4 years old children with and without problems as measured by the CBCL, and not the other two questionnaires. Similar results were found for the treatment status criterion, although sensitivity was lower for all questionnaires using this criterion. The SDQ added more to the identification of psychosocial problems by CHPs than the KIPPPI and the ASQ:SE, although the differences between the SDQ and the ASQ:SE were not statistically significant.

Fit with previous literature

In general, our findings on the internal consistency and validity of the SDQ were in line with those of Vogels et al. on the SDQ 4-16 in older children (ages 7-12 years).⁷ The internal consistencies (Cronbach's alpha) of the total problem scales for both age versions was satisfying: 0.78 for the SDQ 3-4 and 0.80 for the SDQ 4-16. The sensitivities and the AUCs (which measure the accuracy of the SDQ for the detection of problems) in both SDQ

versions were in the same range. This implies that the validity of the SDQ was similar among preschool-age children and school-age children.

Our results showed poorer psychometric properties of the ASQ:SE compared to findings in the USA. In the USA Cronbach's alpha's varied between 0.89-0.91, while in our study they varied between 0.75-0.77 on the 36 and 48 months versions.²³ Our results also showed a lower sensitivity of the ASQ:SE compared to findings in the USA. In the USA sensitivity varied between 0.77-0.89 at a specificity between 0.88-0.92 on the 36 and 48 months versions.²³ However, our results showed similar (36 months version) and even better psychometric properties (48 months version) of the ASQ:SE compared to findings in Korea. In Korea sensitivity was 0.67 at a specificity of 0.96 on the 36 months version and 0.33 at a specificity of 0.93 on the 48 months version.²⁷ In our study the sensitivity varied between 0.63-0.65 at a specificity of 0.91 on the 36 and 48 months interval. What might explain the differences in psychometric properties between these countries? The ASQ:SE was developed in the USA, and in our study translated to Dutch. Cultural differences between the two countries and the translation of the ASQ:SE to Dutch might explain the differences in psychometric properties between the two countries. We previously showed, however, rather similar psychometric properties for Dutch version of the Pediatric Symptom Checklist (PSC), also developed in the USA, among children aged 9-11 years.²⁸ Additional research is needed on the explanation of these differences.

We found rather low internal consistencies for some subscales of the SDQ and the KIPPPPI. Cronbach's alphas varied between 0.48-0.73 for the SDQ 3-4 and between 0.36 and 0.99 for the KIPPPPI. For the SDQ the low internal consistencies may be partly due to the small number of items comprising a scale (5 items). Furthermore, the analyses investigating the scale structures of the questionnaires showed mediocre and negative Structural Equation Modeling results. This implies that the items provide information that is not expressed in the subscale scores. More research is needed to investigate the subscale structure of the SDQ. Only for the SDQ we found previous studies that assessed the added value, being (65.4, CI 24.8-172.4) for the SDQ 4-19 compared to 33.1 (CI 18.0-60.8) for the SDQ 3-4.⁷ The 95% confidence intervals overlap, so the difference relating to added value was not statistically significant. This implies that the added value of the SDQ to the identification of psychosocial problems by CHPs was similar among pre-school children and school-age children.

Strengths and limitations

Our study has a number of strengths such as its big sample size, good response rate, community-based nature, and embedding in routine practice. Moreover, we used the CBCL

as the validation criterion. The CBCL is a well-validated questionnaire for behavioral and emotional problems. However, a limitation may be that the questionnaires to be assessed and the CBCL were completed by the parent, which could increase agreement. Clinical assessments like psychiatric interviews may provide additional information. Because of their complexity and high costs, they were not used as criteria in this study. However, we were able to use treatment status as a criterion. We found somewhat lower validity indices when using treatment status as a criterion, although they were all in the same direction as the validity indices for an elevated CBCL score.

Implications

Which of three short questionnaires (SDQ, KIPPPI, ASQ:SE,) was most suitable for the identification of psychosocial problem among preschool-aged children? Regarding validity, only the SDQ discriminated sufficiently between 3-4 years old children with and without problems. Regarding use in community pediatric practice, the data were collected during routine practice, which supports the potential generalization of our results to this routine practice. Our findings showed that the SDQ adds more information to the identification in community pediatric practice than the KIPPPI and ASQ:SE. In sum, the SDQ can best be applied in community pediatric practice for the identification of psychosocial problems among preschool children.

We found poorer psychometric properties of the Dutch ASQ:SE than of the ASQ:SE in the USA. This may be caused by cultural differences or by differences in the interpretation of the items due to the translation of the ASQ:SE to Dutch. We recommend to replicate the validation of the ASQ:SE in other countries (preferably English speaking), for example Great Britain to investigate the cause of these differences.

Our findings imply that the use of short questionnaires, in particular the SDQ can improve the identification of psychosocial problems in community pediatric practice. Training in the use of the SDQ is needed to support the implementation of this questionnaire. As a next step after this identification, use of longer questionnaires and consultation of mental health specialists may help to target care to those most in need.

Conclusion

Our comparison of the SDQ, KIPPPI and ASQ:SE showed that only the SDQ 3-4 had satisfactory psychometric properties and added value for community pediatric services. The SDQ can be considered as a useful aid for the early detection of psychosocial problems. Furthermore, the SDQ can provide effective support for community pediatric services in the identification of psychosocial problems among preschool-aged children. This instrument can therefore be validly applied in community pediatric practice.

References

1. Brugman E, Reijneveld SA, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems by preventive child health care. *Arch Pediatr Adolesc Med.* 2001;155(4):462-469.
2. Leaf PJ, Alegria M, Cohen P, et al. Mental health service use in the community and schools: Results from the four-community MECA study. methods for the epidemiology of child and adolescent mental disorders study. *J Am Acad Child Adolesc Psychiatry.* 1996;35(7):889-897.
3. Feil E, Severson H, Walker H. Screening for emotional and behavioral delays: The early screening project. *Journal of Early Intervention.* 1998;21(3):252-265.
4. Durlak JA, Wells AM. Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *Am J Community Psychol.* 1998;26(5):775-802.
5. Geeraert L, Noortgate van den W, Grietens H, Onghena P. The effects of early prevention programs for families with young children at risk for physical child abuse and neglect: A meta-analysis. *Child Maltreat.* 2004;9(3):277-291.
6. Reijneveld SA, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems among toddlers in Dutch preventive child health care. *Arch Pediatr Adolesc Med.* 2004;158(8):811-817.
7. Vogels AG, Crone MR, Hoekstra F, Reijneveld SA. Comparing three short questionnaires to detect psychosocial dysfunction among primary school children: A randomized method. *BMC Public Health.* 2009;9(1):489.
8. Achenbach T, Rescorla L. *Manual for the ASEBA Preschool Forms and Profiles.* Burlington: University of Vermont; 2000.
9. Ferdinand RF, Visser JH, Hoogerheide KN, et al. Improving estimation of the prognosis of childhood psychopathology; combination of DSM-III-R/DISC diagnoses and CBCL scores. *J Child Psychol Psychiatry.* 2004;45(3):599-608.
10. Koot HM, Van Den Oord EJ, Verhulst FC, Boomsma DI. Behavioral and emotional problems in young preschoolers: Cross-cultural testing of the validity of the child behavior Checklist/2-3. *J Abnorm Child Psychol.* 1997;25(3):183-196.
11. Goodman R. The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry.* 1997;38:581-586.
12. Goodman R, Ford T, Simmons H, Gatward R, Meltzer H. Using the strengths and difficulties questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *British Journal of Psychiatry.* 2000;177:534-539.

13. Squires J, Bricker D, Twombly E. *Ages & Stages Questionnaires: Social-Emotional. A Parent-Completed Child-Monitoring System for Social-Emotional Behaviors*. Baltimore: Brookes Publishing; 2003.
14. Romijn A, Kousemaker P. *De KIPPPPI-Methode Voor Vroegtijdige Onderkenning. Revisie En Nadere Verantwoording*. Leiden: Universiteit Leiden; 2001.
15. Hawes DJ, Dadds MR. Australian data and psychometric properties of the strengths and difficulties questionnaire. *Aust N Z J Psychiatry*. 2004;38(8):644-651.
16. Koskelainen M, Sourander A, Kaljonen A. The strengths and difficulties questionnaire among finnish school-aged children and adolescents. *Eur Child Adolesc Psychiatry*. 2000;9(4):277-284.
17. Malmberg M, Rydell AM, Smedje H. Validity of the swedish version of the strengths and difficulties questionnaire (SDQ-swe). *Nord J Psychiatry*. 2003;57(5):357-363.
18. Mullick MS, Goodman R. Questionnaire screening for mental health problems in bangladeshi children: A preliminary study. *Soc Psychiatry Psychiatr Epidemiol*. 2001;36(2):94-99.
19. Woerner W, Becker A, Rothenberger A. Normative data and scale properties of the german parent SDQ. *Eur Child Adolesc Psychiatry*. 2004;13 Suppl 2:II3-10.
20. Crone MR, Vogels AG, Hoekstra F, Treffers PD, Reijneveld SA. A comparison of four scoring methods based on the parent-rated strengths and difficulties questionnaire as used in the Dutch preventive child health care system. *BMC Public Health*. 2008;8:106.
21. Muris P, Meesters C, van den Berg F. The strengths and difficulties questionnaire (SDQ)--further evidence for its reliability and validity in a community sample of dutch children and adolescents. *Eur Child Adolesc Psychiatry*. 2003;12(1):1-8.
22. van Widenfelt BM, Goedhart AW, Treffers PD, Goodman R. Dutch version of the strengths and difficulties questionnaire (SDQ). *Eur Child Adolesc Psychiatry*. 2003;12(6):281-289.
23. Squires J, Bricker D, Heo K, Twombly E. Identification of social-emotional problems in young children using a parent-completed screening measure. *Early Childhood Research Quarterly*. 2001;16:405-419.
24. Bricker D, Squires J. *Ages & Stages Questionnaires: A Parent-Completed, Child-Monitoring System*. Vol 2. Baltimore: Brooks; 1999.
25. Guillemin F. Cross-cultural adaptation and validation of health status measures. *Scand J Rheumatol*. 1995;24(2):61-63.
26. Byrne BM. *Structural Equation Modeling with Mplus: Basic Concepts Applications and Programming*. New York: Routledge; 2011.

27. Heo KH, Squires J. Cultural adaptation of a parent completed social emotional screening instrument for young children: Ages and stages questionnaire-social emotional. *Early Hum Dev.* 2012;88(3):151-158.
28. Reijneveld SA, Vogels AG, Hoekstra F, Crone MR. Use of the pediatric symptom checklist for the detection of psychosocial problems in preventive child healthcare. *BMC Public Health.* 2006;6:197.

Chapter 6

Characteristics of the strengths and difficulties questionnaire in preschool children

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Abstract

Objective

Validated questionnaires help the Preventive Child Healthcare (PCH) system to identify psychosocial problems. This study assesses the psychometric properties and added value of the Strengths and Difficulties Questionnaire (SDQ) for the identification of psychosocial problems among preschool children aged (3-4 years) by PCH.

Methods

We included 839 children (response 66%) 3 to 4 years of age undergoing routine health assessments in 18 PCH services across the Netherlands. Child healthcare professionals interviewed and examined children and parents. Before the interview, parents completed the SDQ and the Child Behavior Checklist (CBCL). We assessed the internal consistency, the scale structure and validity (correlation coefficients, sensitivity and specificity), with CBCL and treatment status as criteria, and the degree to which the SDQ could improve identification solely on the basis of clinical assessment.

Results

The internal consistency of the SDQ total difficulties score was good (Cronbach's α , 0.78), but it was worse for some subscales of the SDQ (range, 0.50-0.74). The area under the Receiver operating characteristic curve using the CBCL as a criterion was 0.94 (95% confidence interval 0.91-0.97), and sensitivity and specificity were 0.79 and 0.93 respectively. The SDQ added information to the clinical assessment; the odds ratio was 36.48 for added information by using the CBCL as a criterion.

Conclusions

The SDQ is a valid tool for the identification of psychosocial problems in preschool-aged children by PCH. However, the low reliability of some SDQ subscales does not justify use of these subscales for decisions about further treatment.

Introduction

A large proportion of children suffer from psychosocial problems, such as social-emotional and behavioral problems.^{1,2} Children with psychosocial problems are likely to experience difficulties in their daily functioning. Such problems may be severe and persist over time.³ Early detection and treatment can improve the prognosis for psychosocial problems in children.^{4,5}

In the Netherlands, preventive child healthcare (PCH) offers an ideal opportunity for the early detection of psychosocial problems among preschool-aged children, comparable to community pediatric services in the United States. In PCH, child health professionals (CHPs), ie, doctors and nurses, offer routine well-child examinations, including the early detection of psychosocial problems, to the entire Dutch population. Care is free of charge, and access is independent of insurance status but the services do not provide treatment, in contrast to the US system.

Although the PCH system is important for the early identification of psychosocial problems, CHPs failed to identify psychosocial problems in 70% of the preschool-aged children (14 months to 4 years) with parent-reported problems on the Child Behavior Checklist (CBCL) questionnaire or Infant Toddler Social and Emotional Assessment (ITSEA). Furthermore, 5% to 7% of the children with no clinical problems on the CBCL or ITSEA were identified as having psychosocial problems by the CHPs.^{6,7}

Validated questionnaires may improve the identification of psychosocial problems by CHPs.⁸ An example of such a questionnaire is the CBCL, a highly reliable and valid instrument for assessing psychosocial problems in children.⁹⁻¹¹ However, the CBCL questionnaire is too long to be used as a routine screening questionnaire in PCH. Instruments used in PCH must be short. For preschool-aged children (3-4 years old), no brief validated questionnaire is available to support the early identification of psychosocial problems in PCH.

The Strengths and Difficulties Questionnaire (SDQ) is a brief behavioral screening questionnaire.¹² This questionnaire was developed by Robert Goodman in the United Kingdom but is now available in many languages. The SDQ can be completed by parents, teachers, and the children themselves. There are 2 age versions of the SDQ parent form: SDQ 3-4 and 4-16. The psychometric properties of the SDQ Parent Form 4-16 have been shown to be good in different settings and in a number of countries,¹³⁻¹⁸ including the Netherlands.^{8,19-21} It has also been shown to fit PCH requirements.^{8,19} No studies are available that examine the psychometric properties of the SDQ Parent Form 3-4. Given the good validity of the SDQ 4-16 in many countries, the SDQ 3-4 is a promising option for use

in PCH for preschool-aged children. The aim of this study was to assess the psychometric properties (internal consistency, scale structure and validity) and the added value of the SDQ Parent Form 3-4 for the identification of psychosocial problems among preschool-aged children. The SDQ 3-4 was validated by using the following criteria: an elevated CBCL score and currently receiving treatment of psychosocial problems.

Methods

Population

The sample was obtained in a 2-stage procedure. In the first step, all PCH services in the Netherlands were asked to participate in this study (at that time 55); 18 agreed to do so. These were spread all over the country. In the second step, each of the participating PCH services provided a random sample of children aged 36 and 45 months who were invited for their routine well-child examinations. A total of 1280 parents were asked to participate in this study: 16.1% explicitly refused to participate, 15.9% did not return the questionnaire, and 2.4% did not provide complete data on the questionnaires, resulting in a response of 839 children (65.5%). Respondents were representative of the total sample in terms of family composition, but nonresponse was higher for children of immigrant origin (27.1% compared with 18.3% for children from Dutch origin), for older children aged 42 to 52 months (39.5% compared with 22.0% for children aged 31-41 months) and for girls (34.1% compared with 28.9% for boys). The differences between the responders and nonresponders with regard to child ethnicity, age, and gender were small according to the Cohen effect size index w (range of w : 0.04-0.18). The sample was representative for the entire Dutch population, except that children of immigrant origin were underrepresented because of the sampling procedure.

Measurements

The data were collected during the routine well-child examinations. The CBCL 1.5-5 and the SDQ 3-4 were mailed to parents along with the standard invitation for the well-child examination and were filled in at home. The completed questionnaires were returned to the CHP in a sealed envelope and forwarded to the research institute without being opened.

The CHP then took a routine history and physically assessed each child before answering the following questions. Does the child have a psychosocial problem at this moment (yes or no)? Does the child currently receive treatment for psychosocial problems?

The CHP also provided data about child age and gender, ethnic background, family

composition, parental employment and educational level, number of siblings, and maternal and paternal age. The parental educational level was the highest level of education completed by either one of the parents. Family composition focused on the number of parents in the family (2 parents or 1 parent). The CHPs recorded these background characteristics during the assessment. They are presented in Table 1.

Currently receiving treatment of psychosocial problems and an elevated CBCL (1.5-5) Total Problems Score (TPS) were used as the criteria for psychosocial problems. The CBCL assesses parental reports about children's behavioral and emotional problems in the preceding 2 months. Its reliability and validity have been found to be sound, including in the Netherlands.⁹⁻¹¹ The CBCL comprises 99 problem items that are used to compute total, internalizing and externalizing problem scores. Children were allocated to a normal range or an elevated range by using the 90th percentile cutoff point.

