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Preschool Social Participation, the Impact of Early Life Stress and Parental Health

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ABSTRACT

In this article, the association between parental and professional caregivers' perceptions of early life stress (ELS) and the level of preschool social participation was examined, as was the possible moderating effect of parental health. In a community-based study, both parents and professional caregivers of 346 children aged 3 years provided information about child and environmental factors. Results showed that children with ELS more often experienced distress (OR 1.3, $p < 0.001$), had more peer problems (SDQ: $B=0.1$, $p < 0.01$), and more often received extra support according to professional caregivers (OR 1.3, $p < 0.01$). Parents more often reported concerns (OR=1.3, $p < 0.001$), a greater number of concerns ($B=0.3$, $p < 0.001$), and perceived more difficulties in parenting ("parenting" VAS: $B=-2.5$, $p < 0.001$). Associations were stronger for children of parents with "poor health". For personalized family-centred health care, Preventive Child Health Care should systematically explore caregivers' perceptions and concerns of ELS, parental health and child social participation.

Abbreviations: CBCL: Child Behaviour Checklist; C-TRF: Caregiver-Teacher's Report Form; ELS: Early life stress; METC: Medical Centre Medical Ethics Committee; MOM: Monitoring Outcome Measurements of child development study; NOSIK: Parenting Stress Index Short Form; PCHC: Preventive Child Health Care; PEDS: Parents' Evaluation of Developmental Status; SDQ: Strengths and Difficulties Questionnaire; Stata: Statistical Software Package; VAS: visual analogue scale.

KEYWORDS

Early life stress; parental health; preschool social participation; PEDS; personalized preventive child health care

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Introduction

Early life stress (ELS) is a risk indicator influencing child health and wellbeing. Stress can be positive, tolerable or toxic, depending on the nature of the adversity, the individual's stress reactivity and the level of social emotional support (Kushner et al., 2015). Whether someone experiences stress as negative, depends on the extent to which an individual has control over the given stressor and whether the person has coping resources (Enlow et al., 2013; Goldstein & Kopin, 2007; McEwen, 2018; McEwen & Gianaros, 2011; McEwen & Wingfield, 2010; Pfaff et al., 2007).

Toxic stress in childhood links adversity with poor health and health disparities (Garner, 2013; Neigh et al., 2009). In particular, adverse preschool childhood experiences may have a long-lasting impact on brain development (Karatsoreos & McEwen, 2013; Tyrka et al., 2015). Prevention of adverse childhood experiences and supporting resilience is required to improve Public Health (Hughes et al., 2017). However, trauma exposure is not consistently investigated as a possible factor in aetiology of psychological and behavioural problems of young children (Chu & Lieberman, 2010).

Early identification of toxic stress is essential for optimal early intervention and support of the social/educational context, when the probability of re-aligning the trajectory of development and successful social participation is best and treatment, therefore, is