We used the parent version of the SDQ 3-4.^{12,20,21} This instrument is quite comparable to the better known SDQ 4-16. Both questionnaires consist of 25 items relating to children's strengths and difficulties and 8 items relating to the severity and the impact of problems. Six items of the SDQ 3-4 are phrased slightly differently than the corresponding SDQ 4-16 items. Two SDQ 4-16 items, referring to lying, cheating, and stealing, however, were removed and replaced by more age-adequate conduct problems (Appendix, items 18 and 22). Each item has to be scored on a 3-point scale (0 = not true, 1 = somewhat true, and 2 = certainly true). The SDQ consists of 5 subscales: emotional symptoms, conduct problems, hyperactivity-inattention, peer problems, and prosocial behaviour. A SDQ Total Difficulties Score (TDS) is calculated by adding up the scores for the first 4 subscales mentioned above. The questions on the impact of problems refer to the duration, distress, social impairment, and burden for others. An impairment score was calculated by aggregating the scores for distress and social impairment. A 3-point scale is used for each item: 0 = not at all/ only a little, 1 = quite a lot, and 2 = a great deal.

Analysis

The analyses assessed the psychometric properties of the SDQ and its added value for the identification of psychosocial problems. Regarding psychometric properties, we first computed the internal consistency (Cronbach's α). Next, we examined the fit between the scale structure and the observed data with confirmatory factor analysis (CFA) using AMOS Structural Equation Modeling (SEM). In the CFA, the models were considered to be a good fit when the Parsimony Comparative Fit Index (PCFI) was > 0.90 . Because the PCFI index is a strict criterion, we considered the model to be an approximate fit when the Root Mean Square Error of Approximation (RMSEA) was < 0.08 . Items with regression weights

< 0.30 were considered not to be a fit.²² The validity of the SDQ TDS and impairment score was assessed with sensitivity and specificity indices, using CBCL TPS, internalising and externalising problems scores, and “currently receiving treatment for psychosocial problems” as the criteria. Cohen’s κ and Spearman correlation coefficients were calculated to assess the overall agreement between the SDQ and the criteria.

We determined the added value of the SDQ TDS and impairment score by assessing the degree to which the SDQ can improve the identification of children with problems based solely on clinical assessment by the CHP without knowledge of the SDQ. A logistic regression analysis was performed with the CBCL criterion measures as the dependent variable. The criterion “currently receiving treatment for psychosocial problems” was not used in these analyses, because treatment status may be expected to be known to CHPs. In the first step the identification by a CHP was included in the analyses and in the second step, the SDQ TDS or the SDQ impairment score was added as an independent variable. Next, we repeated these logistic regression analyses by adding the SDQ TDS in the second step and the SDQ impairment score in the third step. The identification of children with problems is most relevant for those children who are not being treated for such problems. We therefore repeated these analyses excluding children currently receiving treatment for psychosocial problems.

Results

Demographics

The mean age of the sample was 40 months (SD: 5 months). Further demographic information is presented in Table 1.

Table 1. Demographic characteristics of the participating children and differences between children with and without problems identified by the SDQ (n = 839)

Characteristic	Total	Elevated SDQ Total Difficulties Score	Elevated SDQ Impairment Score
	n (%)	n (%)	n (%)
Gender			
Boy	428 (51.0)	66 (15.4)	24 (5.6)
Girl	411 (49.0)	50 (12.2)	25 (6.1)
Child's age			
3 Y (range 31-41 mo; mean, 36.4; Sd=1.1)	506 (61.2)	77 (15.2)	27 (5.3)
4 Y (range 42-52 mo; mean, 46.5; Sd=1.6)	321 (38.8)	37 (11.5)	21 (6.5)
Ethnicity			
Dutch	692 (85.4)	86 (12.4)	39 (5.6)
Former colony	22 (2.7)	4 (18.2)	0 (0.0)
Labour migrant	32 (4.0)	8 (25.0)	1 (3.10)
Other nonindustrialized country	49 (6.0)	12 (24.5)	4 (8.20)
Other industrialized	18 (1.9)	2 (13.3)	2 (13.3)
Family composition			
Two parents	766 (96.0)	103 (13.4)	42 (5.5)
One parent	32 (4.0)	6 (18.2)	3 (9.1)
Employment status			
Unemployed	10 (1.3)	4 (40.0)	0 (0.0)
One full-time job	165 (21.3)	36 (21.8)	14 (8.5)
One full-time + 1 part-time job	505 (65.2)	53 (10.5)	22 (4.4)
Both part-time	65 (8.4)	7 (10.8)	3 (4.6)
Both full-time	30 (3.9)	4 (13.3)	3 (10.0)
Parental educational level			
Lower education	100 (12.3)	28 (28.0)	8 (8.0)
Medium education	321 (39.6)	48 (15.0)	19 (5.9)
Higher education	389 (48.0)	36 (9.3)	20 (5.1)
Number of siblings			
No sibs	206 (24.6)	34 (16.5)	10 (4.9)
One sib	441 (52.6)	63 (14.3)	33 (7.5)
Two or more siblings	192 (22.9)	19 (9.9)	6 (3.1)
Maternal age (y)			
21-30	176 (21.1)	42 (23.9)	16 (9.1)
31-35	336 (40.3)	44 (13.1)	19 (5.7)
36-40	257 (30.8)	18 (7.0)	10 (3.9)
>40	65 (7.8)	9 (13.8)	3 (4.6)
Paternal age (y)			
25-30	83 (10.1)	23 (27.7)	11 (13.3)
31-35	241 (29.5)	35 (14.5)	10 (4.1)
36-40	325 (39.7)	32 (9.8)	17 (5.2)
>40	169 (20.7)	21 (12.4)	9 (5.3)
Total	839 (100)	116 (13.8)	49 (5.8)

Missing: Gender (n = 0), Child's age (n = 12), Ethnicity (n = 29), Family composition (n = 41), Employment status (n = 64), Parental educational level (n = 29), Number of siblings (n = 0), Maternal age (n = 5), Paternal age (n = 21)

Scale structure

The internal consistency of the SDQ TDS was 0.78. For the 5 subscales of the SDQ, Cronbach’s α varied between 0.50 and 0.74 (Table 2).

Table 2. Internal consistency of scores on SDQ Total Difficulties and subscales

SDQ scales	Cronbach’s α
Total difficulties	0.78
Emotional symptoms	0.54
Conduct problems	0.64
Hyperactivity	0.74
Peer problems	0.50
Prosocial	0.65

SEM for the single-scale model produced a PCFI of 0.523 and a RMSEA of 0.079 (Confidence interval [CI] 0.075-0.084), suggesting an approximate fit for the single-scale model. Seven items had regression weights $\beta < 0.30$ (3, 6, 11, 13, 19, 23, and 24; see Appendix).

For a model with the SDQ subscales, PCFI was 0.550 and RMSEA was 0.075 (CI 0.071-0.080), also suggesting an approximate fit for this model. Two items had regression weights < 0.30 (3 and 19).

Validity

The SDQ TDS and the CBCL subscales scores correlated significantly with the CBCL scores (Table 3). The highest correlation coefficient was found between the CBCL TPS and the SDQ TDS (Spearman’s $r = 0.70$) and the lowest was between the SDQ peer problems score and the CBCL externalizing problems score (Spearman $r = 0.22$).

Table 3. Spearman correlations between SDQ scales and CBCL Total, Internalising, and Externalising problems

SDQ scales	CBCL		
	Total Problems	Internalizing problems	Externalizing problems
Total difficulties	0.70**	0.58**	0.66**
Emotional symptoms	0.40**	0.45**	0.25**
Conduct problems	0.59**	0.42**	0.64**
Hyperactivity	0.51**	0.34**	0.64**
Peer problems	0.32**	0.35**	0.22**
Prosocial	-0.37**	-0.28**	-0.38**
Impairment	0.51**	0.48**	0.40**

** $P < .01$

The literature does not state a cutoff point for the SDQ 3-4. We therefore chose an appropriate cutoff point, namely the score that was associated with a specificity of at least

0.90 in our sample, using the elevated CBCL TPS as the criterion. We assessed whether different SDQ TDS cutoffs were needed for boys and girls; this was not the case. The chosen cutoff point was ≥ 11 for the TDS, resulting in 13.8% elevated scores. The cutoff point for the SDQ impairment scale was ≥ 1 , resulting in 5.8% elevated scores.

Tables 4 and 5 presents the Cohen's κ , sensitivity, and specificity for all criteria. The Cohen's κ for the SDQ TDS varied between 0.47 and 0.59 for the CBCL criteria, and was 0.20 for treatment status. Sensitivity and specificity for the SDQ TDS varied from 0.64 to 0.79 and 0.92 to 0.93, respectively for the CBCL criteria, and were 0.68 and 0.88, respectively, for treatment status.

Sensitivity for the SDQ impairment score varied from 0.38 to 0.39, and specificity was 0.98 for all CBCL criteria. Sensitivity and specificity for treatment status were 0.60 and 0.96, respectively.

Repetition of these validity analyses without the items with an inadequate fit for the single scale model in the SEM analyses yielded similar results (data not shown).

Table 4. Test characteristics of the SDQ Total Difficulties score using elevated CBCL scores and treatment status as criteria

Test characteristic	CBCL			Treatment status
	Total Problems	Internalizing problems	Externalizing Problems	
Kappa	0.59	0.47	0.52	0.20
Sensitivity	0.79	0.64	0.70	0.68
Specificity	0.93	0.92	0.92	0.88
AUC	0.94 (0.91-0.97)	0.89 (0.85-0.92)	0.92 (0.89-0.95)	0.90 (0.85-0.95)

AUC, area under the curve

Table 5. Test characteristics of the SDQ impairment score using elevated CBCL scores and treatment status as criteria

Test characteristic	CBCL			Treatment status
	Total Problems	Internalizing problems	Externalizing Problems	
Kappa	0.44	0.44	0.42	0.38
Sensitivity	0.39	0.39	0.38	0.60
Specificity	0.98	0.98	0.98	0.96
AUC	0.72 (0.62-0.81)	0.74 (0.64-0.83)	0.69 (0.59-0.79)	0.77 (0.64-0.89)

AUC, area under the curve

Added value

These results show that both an elevated SDQ TDS and an elevated SDQ impairment score are accompanied by an increase in the likelihood of identifying children with an

elevated CBCL score (TPS, internalizing, or externalizing) compared with a clinical assessment alone by the CHP (Table 6) The adjusted odds ratios (ORs) for elevated SDQ TDS scores were significant and ranged from 14.3 to 36.5. Adjusted ORs for elevated SDQ impairment scores were significant and ranged from 14.8 to 16.4. The analyses in which the SDQ impairment score was added to the SDQ TDS showed that the adjusted ORs for elevated SDQ impairment scores were statistically significant and ranged from 5.10 to 6.88. However, the ORs for the SDQ TDS were substantially lower compared with the first added value analyses where the SDQ impairment score was not added. The latter finding indicates that the contribution of the SDQ impairment score overlaps with the contribution of the SDQ TDS.

Repetition of these analyses for children not under treatment for psychosocial problems yielded similar results (data not shown).

Table 5. Results from separate logistic regression analyses on elevated CBCL scores, taking the identification by the CHP into account

	CBCL												
	Total problems				Internalizing problems				Externalizing problems				
	OR (95% CI)	Sens.*	Spec.**	OR (95% CI)	Sens.*	Spec.**	OR (95% CI)	Sens.*	Spec.**	OR (95% CI)	Sens.*	Spec.**	
SDQ TDS													
CHP detected problems yes (versus no)	5.02 (2.59-9.76)	0.51	0.90	4.12 (2.30-7.39)	0.46	0.90	3.56 (1.92-6.62)	0.46	0.89				
Elevated SDQ TDS score yes (versus no) ^a	36.5 (19.3-69.1)	0.79	0.93	14.3 (8.25-24.7)	0.64	0.92	20.2 (11.3-36.2)	0.70	0.92				
SDQ Impairment score													
CHP detected problems yes (versus no)	6.00 (3.37-10.7)	0.51	0.90	4.76 (2.69-8.41)	0.46	0.90	4.40 (2.45-7.89)	0.46	0.89				
Elevated SDQ impairment score yes (versus no) ^a	15.8 (7.71-32.2)	0.39	0.98	16.4 (8.09-33.1)	0.38	0.98	14.8 (7.35-29.7)	0.38	0.97				
SDQ TDS plus Impairment score													
CHP detected problems yes (versus no)	4.02 (2.00-8.08)	0.51	0.90	3.22 (1.72-6.03)	0.46	0.90	2.77 (1.43-5.36)	0.46	0.89				
Elevated SDQ TDS score yes (versus no) ^a	27.0 (13.9-52.3)	0.79	0.93	9.65 (5.36-17.4)	0.64	0.92	14.4 (7.77-26.6)	0.70	0.92				
Elevated SDQ impairment score yes (versus no) ^b	5.40 (2.11-12.3)	0.83	0.91	6.88 (3.10-15.3)	0.71	0.91	5.43 (2.41-12.3)	0.74	0.90				

ORs and 95% CIs were used for identification of problems in the child by PCH and elevated SDQ score

n = 812. Adding elevated SDQ scores to the model always led to a significant change in the log likelihood ratio

^a Adjusted ORs, taking into account the detection of problems by the CHP

^b Adjusted ORs, taking into account the detection of problems by the CHP and elevated SDQ TDS score

* sensitivity

** specificity

Discussion

This study examined the psychometric properties of the SDQ 3-4 and the degree to which it enhances the early detection of psychosocial problems among preschool-aged children in PCH practice. Our findings show that the SDQ TDS discriminates between preschool-aged children with and without problems as measured by the CBCL and treatment status. The SDQ TDS is somewhat more sensitive to externalizing than to internalizing problems. The SDQ impairment score does not sufficiently discriminate between children with and without problems; sensitivity is low using CBCL TPS as the criterion. The SDQ TDS and impairment score both have added value for the identification of psychosocial problems among preschool-aged children by PCH.

However, for the criterion 'treatment status' the validity (ie sensitivity) was slightly lower than for the criterion "CBCL". Similar results were found in previous research.^{19,23,24} An explanation may be that some children with psychosocial problems never contact mental health services, while other children without psychosocial problems actually receive treatment from mental health services (for instance due to child rearing challenges).

Fit with previous literature and other questionnaires used in PCH

This study was the first study to investigate the psychometric properties and added value of the SDQ 3-4 for assessing psychosocial problems in preschool-aged children. Some studies have investigated the psychometric properties of other short questionnaires (such as Brief Infant Toddler Social Emotional Assessment and Ages and Stages Questionnaires:Social-Emotional) to detect psychosocial problems in preschool-aged children^{25,26} but these studies did not assess the added value of these instruments for community pediatric services.

In general, our findings are in line with the findings of Vogels et al,⁸ who investigated the psychometric properties of the SDQ 4-16 in older children (ages 7-12 years) in the Netherlands. The internal consistency of the total problem scales for both age versions was very satisfying: 0.78 for the SDQ 3-4 and 0.80 for the SDQ 4-16. The internal consistency of some subscales was relatively low in both age versions. Cronbach's α varied between 0.50 and 0.74 for the SDQ 3-4 and between 0.55 and 0.78 for the SDQ 4-16. The internal consistency of the SDQ subscales does not justify using these subscales for decisions about whether individual children require further attention. Other studies also yielded mixed support for the SDQs 5- factor structures when using CFAs.^{27,28} On the basis of empirical and theoretical support Goodman²⁷ proposed alternative subscales (ie internalising and externalising subscales instead of the original 5 subscales). We calculated internal

consistencies for the subscales internalizing and externalizing, yielding Cronbach α of 0.62 and 0.72, respectively. These values show that the internal consistency improves somewhat when using 2 broader subscales instead of the 5 original subscales. Following George and Mallery's²⁹ rules of thumb the internal consistency of the internalizing subscale is at the edge of acceptable, so using this scale carefully seems to be justified.

The sensitivities and the Areas under the curve (which measure the accuracy of the SDQ for the detection of problems) in both SDQ versions are in the same range.⁸

With respect to the added value, we found that the SDQ TDS contributes in determining whether preschool-aged children have problems, after taking into account identification by PCH. The added value of the SDQ TDS is lower for the SDQ 3-4 (OR, 36.48; CI 19.26-69.12) than for the SDQ 4-16 (OR, 65.4; CI, 24.8-172.4), but the CIs overlap, so the difference relating to added value was not statistically significant.⁸

Limitations

Methodological factors are unlikely to have affected our results. The response rate (65.5%) was acceptable. Moreover, we used the CBCL as the validation criterion. The CBCL has been proven to be a well-validated questionnaire for behavioral and emotional problems. However, both the SDQ and the CBCL are completed by the parent, which could increase correlations slightly. Clinical assessments such as psychiatric interviews may provide additional information. Because of their complexity and high costs, they were not used as criteria in this study.

Children from immigrant origin were underrepresented in this study. Previous research has shown that CHPs have more difficulty in identifying psychosocial problems in immigrant children than in Dutch children.^{30,31} We therefore expect that the quality of identification in this study by CHPs (added value analyses) is actually somewhat worse than our data suggest.

Implications

Our results show that the SDQ can provide effective support for PCH in the identification of psychosocial problems among preschool-aged children.

The sample covered the entire Netherlands as the population and the data were collected during routine PCH practice, which supports the potential generalization of our results to the entire Netherlands. We expect that our results may be generalized to a wide range of countries, as the SDQ has been shown to be cross-culturally valid and is available in a broad range of languages.

Early detection of psychosocial problems only has value when it is followed by early

treatment in improving the prognosis for psychosocial problems. Examples of potentially effective (group-based) parenting programs for preschool-aged children are the Triple P-positive Parenting program^{32,33}, the Incredible Years Basic Parenting Program³⁴⁻³⁶ and the cognitive-behavioral Stop Think Ask Respond program.³⁷ These programs should be applied more often. Furthermore, more evidence needs to be collected about the long-term effectiveness of these programs.^{38,39}

Conclusion

The results of this study show that the SDQ 3-4 parent form is a useful aid for the early detection of psychosocial problems. The SDQ can provide effective support for PCH in the identification of psychosocial problems among preschool-aged children. This instrument is therefore a valid tool for routine use in PCH.

References

1. Brugman E, Reijneveld SA, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems by preventive child health care. *Arch Pediatr Adolesc Med.* 2001;155(4):462-469.
2. Leaf PJ, Alegria M, Cohen P, et al. Mental health service use in the community and schools: Results from the four-community MECA study. methods for the epidemiology of child and adolescent mental disorders study. *J Am Acad Child Adolesc Psychiatry.* 1996;35(7):889-897.
3. Feil E, Severson H, Walker H. Screening for emotional and behavioral delays: The early screening project. *Journal of Early Intervention.* 1998;21(3):252-265.
4. Durlak JA, Wells AM. Evaluation of indicated preventive intervention (secondary prevention) mental health programs for children and adolescents. *Am J Community Psychol.* 1998;26(5):775-802.
5. Geeraert L, Noortgate van den W, Grietens H, Onghena P. The effects of early prevention programs for families with young children at risk for physical child abuse and neglect: A meta-analysis. *Child Maltreat.* 2004;9(3):277-291.
6. Reijneveld SA, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems among toddlers in Dutch preventive child health care. *Arch Pediatr Adolesc Med.* 2004;158(8):811-817.
7. Klein Velderman M, Crone MR, Wiefferink CH, Reijneveld SA. Identification and management of psychosocial problems among toddlers by preventive child health care professionals. *Eur J Public Health.* 2010;20(3):332-338.
8. Vogels AG, Crone MR, Hoekstra F, Reijneveld SA. Comparing three short questionnaires to detect psychosocial dysfunction among primary school children: A randomized method. *BMC Public Health.* 2009;9(1):489.
9. Achenbach T, Rescorla L. *Manual for the ASEBA preschool forms and profiles.* Burlington: University of Vermont; 2000.
10. Ferdinand RF, Visser JH, Hoogerheide KN, et al. Improving estimation of the prognosis of childhood psychopathology; combination of DSM-III-R/DISC diagnoses and CBCL scores. *J Child Psychol Psychiatry.* 2004;45(3):599-608.
11. Koot HM, Van Den Oord EJ, Verhulst FC, Boomsma DI. Behavioral and emotional problems in young preschoolers: Cross-cultural testing of the validity of the child behavior Checklist/2-3. *J Abnorm Child Psychol.* 1997;25(3):183-196.

12. Goodman R. The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*. 1997;38:581-586.
13. Goodman R, Ford T, Simmons H, Gatward R, Meltzer H. Using the strengths and difficulties questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *British Journal of Psychiatry*. 2000;177:534-539.
14. Hawes DJ, Dadds MR. Australian data and psychometric properties of the strengths and difficulties questionnaire. *Aust N Z J Psychiatry*. 2004;38(8):644-651.
15. Koskelainen M, Sourander A, Kaljonen A. The strengths and difficulties questionnaire among finnish school-aged children and adolescents. *Eur Child Adolesc Psychiatry*. 2000;9(4):277-284.
16. Malmberg M, Rydell AM, Smedje H. Validity of the swedish version of the strengths and difficulties questionnaire (SDQ-swe). *Nord J Psychiatry*. 2003;57(5):357-363.
17. Mullick MS, Goodman R. Questionnaire screening for mental health problems in bangladeshi children: A preliminary study. *Soc Psychiatry Psychiatr Epidemiol*. 2001;36(2):94-99.
18. Woerner W, Becker A, Rothenberger A. Normative data and scale properties of the german parent SDQ. *Eur Child Adolesc Psychiatry*. 2004;13 Suppl 2:II3-10.
19. Crone MR, Vogels AG, Hoekstra F, Treffers PD, Reijneveld SA. A comparison of four scoring methods based on the parent-rated strengths and difficulties questionnaire as used in the Dutch preventive child health care system. *BMC Public Health*. 2008;8:106.
20. Muris P, Meesters C, van den Berg F. The strengths and difficulties questionnaire (SDQ)--further evidence for its reliability and validity in a community sample of dutch children and adolescents. *Eur Child Adolesc Psychiatry*. 2003;12(1):1-8.
21. van Widenfelt BM, Goedhart AW, Treffers PD, Goodman R. Dutch version of the strengths and difficulties questionnaire (SDQ). *Eur Child Adolesc Psychiatry*. 2003;12(6):281-289.
22. Byrne BM. *Structural equation modeling with AMOS. basic concepts, applications and programming*. Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc. Publishers; 2001.
23. Reijneveld SA, Vogels AG, Hoekstra F, Crone MR. Use of the pediatric symptom checklist for the detection of psychosocial problems in preventive child healthcare. *BMC Public Health*. 2006;6:197.
24. Vogels T, Reijneveld SA, Brugman E, den Hollander-Gijsman M, Verhulst FC, Verloove-Vanhorick SP. Detecting psychosocial problems among 5-6-year-old children in preventive child health care: The validity of a short questionnaire used in an assessment procedure for detecting psychosocial problems among children. *Eur J Public Health*. 2003;13(4):353-360.

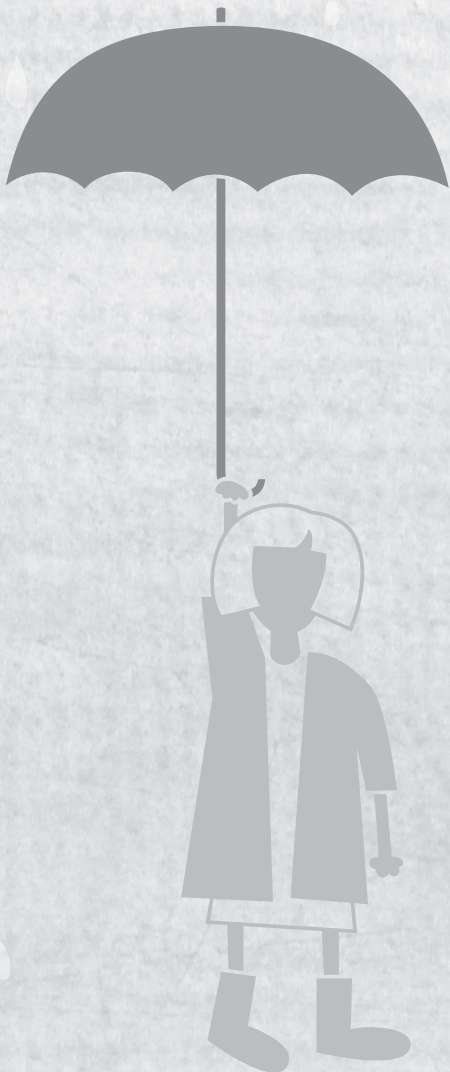
25. Briggs-Gowan MJ, Carter AS, Irwin JR, Wachtel K, Cicchetti DV. The brief infant-toddler social and emotional assessment: Screening for social-emotional problems and delays in competence. *J Pediatr Psychol*. 2004;29(2):143-155.
26. Squires J, Bricker D, Heo K, Twombly E. Identification of social-emotional problems in young children using a parent-completed screening measure. *Early Childhood Research Quarterly*. 2001;16:405-419.
27. Goodman A, Lamping DL, Ploubidis GB. When to use broader internalising and externalising subscales instead of the hypothesised five subscales on the strengths and difficulties questionnaire (SDQ): Data from british parents, teachers and children. *J Abnorm Child Psychol*. 2010;38(8):1179-1191.
28. Stone LL, Otten R, Engels RC, Vermulst AA, Janssens JM. Psychometric properties of the parent and teacher versions of the strengths and difficulties questionnaire for 4- to 12-year-olds: A review. *Clin Child Fam Psychol Rev*. 2010;13(3):254-274.
29. George D, Mallery P. *SPSS for windows step by step: A simple guide and reference*. 4th ed. Boston: Allyn & Bacon; 2003.
30. Crone MR, Bekkema N, Wiefferink CH, Reijneveld SA. Professional identification of psychosocial problems among children from ethnic minority groups: Room for improvement. *J Pediatr*. 2010;156(2):277-284.
31. Reijneveld SA, Harland P, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Psychosocial problems among immigrant and non-immigrant children--ethnicity plays a role in their occurrence and identification. *Eur Child Adolesc Psychiatry*. 2005;14(3):145-152.
32. Sanders MR. Triple P-positive parenting program as a public health approach to strengthening parenting. *J Fam Psychol*. 2008;22(4):506-517.
33. Sanders MR, Turner KM, Markie-Dadds C. The development and dissemination of the triple P-positive parenting program: A multilevel, evidence-based system of parenting and family support. *Prev Sci*. 2002;3(3):173-189.
34. Gross D, Fogg L, Webster-Stratton C, Garvey C, Julion W, Grady J. Parent training of toddlers in day care in low-income urban communities. *J Consult Clin Psychol*. 2003;71(2):261-278.
35. Gross D, Fogg L, Tucker S. The efficacy of parent training for promoting positive parent-toddler relationships. *Res Nurs Health*. 1995;18(6):489-499.
36. Hutchings J, Gardner F, Bywater T, et al. Parenting intervention in sure start services for children at risk of developing conduct disorder: Pragmatic randomised controlled trial. *BMJ*. 2007;334:678.

37. Nicholson BC, Janz PC, Fox RA. Evaluating a brief parental-education program for parents of young children. *Psychol Rep.* 1998;82(3):1107-1113.
38. Turner KM, Sanders MR. Help when it's needed first: A controlled evaluation of brief, preventive behavioral family intervention in a primary care setting. *Behav Ther.* 2006;37(2):131-142.
39. Barlow J, Smailagic N, Ferriter M, Bennett C, Jones H. Group-based parent-training programmes for improving emotional and behavioural adjustment in children from birth to three years old. *Cochrane Database Syst Rev.* 2010(3):CD003680.

Chapter 7

Punishment and reward in parental discipline for children aged 5 to 6 years: prevalence and groups at risk

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Submitted

Abstract

Objective

This study examines the use and predictors of different discipline practices by parents of children aged 5 to 6 years.

Study design

We obtained cross-sectional data for a nationally representative Dutch sample of children aged 5 to 6 years within the setting of routine well-child visits provided to the entire population. A total of 1630 children participated (response rate: 84%). Before the visit, parents completed a questionnaire with questions about their approach to discipline (punishment and rewards). χ^2 tests and logistic regression analyses were used to examine associations between discipline practices and child, parent and family factors.

Results

Parental punishment prevalence was 21.9% for spanking and 80.3% for other punishments practices, such as time-outs. The prevalence of rewards as a discipline strategy was 32.2% for granting privileges and 86.3% for cuddling/complimenting. Multivariate logistic regression analyses showed that spanking was more likely in families where the mothers have low and medium levels of education and in families of non-Dutch ethnicity. Other punishment practices (eg, time-outs, verbal reprimands and holding) were more likely in families of Dutch ethnicity. Granting privileges was more likely in families of non-Dutch ethnicity, who lived in large cities, whose income was below poverty level, in unemployed families and in small families. Cuddling and complimenting were more likely in families with a high maternal educational level, in families of Dutch ethnicity and in small families.

Conclusions

These findings show the importance of considering social and economic factors when identifying and supporting parents with parenting/rearing challenges.

Introduction

Good parenting is pivotal for the health and development of children.¹⁻⁴ An important aspect of parenting is the approach to discipline children. Parents may use various approaches: spanking or cuddling, for example. Generally, these approaches can be classified as either punishment or reward practices. “Punishment” means parental practices that aim to eliminate undesired behaviours. Examples are time-outs, removing privileges, yelling and spanking. Yelling and spanking have been described as aversive strategies by the American Academy of Pediatrics (AAP)⁵ because of the harmful effects.^{3,4,6} “Rewarding” means parental practices that aim to strengthen desired behaviours. Examples are cuddling, complimenting or granting privileges (watching TV, sweets, etc.).

Effective and efficient parenting support may benefit from information about the prevalence of different discipline practices. Studies of discipline practices have focused mainly on corporal punishment. These studies showed that parents particularly use corporal punishment, such as spanking, in children aged 2 to 3 years⁷ and in boys rather than girls.^{8,9}

Turning to parental and family characteristics, evidence shows that younger parents were more likely to use corporal punishment⁷⁻¹² and that lower socio-economic status,⁹ and marital status (unmarried)^{11,13} were associated with more frequent harsh disciplining. A fair amount of evidence suggests that African Americans used corporal punishment more often than Caucasian parents in the USA.^{6,9,11}

Little evidence has been obtained about discipline practices other than corporal punishment. We found 2 studies that investigated child, parent and family factors associated with the use of other punishment practices for young children (4-35 months¹¹ and 12-19 months¹⁰). The first study showed that parent frustration was associated with more use of toy removal, time-outs and explaining. Parental ethnicity (Spanish-speaking Hispanic ethnicity compared to Caucasian parents in the USA) was associated with less use of toy removal and time-outs.¹¹ The second study showed that marital status, income and education were not predictors of any discipline practices such as verbal communication, removing privileges, time-out or ignoring.¹⁰ Studies of reward as a discipline strategy are entirely lacking.

The main aim of this study was to investigate the prevalence and predictors (child, parent and family factors) of different discipline practices in parents of children aged 5 to 6 years. We oversampled ethnic minorities in order to make a proper assessment of the associations with ethnicity.

Methods

Data were collected between October 2002 and May 2003 within the framework of the routine preventive health assessments that are provided regularly to all Dutch children. The local Medical Ethics Committee approved the study.

Sample

The sample was obtained in a 2-stage procedure. In the first stage, a random sample of 15 Dutch Child Healthcare Services was taken from a total of 40 services. In the second, each Child Healthcare Service provided a random sample of about 100 children for the age group 5 to 6 years (2nd year of elementary school). Child Healthcare Services in 2 large cities were each asked to provide an additional sample of 200 children from the largest ethnic minority groups in the Netherlands: Moroccan, Turkish, Surinam, and Antillean. Of the 1939 children (ages 5 and 6 years) who were eligible, 1630 participated (response rate: 84%). Analyses were limited to children with complete parent-reported data. We were left with a sample of 1399 children (ages 5 and 6 years). The sample was representative of the total sample and representative of the Dutch population in terms of age, gender and ethnicity.

Procedure

A questionnaire was mailed to parents along with the standard invitation for the preventive health assessment routinely offered to all Dutch children. This questionnaire included questions about discipline practices. The completed questionnaire was returned to the Child Healthcare Physician (CHP) in a sealed envelope.

The CHP then took a routine history and physically assessed each child. The CHP recorded the background characteristics of the child and its family: ethnicity, child age and gender, parental educational level, employment status and age, family composition, family income, number of siblings and urbanisation. The country of birth of the parents was taken as the determinant of ethnic status. The educational level of each parent was the highest degree obtained by that parent. Family composition focused on the number of parents in the family (2 parents or 1 parent). Family income was categorised as below/at poverty level or higher. Employment was defined as having at least 1 parent working. Urbanisation was categorised as small/rural town or large city.

Questionnaire

Data about discipline practices were obtained with 2 questions in the questionnaire. Parents were asked to indicate practices they generally used to punish or reward their

child. The first question was: “Which discipline practices do you apply if your child needs to be punished?” Parents had the following answer options: spanking (ie slapping), holding, time-out, sending out of the room/separating, standing in the corner, withholding something (sweets, for instance), verbal reprimands or other. The second question was “Which discipline practices do you generally apply to reward your child?”. Parents had the following answer options: cuddling, sweets, presents, staying up longer, watching TV, promise of an outing, complimenting or other. Parents were allowed to give multiple answers to each question. Each answer option will be referred to here as an “item”.

Analyses

To classify the punishment and rewarding practices mentioned in the questionnaire, a Homogeneity Analysis by Means of Alternating Least Squares (HOMALS) was conducted. Items with a discrimination value $> .30$ on the resulting dimensions were grouped as separate disciplining strategies. The analyses resulted in the punishment dimensions “spanking” (a single item: spanking) and “other punishment” (items: time-out, verbal reprimands and holding), and the reward dimensions “cuddling/complimenting” (items: cuddling and complimenting) and “granting privileges” (items: giving presents, watching TV and promise of an outing). Items from each dimension were summed to create scales (strategies). Each parent answering the questionnaire was classified as low or high on each strategy, using its median value as cut-off point. We then assessed the prevalence of each of the discipline strategies as identified.

Secondly, we assessed differences in child, parent and family characteristics for each strategy (eg granting privileges: low or high) using χ^2 tests and the Cohen effect size index w . Finally, we performed bivariate and multivariate logistic regression analyses to assess which characteristics were related to the use of punishment and reward strategies. Child, parent and family characteristics were included as predictors.

Results

Demographics

Of all children, 23.4% were of non-Dutch ethnicity (ie, at least 1 parent born outside the Netherlands). Further demographic information is presented in Table 1.

Table 1. Demographic characteristics of the participating children (n = 1399)

	n	%
Gender		
Boy	705	50.4
Girl	694	49.6
Child's age (y)		
5	813	58.1
6	586	41.9
Family composition		
2-parent family	1253	89.6
1-parent family	121	8.6
Other/unknown	25	1.8
Employment status		
Unemployed	65	4.6
Employed	1221	87.3
Unknown	113	8.1
Maternal educational level		
Low	543	38.8
Medium	490	35.0
High	333	23.8
Unknown	33	2.4
Paternal educational level		
Low	511	36.5
Medium	421	30.1
High	368	26.3
Unknown	99	7.1
Family size		
1 child	201	14.4
2 children	696	49.7
3 and > children	502	35.9
Family income		
Below poverty	179	12.8
Above poverty	1035	74.0
Unknown	185	13.2
Urbanisation		
Rural/small town	1073	76.7
Big city	326	23.3
Maternal age (y)		
<27	288	20.6
27-33	751	53.7
34+	353	25.2
Unknown	7	0.5
Paternal age (y)		
<27	122	8.7
27-33	651	46.5
34+	582	41.6
Unknown	44	3.1
Ethnicity		
Dutch	1057	75.6
Migrant	327	23.4
Unknown	15	1.1

Prevalence of punishment and rewards as discipline strategies

Table 2 shows that most parents (78.1%) did not use spanking as a general strategy to discipline their child. Many parents (80.3%) used at least 1 of the “other punishment practices” such as time-out, verbal reprimands or holding. The majority of the parents (86.3%) used cuddling and compliments to reward their child. A sizable minority (32.2%) used at least 1 of the practices of the strategy “granting privileges” such as “giving presents, watching TV and promise of an outing” to discipline their child.

Table 2. Prevalence of discipline practices (n = 1399)

	n	%	= > median
Spanking (0 - 1)*			21.9%
0	1093	78.1	
1	306	21.9	
Other punishment practices(0 - 3)**			22.5%
0	275	19.7	
1	809	57.8	
2	306	21.9	
3	9	0.6	
Cuddling/complimenting (0 - 2)***			86.3%
0	36	2.6	
1	156	11.2	
2	1207	86.3	
Granting privileges (0 - 3)****			32.2%
0	949	67.8	
1	318	22.7	
2	105	7.5	
3	27	1.9	

Discipline practices that are included:

- * Spanking
- ** Time-out, verbal reprimands and holding
- *** Cuddling, complimenting
- **** Giving presents, watching TV and promise of an outing

Characteristics affecting discipline strategies: bivariate analyses

Tables 3 and 4 present the characteristics associated with punishment and rewards. Many characteristics were significantly associated with a parental discipline strategy, but most effect sizes were small (Cohen $w < .10$). Only characteristics with a significant relationship and a Cohen $w > .10$ were classified as effects. Table 3 shows the characteristics associated with punishment strategies. Spanking was more likely in families of non-Dutch ethnicity and with low-educated mothers. Other punishments practices (eg time-out, verbal reprimands and holding) were more likely in families of Dutch ethnicity.

Table 4 shows the factors associated with rewarding strategies. The strategy “cuddling and complimenting” was more likely in families with a high maternal and paternal educational

level, with an income above poverty level, living in small/rural towns and of Dutch ethnicity. The strategy “granting privileges” was more likely in families of non-Dutch ethnicity, with an income below poverty level, living in large cities and in small families (1 child).

Characteristics affecting discipline strategies: multivariate analyses

Table 5 presents the results of the stepwise logistic regression analyses. In multivariate analyses, low and medium maternal educational level and non-Dutch ethnicity were independently associated with the use of spanking. Dutch ethnicity was independently associated with the use of other punishment practices (eg, time-out, verbal reprimands and holding).

High maternal educational level, Dutch ethnicity and small families (1 or 2 children as opposed to 3 or more) were independently associated with the use of cuddling and complimenting. Non-Dutch ethnicity, living in large cities, an income below poverty level, employment and small family size (1 or 2 children as opposed to 3 or more) were independently associated with granting privileges.

Table 3: Prevalence of punishment strategies by child, parent and family characteristics (n = 1399)

	Spanking		Other punishments	
	=> median n (%)	Cohen effect size index w	=> median n (%)	Cohen effect size index w
Gender		.04		.05
Boy	165 (23.4)		173 (24.5)	
Girl	141 (20.3)		142 (20.5)	
Child's age (y)				
5	188 (23.1)	.04	200 (24.6)	.06*
6	118 (20.1)		115 (19.6)	
Family composition				
2-parent family	276 (22.0)	.01	284 (22.7)	.02
1-parent family	28 (23.1)		24 (19.8)	
Employment status		.02		.08**
Unemployed	16 (24.6)		5 (7.7)	
Employed	262 (21.5)		282 (23.1)	
Maternal educational level		.14**		.09**
Low	150 (27.6)		102 (18.8)	
Medium	103 (21.0)		135 (27.6)	
High	42 (12.6)		76 (22.8)	
Paternal educational level		.07*		.07*
Low	128 (25.0)		101 (19.8)	
Medium	81 (19.2)		97 (32.4)	
High	68 (18.5)		101 (27.4)	
Family size		.02		.05
1 child	43 (21.4)		36 (17.9)	
2 children	147 (21.2)		157 (22.6)	
3 and > children	116 (23.1)		122 (24.3)	
Family income		.07*		.07*
Below poverty	50 (27.9)		29 (16.2)	
Above poverty	210 (20.3)		247 (23.9)	
Urbanisation		.08**		.10**
Rural/small town	216 (20.1)		267 (24.9)	
Large city	90 (27.6)		48 (14.7)	
Maternal age (y)		.07*		.05
<27	78 (27.1)		53 (18.4)	
27-33	150 (20.0)		177 (23.6)	
34+	74 (21.0)		84 (23.8)	
Paternal age (y)		.02		.01
<27	30 (24.6)		28 (23.0)	
27-33	142 (21.8)		143 (22.0)	
34+	122 (21.0)		135 (23.2)	
Ethnicity		.17**		.19**
Dutch	191 (18.1)		285 (27.0)	
Migrant	112 (34.3)		28 (8.6)	

* $P < .05$ ** $P < .01$

Cohen w: low = .1, medium = .3 and high = .5.

Unknown category of each variable is not included in the analyses.

Table 4: Prevalence of reward strategies by child, parent and family characteristics

	Cuddling and complimenting		Granting privileges	
	=> median n (%)	Cohen effect size index w	=> median n (%)	Cohen effect size index w
Gender				
Boy	599 (85.0)	.04	234 (33.2)	.02
Girl	608 (87.6)		216 (31.1)	
Child's age (y)		.02		.01
5	697 (85.7)		266 (32.7)	
6	510 (87.0)		184 (31.4)	
Family composition		.02		.07*
2-parent family	1083 (86.4)		393 (31.4)	
1-parent family	101 (83.5)		51 (42.1)	
Employment status		.10**		.07*
Unemployed	47 (72.3)		29 (44.6)	
Employed	1066 (87.3)		373 (30.5)	
Maternal educational level		.23**		.09**
Low	417 (76.8)		200 (36.8)	
Medium	447 (91.2)		142 (29.0)	
High	314 (94.3)		93 (27.9)	
Paternal educational level		.14**		.06
Low	414 (81.0)		177 (34.6)	
Medium	373 (88.6)		119 (28.3)	
High	338 (91.8)		110 (29.9)	
Family size		.07*		.11**
1 child	172 (85.6)		83 (41.3)	
2 children	616 (88.5)		235 (33.8)	
3 and > children	419 (83.5)		132 (26.3)	
Family income		.12**		.17**
Below poverty	139 (77.7)		93 (52.0)	
Above poverty	923 (98.2)		306 (29.6)	
Urbanisation		.14**		.20**
Rural/small town	955 (89.0)		290 (27.0)	
Large city	252 (77.3)		160 (49.1)	
Maternal age (y)		.08**		.10**
<27	233 (80.9)		118 (41.0)	
27-33	663 (55.2)		234 (31.2)	
34+	306 (86.7)		97 (27.5)	
Paternal age (y)		.06		.08*
<27	98 (80.3)		48 (39.3)	
27-33	573 (88.0)		221 (33.9)	
34+	503 (86.4)		163 (28.0)	
Ethnicity		.25**		.24**
Dutch	964 (91.2)		272 (25.7)	
Migrant	231 (70.6)		172 (52.6)	

* $P < .05$ ** $P < .01$

Cohen effect size index w: low = .1, medium = .3 and high = .5.

Unknown category of each variable is not included in the analyses.

Table 5. Associations of background characteristics with discipline strategies: results of four separate stepwise logistic regression analyses ($n = 1022$). Odds ratio (OR) and 95% confidence interval.

	Punishment		Rewards	
	Spanking	Other punishment practices (time out, verbal reprimands and holding)	Cuddling and complimenting	Granting privileges
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Ethnicity				
Dutch	Reference	Reference	Reference	Reference
Migrant	1.86 (1.31-2.64)**	0.27 (0.16-0.44)**	0.26 (0.18-0.40)**	2.60 (1.80-3.74)**
Maternal educational level				
Low	2.00 (1.32-3.02)**		0.26 (0.14-0.47)**	
Medium	1.59 (1.04-2.42)**		0.55 (0.29-1.05)	
High	Reference		Reference	
Family size				
1 child			1.14 (0.63-2.06)	1.71 (1.10-2.65)*
2 children			1.70 (1.11-2.61)*	1.50 (1.10-2.06)*
3 and > children			Reference	Reference
Urbanisation				
Rural/small town				Reference
Large city				1.45 (1.01-2.07)**
Income				
Below poverty				2.32 (1.37-3.94)**
Above poverty				Reference
Employment status				
Unemployed				0.30 (0.13-0.72)**
Employed				Reference

* $P < .05$

** $P < .01$

Discussion

The results of this study show that 22% of all parents of children aged 5 to 6 years used spanking as a general strategy to punish their child. The majority of the parents also used other practices to punish their child, such as time-outs, verbal reprimands, and holding. As rewards, most parents generally used the strategy “cuddling and complimenting” rather than the strategy “granting privileges”. Characteristics closely associated with punishment strategies were ethnicity and maternal educational level. Characteristics closely associated with reward strategies were ethnicity, maternal educational level, family size, urbanisation, family income and employment status.

Child, parent and family factors and discipline practices

We found that the strategies spanking (to punish) and granting privileges (to reward) were more frequently used in families characterised by a number of indicators of societal adversity such as low income, low educational level, immigrant status and unemployment. Regalado et al.¹¹ and Socolor et al.¹⁰ found similar risk groups associated with spanking in the USA. Similar risk groups were found for child maltreatment. The Dutch¹⁴ and international¹⁵ literature shows that groups at the highest risk for child maltreatment are immigrant and unemployed parents. This may be because type of discipline strategy is an important risk factor for child maltreatment.

Discipline strategies may reflect a more general parenting style and parenting skills. It seems likely that aversive disciplining, for example, probably reflects a more authoritative style.¹⁶ This style is more often found in parents with low SES, and immigrant status. It is, however, also very likely that limited coping skills are a relevant factor for the use of aversive parent strategies. Other factors that may explain the relation between indicators of societal adversity and aversive parent strategies are cultural differences and living in an adverse situation that may lead to pressure and stress and, in turn, to harsh discipline.

Strengths and limitations

Our study had several strengths. The response rate was high and the sample covered the entire Dutch population, limiting the likelihood of selective response.

Some limitations should also be taken into account when interpreting our findings. First, discipline practices were assessed by self-report, which may lead to bias as parents give socially-acceptable responses. However, we expect this effect to be small because parental responses were collected anonymously but we have almost certainly underestimated the prevalence rates of practices like spanking to some extent. Secondly, the context (ie the situation, such as specific misbehaviour of the child) of discipline strategies is an important factor and was not assessed. The final limitation is that we did not measure the frequency with which the discipline practices were used. For example, we asked about 'Which discipline practices do you generally apply if your child needs to be punished?'. Additional research is needed to obtain data about frequency, but it should be realised that such data are probably sensitive to various types of information bias.

Implications

Given the evidence of the harmful effect of aversive disciplining, supporting parents in alternative discipline styles is of great practical significance.^{3,6} Parents who are struggling with the demands of child rearing may be helped by a variety of parenting programmes,

such as the Triple P-positive Parenting programme.¹⁷ Preventive, primary and secondary care can play important roles in identifying this need and in facilitating access to services that provide such parenting support. Given the sensitive nature of this topic, improvements may be required in professionals' communication techniques.¹⁸

Moreover, our findings show that spanking is still prevalent in a large group of parents, with a preponderance of risks factors in deprived settings. Preventive, primary and secondary care should pay more attention to these risk groups in order to eliminate the use of aversive discipline strategies and child abuse for these children.

References

1. Dekovic M, Janssens JM, Van As NM. Family predictors of antisocial behavior in adolescence. *Fam Process*. 2003;42(2):223-235.
2. O'Connor TG. Annotation: The 'effects' of parenting reconsidered: Findings, challenges, and applications. *J Child Psychol Psychiatry*. 2002;43(5):555-572.
3. Gershoff ET. Corporal punishment by parents and associated child behaviors and experiences: A meta-analytic and theoretical review. *Psychol Bull*. 2002;128(4):539-579.
4. Taylor CA, Manganello JA, Lee SJ, Rice JC. Mothers' spanking of 3-year-old children and subsequent risk of children's aggressive behavior. *Pediatrics*. 2010;125(5):e1057-65.
5. American Academy of Pediatrics, Committee on Psychosocial Aspects of Child and Family Health. Guidance for effective discipline. *Pediatrics*. 1998(101):723-728.
6. Straus MA, Stewart JH. Corporal punishment by American parents: National data on prevalence, chronicity, severity, and duration, in relation to child and family characteristics. *Clin Child Fam Psychol Rev*. 1999(2):55-70.
7. Wissow LS. Child discipline in the first three years of life. In: Halfon N, McLearn K.T., Schuster MA, eds. *Child Rearing in America: Challenges Facing Parents with Young Children*. New York, NY: Cambridge University Press; 2002:146-177.
8. Wissow LS. Ethnicity, income, and parenting contexts of physical punishment in a national sample of families with young children. *Child Maltreat*. 2001;6(2):118-129.
9. Berlin LJ, Ispa JM, Fine MA, et al. Correlates and consequences of spanking and verbal punishment for low-income white, African American, and Mexican American toddlers. *Child Dev*. 2009;80(5):1403-1420.
10. Socolar RR, Savage E, Keyes-Elstein L, Evans H. Factors that affect parental disciplinary practices of children aged 12 to 19 months. *South Med J*. 2005;98(12):1181-1191.
11. Regalado M, Sareen H, Inkelas M, Wissow LS, Halfon N. Parents' discipline of young children: Results from the national survey of early childhood health. *Pediatrics*. 2004;113(6):1952-1958.
12. Eamon MK. Antecedents and socioemotional consequences of physical punishment on children in two-parent families. *Child Abuse Negl*. 2001;25(6):787-802.
13. Loeber R, Drinkwater M, Yin Y, Anderson SJ, Schmidt LC, Crawford A. Stability of family interaction from ages 6 to 18. *J Abnorm Child Psychol*. 2000;28(4):353-369.
14. Reijneveld SA, de Meer G., Wiefferink CH, Crone MR. Detection of child abuse by Dutch preventive child-healthcare doctors and nurses: Has it changed? *Child Abuse Negl*. 2008;32(9):831-837.

15. UNICEF A. *A League Table of Child Maltreatment Deaths in Rich Nations*. Florence: UNICEF Innocenti Research Centre; 2003.
16. Deković M, Janssens JM. Parents' child-rearing style and child's sociometric status. *Developmental Psychology*. 1992;28(5):925-932.
17. Sanders MR. Triple P-positive parenting program as a public health approach to strengthening parenting. *J Fam Psychol*. 2008;22(4):506-517.
18. Wissow LS, Roter DL, Wilson ME. Pediatrician interview style and mothers' disclosure of psychosocial issues. *Pediatrics*. 1994;93(2):289-295.

Chapter 8

General discussion



General Discussion

The main aim of this thesis was to investigate the early detection of psychosocial problems in children aged 6 months to 6 years by Preventive Child Healthcare (PCH). It focuses in particular on the quality of detection and on the degree to which short questionnaires can improve this detection by PCH. An additional aim was to investigate the predictors (child, parent and family factors) of various discipline practices in parents. This information may support PCH to identify groups at risk for the use of aversive disciplining practices.

The following research questions were answered:

1. What is the quality of identification of psychosocial problem by preventive child healthcare professionals (CHPs) in children aged 5-6 years? Has the quality improved after a series of nationwide interventions?
2. Does the proportion of children identified as having psychosocial problems vary between individual CHPs? If yes, could this variation be explained by CHP characteristics, such as work experience? Are CHP characteristics related to the quality of problem identification by CHPs?
3. What are the psychometric properties of a number of short questionnaires (KIPPP, ASQ:SE, BITSEA, SDQ) that PCH can use in the identification of psychosocial problems in preschool children and could these questionnaires improve the identification by CHPs? There is a major focus at the SDQ, because many PCH services use this questionnaire for school-age children.
4. What are the prevalence rates and predictors (child, parent and family factors) of different discipline practices in parents of children aged 5-6 years?

This general discussion integrates the findings of the reported studies and discusses their contribution to the field of PCH practice. Subsequently methodological limitations will be discussed and attention will be paid to practical and research implications of the studies.

Main findings

Ad 1. What is the quality of identification of psychosocial problems by CHPs?

In Chapter 2 we showed that identification of psychosocial problems was much more likely in children with an elevated Child Behavior Checklist (CBCL) score. Despite this, CHPs failed to identify psychosocial problems in 42-47% of the children aged 5 to 6 years

for which parents reported problems on the CBCL. Furthermore, 18-26% of the children with no problems on the CBCL were identified as having psychosocial problems by the CHP. Contrary to our expectation, the quality of problem identification by CHPs did not improve after several nationwide interventions, such as the development and validation of several short questionnaires and training for CHPs throughout the country to improve their diagnostic skills.

Ad 2. Individual differences between CHPs

In Chapter 3 we showed that CHPs varied widely in the proportion of children identified as having psychosocial problems. CHP characteristics such as work experience and work style (for example, on indication use of behavior questionnaires like the CBCL in routine care) explained about a quarter of this inter-CHP variation; child characteristics did not. On indication use of the CBCL and of the Teacher Report Form (TRF) in routine care was associated with better and worse agreement between CHP identification and parent-report on the CBCL, respectively. Work experience was not related to the quality of problem identification, though it explained some of the variation.

Ad 3. Can short parent-reported questionnaires improve the identification of psychosocial problems by CHPs?

In Chapters 4, 5 and 6 we evaluated a number of short questionnaires and determined whether these questionnaires could improve the identification of psychosocial problems by CHPs. We found that at the age of 6 months (KIPPPPI, ASQ:SE) and 14 months none of the instruments studied (KIPPPPI, ASQ:SE, BITSEA) was a good indicator of problems as measured by the CBCL at age 18 months. At the age of 2 years, only the BITSEA discriminated appropriately between children with and without problems, and not the ASQ:SE and the KIPPPPI. In addition, the BITSEA at this age offered most added value in the identification of psychosocial problems by CHPs compared to identification based on clinical assessment alone. Separate analyses on the BITSEA showed that sensitivity and specificity were 0.84 and 0.91, respectively. The internal consistency of the BITSEA problem score was good (Cronbach's alpha 0.79)

Out of a series of questionnaires aiming at children aged 3-4 years (ASQ:SE, SDQ and KIPPPPI) only the SDQ discriminated sufficiently between children with and without problems. Furthermore, all questionnaires aiming at children aged 3-4 years improved the identification by PCH, but the SDQ added most to the identification of psychosocial problems by CHPs. Separate analyses on the SDQ showed that sensitivity and specificity were 0.79 and 0.93, respectively. The internal consistency of the SDQ total difficulties

score was good (Cronbach's alpha 0.78), but it was worse for some subscales of the SDQ.

Ad 4. Prevalence and predictors of different discipline practices.

In Chapter 7 we showed that the prevalence of punishment as discipline strategy was 21.9% for spanking and 80.3% for other punishment practices, such as time-outs. The prevalence of giving rewards as a discipline strategy was 32.2% for granting privileges and 86.3% for cuddling/complimenting. We found that some aversive punishment and rewarding strategies, such as spanking and granting privileges, were used more frequently in families characterized by a relatively deprived societal position, ie having a low income, low educational level, immigrant status and unemployment. More non-aversive punishment and rewarding strategies such as time-out/verbal reprimands and cuddling/complimenting were used more frequently in families of Dutch ethnicity, in small families and in families with a highly educated mother.

Discussion of the main findings

Quality of identification of psychosocial problems by CHPs

Our results showed that the quality of early detection of psychosocial problems in children aged 5 to 6 years by CHPs did not improve in the period 1997-2003. CHPs failed to identify many children with serious psychosocial problems and many children were falsely identified with problems. We also found that the proportion of children aged 5 to 6 years identified as having problems varied widely between individual CHPs, which again indicates that there is room for improvement regarding the identification of psychosocial problems by CHPs. Our findings confirm evidence on younger (21 months to 4 years) and older children (5 to 15 years).¹⁻³

These findings were based on data regarding 5 to 6-year-olds that had been collected in the period 1997-2003. The identification of psychosocial problems by CHPs among children aged 5-6 years might have been improved since then. However, this is not very likely, as since then almost no activities have been organized at national level that aimed at improvement and focused on this particular age-group. Most efforts to improve the problem identification by CHPs since 2003 have been targeted at older age groups. For example, in 2005 findings have been published on the validity and added value of the SDQ questionnaire among children aged 7-12 years in the Netherlands.⁴ These findings were that the SDQ is a valid tool for the identification of problems in 7-12 years old children. Consequently many PCH services implemented this questionnaire for the routine

examination at the age 10-11 years. This implementation was supported by a schooling program, offered to all CHP-physicians on how to use the SDQ in practice.

For the routine examination at the age 5-6 years no validated *parent reported* questionnaires with proven *good* psychometric properties were available, and thus nothing has been implemented either. However, given the good validity of the SDQ among children aged 7-12 years several PCH services decided to use the SDQ for the routine examinations at the age 5-6 years. They did this even though no validation studies were available for use of the SDQ in this age group in Dutch PCH, and neither were, by consequence, suitable cut-off points. Other PCH services continued to use the LSPPK questionnaire, despite evidence that its validity and added value was limited.⁵ Apparently, this rather unstructured approach is unlikely to have led to major gains in the quality of identification in PCH of psychosocial problems among children aged 5-6 years.

Our findings on inter-professional variation indicate that some initiatives may improve the quality of the identification of psychosocial problems. In Chapter 3 we showed that systematic working (such as the use of high quality questionnaires like the CBCL) reduces the variation between CHPs in the proportion of children identified as having a problem. Systematic working may also improve the overall quality of psychosocial problem detection by CHPs. Moreover, in Chapters 4, 5 and 6 we showed that the use of short parent-reported questionnaires with good psychometric properties may improve the quality of problem detection by CHPs in preschool children except for the very youngest age-groups. Further improvement of questionnaires aiming at children aged 5-6 years may thus add to the quality of identification as well.

Short questionnaires aiming at preschool children for the detection of psychosocial problems: KIPPPI, ASQ:SE, BITSEA, SDQ

We compared the psychometric properties (internal consistency, scale structure and validity) and the added value of several parent-reported questionnaires (KIPPPI, ASQ:SE, BITSEA, SDQ) for the identification of psychosocial problems among preschool children by PCH. Our findings showed that at the ages of 6 and 14 months none of the instruments that we studied (KIPPPI, ASQ:SE and BITSEA) was a good indicator of problems as measured by the CBCL. At the age of 2 years only the BITSEA was a valid tool to support the identification of psychosocial problems, whereas the ASQ:SE and the KIPPPI were not. In children aged 3-4 years only the SDQ was a valid tool to support the identification of psychosocial problems but the KIPPPI and the ASQ:SE were not.

We found that none of the tested questionnaires could appropriately help in the identification by PCH of problem behaviour in children aged 6 and 14 months. An

explanation may be that it is difficult for parents and professionals to assess problem behaviors in young infants because the child's problem behavior may not be fully developed at such ages.⁶ On the other hand, the Diagnostic Classification 0-3, in which the fifth axis refers to the child's emotional and social functioning, indicates that problem behaviour can be assessed in a reliable way in young children.⁷ An explanation for this discrepancy might be that such an assessment needs more intensive procedures than short parent-reported questionnaires. This explanation is supported by a Dutch study in which the longer questionnaire (ITSEA-NL) was used in the same age group. Its findings showed that parent-reported problem behaviour was related to CHP identification of psychosocial problems at the age of 14 months.⁸ Although this in itself is no proof of the validity –the identification by CHP is apparently not perfect^{1,2,9}– it could mean that longer questionnaires may be useful. Other methods, such as observation, information from other sources and so on, may be added.

A second explanation why none of the tested questionnaires could help in the identification of psychosocial problems by PCH in children aged 6 and 14 months is related to our study design. There was a time interval of up to 12 months between filling in tested questionnaire and the CBCL criterion, because the CBCL can only be used for children older than 18 months. Psychosocial problems assessed at age 6 and 14 months may have changed or even disappeared 12 months later. However, if this is the case, the utility of identification of problems at a young age seems limited, as these problems than disappear without professional help. This raises the question whether psychosocial problems are stable throughout the first two years.

Our validation study showed that for other ages some questionnaires (ie, the BITSEA and SDQ) improved the problem identification of preschool children by CHPs. However, this may not hold for daily PCH practice because of two reasons, both related to a potentially less than perfect implementation in daily practice. First, the questionnaires may not be used as they should be used. For instance, the used cut-off points deviate from validation studies, or the phrasing of questions may be changed. Remarks from CHPs make it clear that both deviations seem to occur in routine practice in PCH. Even minor changes can seriously impair the validity of a questionnaire.¹⁰ Therefore, increased attention should be paid to the implementation and the correct use of these questionnaires in daily practice in order to improve the identification of children with psychosocial problems.

Second, the psychometric properties of the parent-report questionnaires (Chapters 4, 5 and 6) were investigated within the traditional setting of PCH. In this traditional setting all children were examined by a PCH nurse or physician, in the presence of parents. Currently this approach is evolving into a triage-based one. In such a triage-based approach, short

questionnaires are used as a first step in identification. Children who score above a given cut-off are invited for an assessment by PCH nurses or physicians. Parental completion of the questionnaires may differ between triage-based and traditional approaches, because parents know in a triage-based setting that a further contact will depend on the way in which they fill in the questionnaire.

Parental discipline practices

Disciplining is a core issue in parenting, in addition to providing a safe and affectionate environment. Parental failure in disciplining, further called inadequate parenting, is related with (pre)school behavior problems.^{11,12} Early detection of inadequate parenting may thus prevent or improve the prognosis of emotional and behavior problems among children. One aspect of inadequate parenting is the use of aversive discipline practices, like spanking. Currently, identifying aversive disciplining practices receives little attention by PCH, maybe due to the sensitive nature of the topic. This concurs with previous findings that PCH detected relatively few cases of child abuse and maltreatment in the past.¹³ Another reason may be that information is lacking about how to identify parents at risk for aversive discipline practices.

We found that aversive discipline practices were more frequently used in families characterized by a relatively deprived societal position, such as having a low income, low educational level, immigrant status and unemployment. These risk groups are similar to those found for child maltreatment.^{13,14} An explanation may be that some disciplining approaches, like spanking, may easily lead to child maltreatment (and are even considered already to be maltreatment by some). Our findings, combined with those of other studies^{13,15} may help to develop profiles of parents who are at risk for the use of aversive discipline practices and child maltreatment. This may help PCH to efficiently identify parents at risk.

Methodological considerations

Samples

Strengths of this thesis are that all studies covered the entire Netherlands and that in general response rates were high, limiting the likelihood of selective response. However, children from immigrant origin were underrepresented in studies 4, 5 and 6 (ie, the studies on the validity of short questionnaires). This may be explained by immigrant parents being less able to respond due to eg language problems (the questionnaires were in Dutch). Another explanation may be that only one of the four biggest Dutch cities participated.

Most immigrant children are living in a large city and only one of the participating PCH services was located in such a city. Previous research has shown that CHPs have more difficulty in identifying psychosocial problems in immigrant children than in Dutch children.^{16,17} It therefore seems likely that the quality of identification by CHPs will be worse if more children of immigrant origin were included. Moreover, other characteristics of the professional and his or her work style and experience may be associated with better identification, eg cultural background or training in culturally differing expression of psychosocial problems.

Quality of data collection: criteria and instruments

In almost all studies, we used treatment status and elevated scores on the CBCL as criteria to assess the quality of detection of psychosocial problems by CHPs or the validity of short questionnaires used as a method to identify children with psychosocial problems. When using treatment status as criterion we found lower validity indices for all questionnaires compared to an elevated CBCL score. Similar results were found in previous research,¹⁸⁻²⁰ which is not surprising: children with psychosocial problems often do not receive treatment²¹, for instance because problems were not identified or because parents were able to cope with the problems without professional support. Furthermore, some children without psychosocial problems actually receive treatments which parents report to be due to child psychosocial problems. This may for instance be due to the parents have parenting difficulties. Children of parents who are less competent in facing child rearing challenges, may be referred more often to mental health services, also when no really serious psychosocial problems exist.

Besides treatment status we also used an elevated CBCL score as criterion in the validation of the short questionnaires. Using the CBCL as criterion is a widely used approach, especially in community-based screening.²² We used the CBCL because it has been found to be highly reliable and valid, in all age groups and among many countries and cultures.²³⁻²⁵ The use of the CBCL as criterion is not perfect, however; there are two aspects that must be considered. First, we used the revised CBCL (CBCL 1.5-5) although no Dutch cut-off points were available. Routinely, cut-off for elevated scores on these questionnaires is set at 10%, with those scoring above the cut-off denoted as having psychosocial problems.²⁶ Many studies found this cut-off to be different for the Netherlands compared to the USA.^{26,27} Using the USA cut-offs for the CBCL in the Netherlands, mostly leads to much lower prevalence estimates,²¹ which may affect the agreement between the short instruments and the CBCL criterion. Second, the use of the CBCL as criterion measure was sometimes criticized by PCH-workers because they consider it to be an instrument focusing on

psychiatric disorders, while it does not measure less severe behavioral and emotional problems. The CBCL is developed in the context of child psychiatry, but this instrument also measures an unhealthy development such as social problems. Furthermore, in an expert meeting on PCH and Psychosocial Problems in 1999 it was agreed that the early detection of psychosocial problems should focus on emotional and behavior problems and problems on school, implying that factors contributing to or causing the development of psychosocial problems were excluded.

Other validation criteria may be clinical assessments (for example psychiatric interviews). However, we did not use these because they are expensive and time consuming and therefore not appropriate for screening a large scale population. Clinical assessments are therefore mostly restricted to smaller samples, for example children identified by screening procedures.

Another limitation regarding the quality of our studies concerns the method used to assess parental disciplining practices in Chapter 7. This was based on questions filled in by parents on their own behavior. Such questions have been criticized as being sensitive to bias because parents may tend to give socially-acceptable responses.²⁸ Moreover, parents may forget pertinent details.²⁸ In order to confirm the validity of our findings, this study should therefore preferably be replicated based on other informants, eg by use of observation. It should be realized, however, that such alternative methods of data collection may also be biased by effects of social desirability.

Generalizability

Our findings are likely to be generalizable to routine practice in Dutch PCH, at least regarding native Dutch children. All studies have been based on data collected in this routine practice of PCH. This represents the setting where the identification of psychosocial problems actually takes place and where short questionnaires will be used. Furthermore, our findings may be generalized easily to the entire Netherlands, because we collected data from PCH services throughout the country. We think that our results may be generalized to other countries too, especially to countries that have a similar preventive child healthcare system (for example, USA, Dutch-speaking Belgium).

However, the generalizability of our findings to non-native children deserves additional study. In the studies described in Chapters 2 and 3 we excluded these non-native children (ie those with at least one parent born outside the Netherlands) and in the Chapters 4, 5 and 6 (ie the studies on the validity of short questionnaires) these children were

underrepresented. We previously reported that CHPs have more difficulty in identifying psychosocial problems in immigrant children than in Dutch children.^{16,17} Additional research is needed on these groups.

Implications

Implications regarding PCH practice and policy

Our findings on the validation of several parent-reported questionnaires show that the use of short, valid and reliable questionnaires may improve the quality of problem detection by CHPs in preschool children, at least for children aged 2-4 years. Therefore, PCH should use these questionnaires in daily practice. Until now, the use of short parent-reported questionnaires for the detection of psychosocial problems by PCH at preschool age was limited. A major reason for this was that no validated Dutch questionnaires were available to support the detection of problems among pre-school children. Our validation studies support the general use of some short questionnaires in PCH in young children, but also the abolition of the use of some other ones. These changes may highly add to the quality of PCH and the health of young children and their parents. Given the large potential health gains, the use of these parent-reported questionnaires should be implemented widely to support the detection of psychosocial problems in PCH practices. This requires a well-designed implementation program consisting of the following steps. First, the results of our validation studies should be disseminated among PCH professionals. This should include the updating of the PCH guideline on the early detection of psychosocial problems²⁹ that was developed in 2008 with these findings, as has already been advised to the coordinator of the development programme for PCH guidelines, ZonMw, indeed. As part of this the validated parent-reported questionnaires could be disseminated too.

Second, this implementation may consist of training CHPs in the use of the questionnaires, to promote use as intended and prevent unintended use as has been shown in the past. Training should focus on how to calculate a total score, how to interpret the results, how to discuss findings with the parents and what to do when an elevated score has been found. Another way to support correct use of the questionnaires is to develop a PCH manual for each questionnaire. This has also been done for the SDQ among 7 to 12-year-olds.³⁰

Third, such an implementation programme should include a continuous quality monitoring plan to ensure that the professionals will continue to use the questionnaires as intended. This plan needs to describe activities that guarantee the quality regarding the identification of psychosocial problems, such as organizing recurrent inter-colleagues assays and

keeping relevant documents (eg protocols) up to date. Finally, such an implementation programme should include a plan to encourage all parents to complete the questionnaires. In the past couple of years, there has been an increasing resistance by parents to complete questionnaires that are used by PCH. According to some parents these questionnaires are often too much focused on their private live.³¹ PCH is seen by some parents as focusing mainly on risk selection, while monitoring the physical, social, psychological and cognitive development of children is less important. In order to overcome this criticism it is important that the PCH explains to the parents the purpose of their work. Furthermore, parents need to be convinced that the identification of problems by PCH is valid and that resulting interventions are effective in preventing or reducing the problem. Future research is needed to collect this evidence.

The last couple of years the Dutch youth care system is changing, this may affect the way in which PCH performs its tasks. First, a decentralization of the Dutch youth care system takes place; responsibility for all policies regarding children, young people and families are being delegated from provincial and national government to municipalities. The reason behind this decentralization is that the youth care system should become more coherent, efficient and cost-effective and focus on prevention and the capacities of children, young people and parents. This decentralization should lead to a closer connection between the universal services (eg youth work), preventive services (eg PCH, social work) and specialized services (eg mental health care, youth care). A closer connection between PCH and specialized services may help PCH to refer children and families more easily to specialized youth care services if needed. A joint use of the questionnaires that have been evaluated as part of this thesis may support the ease of referral.

Second, there is a severe pressure on available budgets regarding care for children, and more specifically the tasks performed by PCH. The aim of PCH is to monitor the physical, social, psychological and cognitive development of children and to identify problems in order to offer timely interventions. Due to reduced resources PCH may give up additional tasks like short term parenting support. If so, PCH should carefully monitor if other, perhaps more specialized youth care services are available to provide the necessary support for parents.

Third, the working method of PCH is changing. The traditional working method of PCH is evolving into triage-based working methods. The psychometric properties of the parent-reported questionnaires (Chapters 4, 5 and 6) were investigated within the traditional working method of PCH. PCH workers raise questions regarding the applicability of our findings to a triage-based working method. The major difference between the traditional

and triage based approach is the involvement of the CHP. In the traditional approach of PCH all children were examined by a CHP (nurse or physician), in the presence of parents. In triage-based working methods, short questionnaires are used as a first step in identification, without contact with or involvement of a professional. In our study design we investigated the psychometric properties of the questionnaires without taking into account the identification of psychosocial problems by the CHP. Our validation results may be generalized to a triage-based working method if parental completion of the questionnaires between triage-based and traditional approaches is similar. The influence of PCH working method on parental completion of the questionnaires deserves further study.

Children with psychosocial problems should not only be identified as early as possible, they should be helped too, of course. This implies the availability of effective early interventions, over and above those for early detection. What are the options for PCH when a psychosocial problem has been identified? PCH may help to reduce psychosocial problems by referring a child to a mental health service. However, it may also be effective to improve the child rearing skills of parents to reduce psychosocial problems in children. Several potentially effective parenting programs for pre-school children are: Incredible years,³²⁻³⁴ Triple P-positive Parenting program^{35,36} and Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD).³⁷ However, further research and development is needed regarding the early treatment of psychosocial problems in pre-school children. For example, more evidence needs to be collected about the long-term effectiveness of parenting programs. An overview regarding the effectiveness of each program can be found at the NJI database.

Implications for research

Based on our findings on inter-professional variation we concluded that CHPs identify psychosocial problem in children in a standardized way, but that a considerable part of this inter-professional persisted. Further research is needed to investigate whether other factors not included in our study, also account for differences between CHPs. Practice factors may have a major impact on communications between physicians and families.³⁸ For instance, practices that are rewarded on the basis of quality all improve their processes including identification.

This thesis reported on the validity and added value of several questionnaires for the identification of children aged 6 months to 4 years with psychosocial problem in PCH services. Based on our results we recommend using the BITSEA in children aged 2 years and the SDQ in children aged 3-4 years for the detection of psychosocial problems by PCH. Our

findings were based on cross-sectional measurements. As part of the traditional PCH system children undergo approximately 15 routine examinations at preschool-age (0-4 years), and three examinations during their school careers by a CHP (nurse or physician). Longitudinal research is needed to determine at which age these questionnaires could be best applied. For instance, it could be determined what the added value (ie, new cases) of the SDQ is at the age of 3 years when the BITSEA is already completed by parents at the age of 2 years.

Questionnaires for the detection of psychosocial problems may not always be used as they should be in routine PCH practice. For instance, cut-off points are not used as indicated in validation studies. Even minor changes can seriously impair the validity of a questionnaire.¹⁰ It needs to be evaluated under which conditions the questionnaires actually improve the identification of psychosocial problems in daily practice.

The use of a web-based system to collect information from parents may be more efficient to detect psychosocial problems than the currently used paper and pencil-reported questionnaires. With a web-based system scores can be automatically calculated, so the PCH professional does not need to do the scoring themselves. A disadvantage of a web-based system may be that some parents do not have the assets or the skills to use a computer. Furthermore, some parents are not willing to complete a questionnaire on the internet, because they have concerns to reveal private details on the web.³⁹ It needs to be evaluated how web-based systems may be used to improve the quality of detection of psychosocial problems by PCH.

Using information from multiple-sources (eg parent, teachers/day-care center, and child themselves) on psychosocial problems may help the identification of psychosocial problems.⁴⁰⁻⁴² Although a few PCH services use multiple-source data collection (eg, parent and teacher) as part of their care, the studies reported in this thesis collected only information from one source, the parent. The added value of multiple sources has not been sufficiently investigated in PCH practice. Also, the practicability of such an approach may be a serious issue. Further research is needed how multiple source data collection in PCH practice can be used to get a more complete picture regarding psychosocial problems in children.

For children aged 5-6 years no short, valid and reliable questionnaires are available to identify psychosocial problems. A previous study showed that the LSPPK can improve the identification, but the validity and added value was limited.⁵ In the 7-12 age group⁴ and for adolescents the SDQ performed better.⁴² The SDQ needs to be validated among the age group 5-6 years as well for this reason. If valid, the SDQ should be implemented, followed by an evaluation in its use.

Our research is targeted on the general population and not specifically on children at

increased risk for psychosocial problems, like immigrant children. Cultural differences related to expression of psychosocial problems and disclosure may affect the validity of short questionnaires in immigrant parents/children. Further research is needed to evaluate the use of questionnaires to detect psychosocial problems in immigrant children.^{16,17}

As described before, a well-designed implementation program is required to implement the use of short, valid and reliable parent-reported questionnaires to support the detection of psychosocial problems in PCH practices. The effect of such an implementation program needs to be evaluated.

Finally, our findings regarding discipline practices of parents may help to identify parents who are at risk for the use of aversive discipline practice. This identification and the subsequent treatment deserves a separate evaluation.

Conclusion

This thesis shows, first, that there is room for improvement regarding the quality of detection of psychosocial problems by CHPs in children aged 0-6 years. Short valid and reliably questionnaires such as the BITSEA and SDQ may provide effective support for PCH in the identification of psychosocial problems in children aged 2, respectively 3 and 4 years old. Second, information regarding parents at risk for aversive disciplining may help to identify these parents, which in the long run may prevent psychosocial problems. In short there is a large potential to improve the mental health and family setting of young children.

References

1. Brugman E, Reijneveld SA, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems by preventive child health care. *Arch Pediatr Adolesc Med.* 2001;155(4):462-469.
2. Reijneveld SA, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Identification and management of psychosocial problems among toddlers in Dutch preventive child health care. *Arch Pediatr Adolesc Med.* 2004;158(8):811-817.
3. Vogels AG, Jacobusse GW, Hoekstra F, Brugman E, Crone M, Reijneveld SA. Identification of children with psychosocial problems differed between preventive child health care professionals. *J Clin Epidemiol.* 2008;61(1878-5921; 11):1144-1151.
4. Vogels AG, Crone MR, Hoekstra F, Reijneveld SA. Comparing three short questionnaires to detect psychosocial dysfunction among primary school children: A randomized method. *BMC Public Health.* 2009;9(1):489.
5. Vogels T, Reijneveld SA, Brugman E, den Hollander-Gijsman M, Verhulst FC, Verloove-Vanhorick SP. Detecting psychosocial problems among 5-6-year-old children in preventive child health care: The validity of a short questionnaire used in an assessment procedure for detecting psychosocial problems among children. *Eur J Public Health.* 2003;13(4):353-360.
6. DelCarmen-Wiggins R, Carter AS. Introduction--assessment of infant and toddler mental health: Advances and challenges. *J Am Acad Child Adolesc Psychiatry.* 2001;40(1):8-10.
7. Zero To Three. *Diagnostic Classification of Mental Health and Development Disorders in Infancy and Early Childhood, (Rev.Ed.)*. Washington, DC: Zero To Three Press; 2005.
8. Klein Velderman M, Crone MR, Wiefferink CH, Reijneveld SA. Identification and management of psychosocial problems among toddlers by preventive child health care professionals. *Eur J Public Health.* 2010;20(3):332-338.
9. Theunissen MH, Vogels AG, Reijneveld SA. Early detection of psychosocial problems in children aged 5 to 6 years by preventive child healthcare: Has it improved? *J Pediatr.* 2012;160(3):500-504.
10. Goodman R, Iervolino AC, Collishaw S, Pickles A, Maughan B. Seemingly minor changes to a questionnaire can make a big difference to mean scores: A cautionary tale. *Soc Psychiatry Psychiatr Epidemiol.* 2007;42(4):322-327.
11. Madigan S, Bakermans-Kranenburg MJ, Van Ijzendoorn MH, Moran G, Pederson DR, Benoit D. Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attach Hum Dev.* 2006;8(2):89-111.

12. Shaw DS, Owens EB, Giovannelli J, Winslow EB. Infant and toddler pathways leading to early externalizing disorders. *J Am Acad Child Adolesc Psychiatry*. 2001;40(1):36-43.
13. Reijneveld SA, de Meer G., Wiefferink CH, Crone MR. Detection of child abuse by Dutch preventive child-healthcare doctors and nurses: Has it changed? *Child Abuse Negl*. 2008;32(9):831-837.
14. UNICEF A. *A League Table of Child Maltreatment Deaths in Rich Nations*. Florence: UNICEF Innocenti Research Centre; 2003.
15. Reijneveld SA, van der Wal MF, Brugman E, Sing RA, Verloove-Vanhorick SP. Infant crying and abuse. *Lancet*. 2004;364:1340-1342.
16. Crone MR, Bekkema N, Wiefferink CH, Reijneveld SA. Professional identification of psychosocial problems among children from ethnic minority groups: Room for improvement. *J Pediatr*. 2010;156(2):277-284.
17. Reijneveld SA, Harland P, Brugman E, Verhulst FC, Verloove-Vanhorick SP. Psychosocial problems among immigrant and non-immigrant children--ethnicity plays a role in their occurrence and identification. *Eur Child Adolesc Psychiatry*. 2005;14(3):145-152.
18. Crone MR, Vogels AG, Hoekstra F, Treffers PD, Reijneveld SA. A comparison of four scoring methods based on the parent-rated strengths and difficulties questionnaire as used in the Dutch preventive child health care system. *BMC Public Health*. 2008;8:106.
19. Reijneveld SA, Vogels AG, Hoekstra F, Crone MR. Use of the pediatric symptom checklist for the detection of psychosocial problems in preventive child healthcare. *BMC Public Health*. 2006;6:197.
20. Reijneveld SA, Vogels AG, Brugman E, van Ede J, Verhulst FC, Verloove-Vanhorick SP. Early detection of psychosocial problems in adolescents: How useful is the Dutch short indicative questionnaire (KIVPA)? *Eur J Public Health*. 2003;13(2):152-159.
21. Verhulst FC, van der Ende J. Factors associated with child mental health service use in the community. *J Am Acad Child Adolesc Psychiatry*. 1997;36(7):901-909.
22. Skovgaard AM, Houmann T, Landorph SL, Christiansen E. Assessment and classification of psychopathology in epidemiological research of children 0-3 years of age: A review of the literature. *Eur Child Adolesc Psychiatry*. 2004;13(6):337-346.
23. Achenbach T, Rescorla L. *Manual for the ASEBA Preschool Forms and Profiles*. Burlington: University of Vermont; 2000.
24. Ferdinand RF, Visser JH, Hoogerheide KN, et al. Improving estimation of the prognosis of childhood psychopathology; combination of DSM-III-R/DISC diagnoses and CBCL scores. *J Child Psychol Psychiatry*. 2004;45(3):599-608.

25. Koot HM, Van Den Oord EJ, Verhulst FC, Boomsma DI. Behavioral and emotional problems in young preschoolers: Cross-cultural testing of the validity of the child behavior Checklist/2-3. *J Abnorm Child Psychol*. 1997;25(3):183-196.
26. Achenbach TM. *Manual for the Child Behavior checklist/4-18 and 1991 Profile*. Burlington: Department of Psychiatry, University of Vermont; 1991.
27. Verhulst FC, van der Ende J, Koot HM. *Manual for the CBCL/4-18 (in Dutch)*. Rotterdam: Erasmus University/Dept of Child and Adolescent Psychiatry, Sophia Childrens' Hospital; 1996.
28. Morsbach SK, Prinz RJ. Understanding and improving the validity of self-report of parenting. *Clin Child Fam Psychol Rev*. 2006;9(1):1-21.
29. Postma S. *JGZ-Richtlijn Vroegsignalering Van Psychosociale Problemen*. Bilthoven: RIVM/Centrum Jeugdgezondheid; 2008.
30. GGD Nederland. *Handleiding Voor Het Gebruik Van De SDQ Binnen De Jeugdgezondheidszorg*. Utrecht: GGD Nederland; 2006.
31. Ouders Online. *Code Oranje (Wees Alert)*. Amsterdam: Ouders Online; 2011.
32. Gross D, Fogg L, Webster-Stratton C, Garvey C, Julion W, Grady J. Parent training of toddlers in day care in low-income urban communities. *J Consult Clin Psychol*. 2003;71(2):261-278.
33. Gross D, Fogg L, Tucker S. The efficacy of parent training for promoting positive parent-toddler relationships. *Res Nurs Health*. 1995;18(6):489-499.
34. Hutchings J, Gardner F, Bywater T, et al. Parenting intervention in sure start services for children at risk of developing conduct disorder: Pragmatic randomised controlled trial. *BMJ*. 2007;334:678.
35. Sanders MR. Triple P-positive parenting program as a public health approach to strengthening parenting. *J Fam Psychol*. 2008;22(4):506-517.
36. Sanders MR, Turner KM, Markie-Dadds C. The development and dissemination of the triple P-positive parenting program: A multilevel, evidence-based system of parenting and family support. *Prev Sci*. 2002;3(3):173-189.
37. Fukkink RG. Video feedback in widescreen: A meta-analysis of family programs. *Clin Psychol Rev*. 2008;28(6):904-916.
38. Wissow L, Anthony B, Brown J, et al. A common factors approach to improving the mental health capacity of pediatric primary care. *Adm Policy Ment Health*. 2008;35(4):305-318.
39. Vogels AGC, Hilgersom MJC, Theunissen MHC, de Wolff MS, Reijneveld SA, eds. *Pilot Implementatie En Validatie Van De PSYCAT in De Jeugdgezondheidszorg*. Leiden: TNO Kwaliteit van leven; 2010.

40. Verhulst FC, Dekker MC, van der Ende J. Parent, teacher and self-reports as predictors of signs of disturbance in adolescents: Whose information carries the most weight? *Acta Psychiatr Scand.* 1997;96(1):75-81.
41. Goodman R, Ford T, Corbin T, Meltzer H. Using the strengths and difficulties questionnaire (SDQ) multi-informant algorithm to screen looked-after children for psychiatric disorders. *Eur Child Adolesc Psychiatry.* 2004;13 Suppl 2:II25-31.
42. Wolff de MS, Vogels AGC, Theunissen MHC, Siebelink BM, Reijneveld SA. The strength and difficulties questionnaire (SDQ) for 13 and 14 year-old adolescents in comparison to the KIVPA. *submitted.*

Strengths and difficulties questionnaire



Strengths and Difficulties Questionnaire

P 3/4

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of your child's behavior over the last six months.

Your child's name

Male/Female

Date of birth.....

		Not True	Somewhat True	Certainly True
1	Considerate of other people's feelings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Restless, overactive, cannot stay still for long	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Often complains of headaches, stomach-aches or sickness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Shares readily with other children, for example toys, treats, pencils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Often loses temper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Rather solitary, prefers to play alone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Generally well behaved, usually does what adults request	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Many worries or often seems worried	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Helpful if someone is hurt, upset or feeling ill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Constantly fidgeting or squirming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Has at least one good friend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Often fights with other children or bullies them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Often unhappy, depressed or tearful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Generally liked by other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Easily distracted, concentration wanders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Nervous or clingy in new situations, easily loses confidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Kind to younger children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Often argumentative with adults	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Picked on or bullied by other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Often offers to help others (parents, teachers, other children)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	Can stop and think things out before acting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Can be spiteful to others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Gets along better with adults than with other children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Many fears, easily scared	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	Good attention span, sees tasks through to the end	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you have any other comments or concerns?

Please turn over - there are a few more questions on the other side

26 Overall, do you think that your child has difficulties in one or more of the following areas: emotions, concentration, behavior or being able to get on with other people?

No	Yes- minor difficulties	Yes- definite difficulties	Yes- severe difficulties
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you have answered "Yes", please answer the following questions about these difficulties:

27 • How long have these difficulties been present?

Less than a month	1-5 months	6-12 months	Over a year
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

28 • Do the difficulties upset or distress your child?

Not at all	Only a little	Quite a lot	A great deal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

29 • Do the difficulties interfere with your child's everyday life in the following areas?

	Not at all	Only a little	Quite a lot	A great deal
HOME LIFE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FRIENDSHIPS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LEARNING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LEISURE ACTIVITIES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

30 • Do the difficulties put a burden on you or the family as a whole?

Not at all	Only a little	Quite a lot	A great deal
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Signature

Date

Mother/Father/Other (please specify:)

Thank you very much for your help

Summary



Summary

This thesis focuses on the early detection of psychosocial problems in children aged 6 months to 6 years by Preventive Child Healthcare (PCH). It investigates the quality of detection and on the degree to which short questionnaires can improve this detection by PCH. An additional aim was to investigate the predictors (child, parent and family factors) of various discipline practices in parents. This information may support PCH to identify groups at risk for the use of aversive disciplining practices.

The following research questions were answered:

1. What is the quality of identification of psychosocial problem by preventive child healthcare professionals (CHPs) in children aged 5 to 6 years? Has the quality improved after a series of nationwide interventions?
2. Does the proportion of children identified as having psychosocial problems vary between individual CHPs? If yes, could this variation be explained by CHP characteristics, such as work experience? Are CHP characteristics related to the quality of problem identification by CHPs?
3. What are the psychometric properties of a number of short questionnaires (Strengths and Difficulties Questionnaire, SDQ; short instrument for the psychological and pedagogical inventory, KIPPPI; Ages and Stages Questionnaires: Social-Emotional, ASQ:SE; Brief Infant Toddler Social Emotional Assessment; BITSEA) that PCH can use in the identification of psychosocial problems in preschool children and could these questionnaires improve the identification by CHPs? A major focus is at the SDQ, because many PCH services use this questionnaire for school-age children.
4. What are the prevalence rates and predictors (child, parent and family factors) of different discipline practices in parents of children aged 5 to 6 years?

Introduction

Chapter 1 describes what psychosocial problems are and addresses the prevalence, groups at risk and associated burden for children and parents. PCH is in a position to play an important role in the early identification of psychosocial problems in children, as they see nearly all children regularly. However, the identification of psychosocial problems by PCH may leave room for improvement. For instance, CHPs failed to identify psychosocial problems in about half the children. Validated questionnaires may improve the identification of psychosocial problems by CHPs in school-age children. However, for preschool-age no validated Dutch questionnaires were available to support the detection of

psychosocial problems in children aged 0-4 years by PCH. Finally, parenting contributes to the aetiology and prevention of psychosocial problems. Disciplining is an important aspect of parenting, however information is lacking on the prevalence of various practices, and on parents at risk for use of aversive discipline practices.

Ad 1. Quality of detection of psychosocial problems by CHPs

In Chapter 2 we assessed the quality of identification of psychosocial problems by CHPs in children aged 5 to 6 years and investigated whether the CHP identification has improved after a series of nationwide interventions, such as the development and validation of several short questionnaires for the detection of psychosocial problems and training CHPs throughout the country to improve their diagnostic skills. We analyzed data about 8550 children aged 5 to 6 years, who were assessed during routine well-child visits by CHPs. We found that identification of psychosocial problems was much more likely in children with an elevated CBCL score, a well validated questionnaire about behavioral and emotional problems (odds ratio:4.65, 95% confidence interval:3.28-6.58). Yet, CHPs failed to identify psychosocial problems in 42-47% of the children aged 5 to 6 years for which parents reported problems on the CBCL. Furthermore, 18-26% of the children with no problems on the CBCL were identified as having psychosocial problems by the CHP. Contrary to our expectation, the quality of psychosocial problem identification by CHPs did not improve after several nationwide interventions, the odd ratio for improvement was 0.81 (95% confidence interval: 0.57-1.15). We concluded that additional efforts are needed to improve early identification of psychosocial problems by CHPs.

Ad 2. Variation among CHPs

In Chapter 3 we assessed whether variation among individual CHPs in the proportion of children identified as having psychosocial problems can be explained by CHP characteristics (such as work experience), over and above variation in the mix of children. Furthermore, it was assessed whether CHP characteristics were related to the quality of psychosocial problem identification. We used data about 3070 children aged 5 to 6 years, who were assessed during routine well-child visits by CHPs (response rate 85.2%). We found that CHPs varied widely in the proportion of children identified as having psychosocial problems. CHP characteristics such as work experience and work style (for example, on indication use of behavior questionnaires like the CBCL in routine care) explained about a quarter of this inter-CHP variation; child characteristics did not. On indication use of the CBCL and of the Teacher Report Form in routine care was associated with better and worse agreement between CHP identification of psychosocial problems and parent-report on

the CBCL, respectively. Work experience was not related to a better psychosocial problem identification, though it explained some of the variation. We concluded that CHPs varied widely in the proportion of children identified as having problems. This variation may be reduced and quality of identification may be improved by changing the work style of CHPs and targeted training.

Ad 3. Psychometric properties of a number of short questionnaires

In Chapters 4, 5 and 6 we evaluated a number of short questionnaires and determined whether these questionnaires could improve the identification of psychosocial problems by CHPs.

In Chapter 4 we compared the psychometric properties (internal consistency and validity) of three parent-reported questionnaires (KIPPPPI, ASQ:SE, BITSEA) for the identification of psychosocial problems in children aged 6, 14 or 24 months by PCH. CBCL score was used as criterion. We also assessed the degree to which each questionnaire could improve identification of PCH compared to clinical assessment alone. We included 2,106 children aged 6, 14 or 24 months (response 82%) undergoing routine well-child visits by CHPs. We found that the internal consistencies of the total scales of the KIPPPPI and BITSEA were satisfactory, (Cronbach's alphas varied between 0.79 and 0.91), but was low for the ASQ:SE (Cronbach's alpha varied between 0.46-0.62). At the age of 6 months (KIPPPPI, ASQ:SE) and 14 months (KIPPPPI, ASQ:SE, BITSEA) none of the questionnaires studied were a good indicator of problems. At the age of 2 years, only the BITSEA discriminated appropriately between children with and without problems, but not the other two questionnaires. In addition, the BITSEA at this age offered most added value in the identification of psychosocial problems by CHPs compared to identification based on clinical assessment alone. Separate analyses on the BITSEA showed that sensitivity at a cut-off point with specificity of 0.91 was 0.84 as measured by the CBCL. We concluded that at the ages 6 and 14 months, no questionnaire is sufficiently valid to support the identification of psychosocial problems. The BITSEA is the only valid tool for the early detection of psychosocial problems in 2 years old children. This tool may improve the early detection by PCH services.

In Chapter 5 we compared the psychometric properties (internal consistency, scale structure and validity) and the added value of three parent-reported questionnaires (SDQ, KIPPPPI, ASQ:SE) for the identification of psychosocial problems among 3 to 4 years old children by PCH. CBCL and treatment status were used as criteria. We included 1650 children (response 64%) aged 3 to 4 years undergoing routine well-child visits by CHPs. We found that the internal consistency of the total scale of each questionnaire was satisfactory. Cronbach's alphas varied between 0.75 and 0.98. Only the SDQ discriminated sufficiently

between children with and without problems as measured by the CBCL (sensitivity = 0.76 at a cut-off point with specificity = 0.90), in contrast to the KIPPPPI and ASQ:SE (with sensitivity varying between 0.51-0.63). We found similar results for the criterion treatment status, although sensitivity indices were lower for all questionnaires. The SDQ added most to the identification of psychosocial problems by CHPs compared with the KIPPPPI and the ASQ:SE, although the differences between the SDQ and the ASQ:SE were not statistically significant. We concluded that only the SDQ is a valid tool for the identification of psychosocial problems in 3 to 4 years old children by PCH services.

In Chapter 6 the psychometric properties of the SDQ among preschool-age children (3 to 4 years) were studied. We assessed the internal consistency, the scale structure and validity (correlation coefficients, sensitivity and specificity) with CBCL score and treatment status as criteria, and the degree to which the SDQ could improve identification by CHPs based solely on clinical assessment. We included 839 children aged 3 to 4 years undergoing routine health assessments in PCH services (response 66%). Our findings showed that the internal consistency of the SDQ total difficulties score was good (Cronbach's alpha = 0.78), but it was worse for some subscales of the SDQ (range 0.50-0.74.). Sensitivity at a cut-off point with specificity of 0.93 was 0.79 as measured by the CBCL. The SDQ added information to the clinical assessment; the odds ratio for added information using the CBCL as a criterion was 36.48. We concluded that the SDQ is a valid tool for the identification of psychosocial problems in preschool-age children by PCH. Our findings in Chapter 6 regarding the psychometric properties and added value of the SDQ are slightly different compared to our findings in Chapter 5. These differences can be explained by the datasets that we used. In Chapter 6 our analyses combined the data from children 3 and 4 years old, while in Chapter 5 we analysed the data separately for these two age groups.

Ad 4. Prevalence and predictors of different discipline practices.

In Chapter 7 we assessed the prevalence and predictors (child, parent and family factors) of different discipline practices in parents of children aged 5-6 years. Associations were examined between discipline practices and child (eg child age and gender, ethnicity), parent (eg parental educational level and employment status) and family factors (eg urbanization and family income). We included 1630 children aged 5-6 years undergoing routine well-child assessments by CHPs (response rate 84%). Our findings showed that parental punishment prevalence as a discipline strategy was 21.9% for spanking and 80.3% for other punishments practices, such as time-outs. The prevalence of rewards as a discipline strategy was 32.2% for granting privileges and 86.3% for cuddling/complimenting. Spanking was more likely in families where the mothers have low and

medium levels of education and in families of non-Dutch ethnicity. Other punishment practices (eg time-outs, verbal reprimands and holding) were more likely in families of Dutch ethnicity. Granting privileges to discipline was more likely in families of non-Dutch ethnicity, who lived in large cities, whose income was below poverty level, in unemployed families and in small families. Cuddling and complimenting were more likely in families with a high maternal educational level, in families of Dutch ethnicity and in small families (< 3 children). We concluded that it is important to consider social and economic factors when identifying and supporting parents with parenting/rearing challenges.

Discussion and implications

In Chapter 8 the answers on the main research questions of this thesis were summarized. The findings of the reported studies were integrated and results were discussed. Methodological considerations and recommendations for PCH practice and research were made.

The results as presented in this thesis showed that there is room for improvement regarding the quality of early detection of psychosocial problems by CHPs. Psychosocial problem identification by CHPs has not improved after a series of nationwide interventions; CHPs still miss many children with psychosocial problems. Our findings on inter-professional variation indicate that some initiatives may improve this identification, for instance systematic working (eg, the on-indication use of high quality questionnaires like the CBCL). Our findings regarding the validity of several short parent-reported questionnaires showed that at the ages of 6 and 14 months none of the instruments (KIPPPI, ASQ:SE and BITSEA) that we studied improved identification in an important way. The BITSEA and SDQ may improve the quality of psychosocial problem detection by CHPs in children aged 2, respectively 3 and 4 years old. Regarding parental discipline practices we found that aversive discipline practices were more frequently used in families characterized by a relatively deprived societal position, such as having a low income, low educational level, immigrant status and unemployment. These findings may help to identify parents who are at risk for the use of aversive discipline practices.

The methodological approach of the studies in this thesis allow a valid generalization of our findings towards the large majority of children under PCH care. However, further research is needed among children from ethnic minorities.

Regarding implications we entered the following points:

- 1) The findings of our validation studies support the use of the BITSEA (2 years) and SDQ (3 to 4 years) in PCH in preschool children. Given the large potential health gains, the use of these questionnaires should be implemented widely. This requires a well-designed implementation program.
- 2) We investigated the psychometric properties of the parent-reported questionnaires within the traditional working method of PCH. More research is needed to investigate whether our results are also applicable in a triage-based working method.
- 3) More research is needed to determine at which age of the child the short parent-reported questionnaires to detect psychosocial problems could best be applied. For instance, it should be determined what the added value (ie, new cases) is to complete the SDQ at the age of 3 years when the BITSEA is already completed by parents at the age of 2 years.
- 4) It needs to be investigated how web-based systems to collect information from parents and how multiple source data collection (eg, parents and day-care) may be used to improve the detection of psychosocial problems in PCH practice.
- 5) Finally, for children aged 5-6 years no short, valid and reliable questionnaires are available to identify psychosocial problems. More research is desirable.

In short there is a large potential to improve the mental health and family setting of young children

Samenvatting



Samenvatting

Dit proefschrift richt zich op de vroegtijdige signalering van psychosociale problemen bij kinderen in de leeftijd van 6 maanden tot en met 6 jaar door de Jeugdgezondheidszorg (JGZ). Het gaat met name in op de kwaliteit van de signalering van psychosociale problemen door de JGZ en de mate waarin korte vragenlijsten die signalering kunnen verbeteren. Tevens wordt onderzocht welke kind-, ouder- en gezinsfactoren het gebruik van verschillende disciplinestijlen van ouders voorspellen. Deze informatie kan de JGZ helpen bij het identificeren van groepen ouders die risico lopen om aversieve disciplinestijlen te gebruiken.

De onderzoeksvragen zijn:

1. Wat is de kwaliteit van de signalering van psychosociale problemen bij kinderen in de leeftijd van 5 en 6 jaar door JGZ-medewerkers? Is de kwaliteit van de signalering verbeterd na een aantal landelijke interventies?
2. Zijn er verschillen tussen individuele JGZ-medewerkers in het percentage kinderen dat zij signaleren met psychosociale problemen? Indien ja, kunnen deze verschillen verklaard worden door kenmerken van de JGZ-medewerker, zoals werkervaring? Hangen de kenmerken van de JGZ-medewerker samen met de kwaliteit van de signalering van psychosociale problemen?
3. Wat zijn de psychometrische kenmerken van een aantal korte vragenlijsten (Strengths and Difficulties Questionnaire, SDQ; Kort Instrument voor de Psychologische en Pedagogische Probleem Inventarisatie, KIPPI; Ages and Stages Questionnaires: Social-Emotional, ASQ:SE; Brief Infant Toddler Social Emotional Assessment; BITSEA) die de JGZ zou kunnen gebruiken bij de signalering van psychosociale problemen bij 0-4 jarigen en kunnen deze vragenlijsten de signalering door de JGZ-medewerkers verbeteren? Er is veel aandacht besteed aan de SDQ, omdat een groot aantal JGZ instellingen deze vragenlijst gebruikt voor basisschoolkinderen.
4. Wat zijn de prevalenties en voorspellers (kind-, ouder- en gezinsfactoren) van verschillende disciplinestijlen die ouders kunnen gebruiken bij kinderen in de leeftijd van 5 en 6 jaar?

Inleiding

In hoofdstuk 1 beschrijven we wat psychosociale problemen zijn en komen de prevalentie, risicogroepen en de gevolgen van psychosociale problemen voor ouder en kind aan bod. De JGZ is één van de belangrijkste voorzieningen voor de vroegtijdige opsporing

van psychosociale problemen bij kinderen, omdat zij bijna alle kinderen op regelmatige basis ziet. De signalering van psychosociale problemen door de JGZ is echter niet optimaal. Bijvoorbeeld, JGZ-medewerkers herkennen slechts de helft van de kinderen met psychosociale problemen. Gevalideerde vragenlijsten kunnen de opsporing van psychosociale problemen door de JGZ bij basisschoolkinderen verbeteren. Er zijn echter geen gevalideerde Nederlandstalige vragenlijsten beschikbaar die de opsporing van psychosociale problemen door de JGZ bij 0-4 jarigen kan ondersteunen.

Tenslotte, de opvoeding draagt bij aan het ontstaan en het voorkomen van psychosociale problemen. Disciplineren is een belangrijk onderdeel van de opvoeding. Er ontbreekt echter informatie over de prevalentie van verschillende disciplinestijlen en over groepen ouders die risico lopen om aversieve disciplinestijlen te gebruiken.

Ad 1. De kwaliteit van de signalering van psychosociale problemen door JGZ-medewerkers

In hoofdstuk 2 hebben we de kwaliteit van de signalering van psychosociale problemen bij kinderen in de leeftijd van 5 en 6 jaar door JGZ-medewerkers onderzocht. We hebben ook onderzocht of de signalering door JGZ-medewerkers verbeterd is na een aantal landelijke interventies, zoals de ontwikkeling en validatie van korte vragenlijsten voor de opsporing van psychosociale problemen en het trainen van JGZ-medewerkers –verspreid over het hele land– om de diagnostische vaardigheden te verbeteren. We hebben gegevens geanalyseerd van 8550 kinderen in de leeftijd van 5 en 6 jaar. Deze gegevens werden verzameld tijdens de reguliere preventieve gezondheidsonderzoeken uitgevoerd door JGZ-medewerkers. De resultaten lieten zien dat psychosociale problemen inderdaad vaker gesignaleerd werden bij kinderen met een verhoogde score op de Child Behavior Checklist (CBCL), een veel gebruikt en ruim gevalideerd meetinstrument (odds ratio:4.65, 95% betrouwbaarheidsinterval:3.28-6.58). Desondanks signaleerde JGZ-medewerkers geen problemen bij 42-47% van de kinderen in de leeftijd van 5 en 6 jaar met een verhoogde CBCL-score. En omgekeerd, de JGZ signaleerde wel problemen bij 18-26% van de kinderen met een niet afwijkende CBCL-score. In tegenstelling tot onze verwachting is de signalering van psychosociale problemen door de JGZ-medewerkers niet verbeterd na een aantal landelijke interventies, de odds ratio voor verbetering was 0.81 (95% betrouwbaarheidsinterval: 0.57-1.15). We concludeerden dat er extra inzet nodig is om de vroegsignalering van psychosociale problemen door de JGZ te verbeteren.

Ad 2. Verschillen tussen JGZ-medewerkers

In hoofdstuk 3 werd onderzocht of de verschillen tussen individuele JGZ-medewerkers in het percentage kinderen met psychosociale problemen dat zij signaleren verklaard kunnen worden door kenmerken van de JGZ-medewerkers (zoals werkervaring), waarbij er gecorrigeerd is in de variatie in de samenstelling van de groep kinderen. Er is ook onderzocht of de kenmerken van de JGZ-medewerkers samenhangen met de kwaliteit van de signalering van psychosociale problemen. We hebben gegevens geanalyseerd van 3070 kinderen in de leeftijd van 5 en 6 jaar (respons 85,2%). Deze gegevens werden verzameld tijdens de reguliere preventieve gezondheidsonderzoeken uitgevoerd door JGZ-medewerkers. De resultaten lieten zien dat er grote verschillen zijn tussen JGZ-medewerkers in het percentage kinderen dat zij signaleren met psychosociale problemen. Kenmerken van JGZ-medewerkers, zoals werkervaring en werkstijl (bijvoorbeeld, het gebruik van vragenlijsten op indicatie, zoals de CBCL) verklaren ongeveer een kwart van de verschillen tussen JGZ-medewerkers. Deze verschillen tussen JGZ-medewerkers hingen niet samen met kenmerken van kinderen. Het op indicatie gebruiken van de CBCL of de Teacher Report Form in de JGZ hangt samen met, respectievelijk, een betere en slechtere overeenkomst tussen JGZ signalering van psychosociale problemen en de CBCL. Werkervaring was niet gerelateerd aan een betere signalering van psychosociale problemen, ondanks dat het wel een gedeelte van de verschillen tussen de JGZ-medewerkers verklaarde. We concludeerden dat er grote verschillen zijn tussen JGZ-medewerkers in het percentage kinderen dat zij signaleren met psychosociale problemen. Deze verschillen kunnen verkleind worden en de kwaliteit van de signalering kan verbeterd worden door de werkstijl van JGZ-medewerkers te veranderen en door gerichte training te geven aan JGZ-medewerkers.

Ad 3. Psychometrische eigenschappen van enkele korte vragenlijsten

In de hoofdstukken 4, 5 en 6 werden enkele korte vragenlijsten geëvalueerd en is bepaald in hoeverre gebruik van deze vragenlijsten de opsporing van psychosociale problemen door de JGZ kan verbeteren.

In hoofdstuk 4 werden de psychometrische eigenschappen (interne consistentie en validiteit) vergeleken van drie oudervragenlijsten (KIPPP, ASQ:SE en BITSEA) voor de opsporing van psychosociale problemen bij kinderen in de leeftijd van 6, 14 en 24 maanden. De CBCL-score werd gebruikt als criterium. Ook werd nagegaan of deze vragenlijsten toegevoegde waarde bieden voor de JGZ, ofwel of het gebruik van de vragenlijst door de JGZ er toe leidt dat een beter onderscheid gemaakt wordt tussen kinderen met en zonder problemen, dan wanneer dat onderscheid alleen op basis van een klinisch oordeel gemaakt wordt. De onderzoeksgroep bestond uit 2106 kinderen in de leeftijd van 6 tot

en met 24 maanden (respons 82%) die uitgenodigd waren voor het reguliere preventieve gezondheidsonderzoek van de JGZ. De interne consistentie van de totaalschaal van de KIPPPI en de BITSEA was voldoende (Cronbach's α varieerde, afhankelijk van leeftijd versie, tussen 0,79 en 0,91), maar deze was laag voor de ASQ:SE (Cronbach's α varieerde tussen 0,46 en 0,62). Op de leeftijd van 6 maanden (KIPPPI en ASQ:SE) en 14 maanden (KIPPPI, ASQ:SE, BITSEA) is geen enkele vragenlijst een goede indicator van problemen. Op de leeftijd van 2 jaar kan alleen de BITSEA een goed onderscheid maken tussen kinderen met en zonder problemen, en de overige twee vragenlijsten niet. De BITSEA bleek ook de meeste toegevoegde waarde te kunnen bieden aan de JGZ. Dat betekent dus dat het gebruik van de BITSEA door de JGZ er toe leidt dat een beter onderscheid wordt gemaakt tussen kinderen met en zonder problemen. Analyses op de BITSEA lieten zien dat de sensitiviteit 0,79 was bij een afkappunt met een specificiteit van 0,91, met de CBCL als criterium. Geconcludeerd werd dat bij kinderen in de leeftijd van 6 en 14 maanden geen enkele vragenlijst voldoende valide is om te gebruiken voor de opsporing van psychosociale problemen. De BITSEA is een valide instrument voor de vroegsignalering van psychosociale problemen bij kinderen in de leeftijd van 2 jaar. Het gebruik van dit instrument door de JGZ kan de signalering verbeteren.

In hoofdstuk 5 werden de psychometrische eigenschappen (interne consistentie, schaal structuur en validiteit) en de toegevoegde waarde voor de JGZ van drie oudervragenlijsten met elkaar vergeleken (SDQ, KIPPPI en ASQ:SE) voor de opsporing van psychosociale problemen bij kinderen in de leeftijd van 3 en 4 jaar. CBCL-score en behandelstatus werden gebruikt als criteria. We hebben gegevens geanalyseerd van 1650 kinderen (response 64%) in de leeftijd van 3 en 4 jaar. Deze gegevens werden verzameld tijdens de reguliere preventieve gezondheidsonderzoeken uitgevoerd door JGZ-medewerkers. De interne consistentie van de totaal schaal van de SDQ, KIPPPI en ASQ:SE was voldoende. De Cronbach's α varieerde tussen 0,75 en 0,98. De SDQ kan een goed onderscheid maken tussen kinderen met en zonder problemen, zoals gemeten met de CBCL (sensitiviteit was 0,76 bij een afkappunt met een specificiteit van 0,90). Dat geldt echter niet voor de KIPPPI en de ASQ:SE, waarbij de sensitiviteit varieerde tussen 0,51 en 0,61. We vonden vergelijkbare resultaten voor het criterium behandelstatus, maar de sensitiviteit was voor alle vragenlijsten laag. De SDQ bleek de meeste toegevoegde waarde te kunnen bieden aan de JGZ in de opsporing van psychosociale problemen, meer dan de KIPPPI en de ASQ:SE. De verschillen tussen de SDQ en de ASQ:SE met betrekking tot toegevoegde waarde voor de JGZ waren echter niet significant. We concludeerden dat alleen de SDQ een valide instrument is voor de vroegsignalering van psychosociale problemen door de JGZ bij kinderen in de leeftijd van 3 en 4 jaar.

In hoofdstuk 6 werden de psychometrische eigenschappen van de SDQ onderzocht bij kinderen in de leeftijd van 3 en 4 jaar. De interne consistentie, de schaalstructuur en de validiteit (correlatie coëfficiënten, sensitiviteit en specificiteit) zijn onderzocht. CBCL en behandelstatus werden als criteria gebruikt. Ook de mate waarin de SDQ de opsporing van psychosociale problemen door de JGZ kan verbeteren in vergelijking met alleen een klinisch oordeel werd onderzocht. We hebben de gegevens geanalyseerd van 839 kinderen (respons 66%) in de leeftijd van 3 en 4 jaar, verzameld tijdens de reguliere preventieve gezondheidsonderzoeken uitgevoerd door JGZ-medewerkers. De interne consistentie van de SDQ totale probleem schaal was goed (Cronbach's $\alpha = 0,78$), maar was minder goed voor sommige subschalen van de SDQ (range 0,50-0,74). De sensitiviteit was 0,91 bij een afkappunt met een specificiteit van 0,93 bij gebruik van het CBCL criterium. De SDQ had toegevoegde waarde voor het klinisch oordeel; de odds ratio voor verbetering was 36,48 bij het CBCL criterium. We concludeerden dat de SDQ een valide instrument is voor de opsporing van psychosociale problemen door de JGZ bij kinderen in de leeftijd van 3 en 4 jaar. Onze bevindingen in hoofdstuk 6 met betrekking tot de psychometrische eigenschappen en de toegevoegde waarde van de SDQ wijken iets af van de bevindingen zoals gepresenteerd in hoofdstuk 5. Deze verschillen kunnen verklaard worden door de databestanden die we hebben gebruik. In hoofdstuk 6 zijn de gegevens van kinderen in de leeftijd van 3 en 4 jaar gecombineerd, terwijl in hoofdstuk 5 de analyses zijn uitgevoerd voor elk van deze twee leeftijdsgroepen apart.

Ad 4. Prevalentie en voorspellers van verschillende disciplinestijlen

In hoofdstuk 7 zijn de prevalentie en voorspellers (kind-, ouder-, en gezinsfactoren) van verschillende disciplinestijlen onderzocht die ouders kunnen gebruiken bij kinderen in de leeftijd van 5 en 6 jaar. De samenhang tussen enerzijds disciplinestijlen en anderzijds kind (bijv. leeftijd, geslacht en etniciteit), ouder (opleiding en werkstatus) en gezinsfactoren (bijv. verstedelijking en inkomen) zijn onderzocht. De onderzoeksgroep bestond uit 1630 kinderen in de leeftijd van 5 en 6 jaar (respons 84%) die uitgenodigd waren voor het reguliere preventieve gezondheidsonderzoek van de JGZ. Onze resultaten lieten zien dat de prevalentie van straffen 21,9% was voor een tik geven en 80,3% voor andere straffen, zoals een time-out. De prevalentie van belonen als een discipline strategie was 32,2% voor het toekennen van privileges en 86,3% voor knuffelen/complimentjes geven. Een tik geven kwam vaker voor in gezinnen waar de moeder een lage of gemiddelde opleiding heeft, en in gezinnen met een niet-Nederlandse etniciteit. Andere straffen (bijv. time-out, een standje geven en beetpakken) kwamen vaker voor in gezinnen met een Nederlandse etniciteit. Het toekennen van privileges als een manier om te disciplineren kwam vaker voor in gezinnen

met een niet-Nederlandse etniciteit, gezinnen die wonen in grote steden, gezinnen met een inkomen onder de armoede grens en in kleine gezinnen (< 3 kinderen). We concludeerden dat het belangrijk is om sociale en economische factoren in ogenschouw te nemen bij het identificeren en ondersteunen van ouders met opvoedproblemen.

Discussie en implicaties

In hoofdstuk 8 worden de antwoorden op de onderzoeksvragen van dit proefschrift samengevat. De bevinden van de gerapporteerde onderzoeken worden geïntegreerd en de resultaten bediscussieerd, methodologische beperkingen worden besproken en aanbevelingen worden geformuleerd zowel voor de JGZ praktijk als voor wetenschappelijk onderzoek.

De resultaten zoals gepresenteerd in dit proefschrift lieten zien dat de kwaliteit van de vroegsignalering van psychosociale problemen door de JGZ niet optimaal is. De vroegsignalering van psychosociale problemen door JGZ-medewerkers bleek na een aantal landelijke interventies niet verbeterd; JGZ-medewerkers herkennen nog steeds veel kinderen met psychosociale problemen niet. Ons onderzoek gericht op individuele verschillen tussen JGZ-medewerkers geeft enkele handvatten om deze signalering te verbeteren, zoals systematisch werken door JGZ-medewerkers (bijv. het op indicatie gebruik van kwalitatieve vragenlijsten zoals de CBCL). Onze bevindingen met betrekking tot validiteit van enkele korte oudervragenlijsten lieten zien dat op de leeftijd van 6 en 14 maanden geen enkele van de onderzochte vragenlijsten (KIPPPI, ASQ:SE en BITSEA) de vroegsignalering kan verbeteren. De BITSEA en de SDQ kunnen de kwaliteit van de signalering van psychosociale problemen door de JGZ verbeteren bij respectievelijk kinderen in de leeftijd van 2 jaar (BITSEA) en 3-4 jaar (SDQ).

Met betrekking tot disciplinestijlen van ouders, lieten de bevindingen zien dat aversieve disciplinestijlen vaker werden gebruikt in gezinnen gekarakteriseerd door een relatief achtergestelde sociale positie, zoals laag inkomen, laag opleidingsniveau, immigranten status en werkeloosheid. Deze bevindingen kunnen helpen om ouders te identificeren die risico lopen om aversieve disciplinestijlen te gebruiken.

De methodologie van de gerapporteerde onderzoeken in dit proefschrift staat het toe om de bevindingen te generaliseren naar het merendeel van de kinderen die zorg ontvangen van de JGZ. Wel is er meer onderzoek nodig bij kinderen van etnische minderheden.

Met betrekking tot implicaties noemen we de volgende punten:

- 1) De bevindingen van onze validatieonderzoeken ondersteunen het gebruik van de BITSEA en de SDQ in de JGZ bij kinderen in de leeftijd van 2 tot en met 4 jaar. Vanwege de grote gezondheidswinsten zouden deze vragenlijsten breed geïmplementeerd moeten worden. Hiervoor is een goed ontwikkeld implementatieplan nodig.

- 2) We hebben de psychometrische eigenschappen van de oudervragenlijsten onderzocht in de traditionele werkwijze van de JGZ. Meer onderzoek is nodig om te bepalen of onze resultaten ook toepasbaar zijn in een triage werkwijze.
- 3) Meer onderzoek is nodig om te bepalen op welke leeftijd van het kind de oudervragenlijsten voor de opsporing van psychosociale problemen het beste afgenomen kunnen worden. Zo is het bijvoorbeeld nodig dat er nagegaan wordt wat de toegevoegde waarde is van het invullen van de SDQ op driejarige leeftijd, wanneer de BITSEA al is ingevuld door de ouders op tweejarige leeftijd.
- 4) Er moet onderzocht worden op welke wijze het internet gebruikt kan worden om informatie van ouders te verzamelen over psychosociale problemen. Tevens moet nagegaan worden op welke wijze het verzamelen van informatie bij meerdere bronnen (bijv. ouders en kinderdagopvang) kan bijdragen aan de verbetering van de vroegsignalering van psychosociale problemen door de JGZ.
- 5) Tenslotte, voor kinderen in de leeftijd van 5 en 6 jaar ontbreekt momenteel nog informatie over welke korte valide en betrouwbare vragenlijsten er beschikbaar zijn voor de opsporing van psychosociale problemen. Voor een evidence based JGZ is die informatie broodnodig.

Kortom, er is veel ruimte om de mentale gezondheid en gezinssituatie van gezinnen met jonge kinderen te verbeteren.

List of abbreviations



List of abbreviations

AAP	American academy of pediatrics
ASQ:SE	Ages and stages questionnaires: social-emotional
AUC	Area under curve
BITSEA	Brief infant toddler social emotional assessment
CBCL	Child behavior checklist
CFA	Confirmatory factor analysis checklist
CFI	Comparative fit index
CHP	Child healthcare professional
CI	Confidence interval
CIDI	Composite international diagnostic interview
HOMALS	Homogeneity analysis by means of alternating least squares
ICC	Intraclass correlation
ITSEA	Infant toddler social and emotional assessment
KIPPPPI	Short instrument for the psychological and pedagogical inventory
LSPPK	National checklist for indicating psychosocial problems in five/six year olds
MOR	Median odds ratio
OR	Odds ratio
PF	Parent form
PCFI	Parsimony comparative fit index
PCH	Preventive child healthcare
PSC	Pediatric symptom checklist
RCT	Randomized controlled trial
RMSEA	Root mean square error of approximation
SD	Standard deviation
SDQ	Strengths and difficulties questionnaire
SEM	Structural equation modelling
TDS	Total difficulties score
TNO	Nederlandse organisatie voor toegepast natuurwetenschappelijk onderzoek
TPS	Total problems score
TRF	Teacher's report form
USA	United States of America
YSR	Youth self-report
ZonMw	Nederlandse organisatie voor gezondheidsonderzoek en zorginnovatie

Curriculum Vitae



Curriculum Vitae

Meinou Theunissen was born on August 26 1981 in Horn, The Netherlands. She completed secondary school at the “Sintermeertencollege”, in Heerlen in 2000. She received her Master of Science degree in Cognitive Psychology at Maastricht University in 2004. After graduating as a cognitive Psychologist, she started to study Public Health at the department of Health Education at Maastricht University, she received her Master degree in public health in 2008. Since 2007 she works as a researcher at the Netherlands Organisation for Applied Scientific Research TNO, department of Child Health, in Leiden. In this period she conducted her PhD research on the identification of psychosocial problems by Dutch preventive child healthcare that is reported in this dissertation.

Dankwoord



Dankwoord

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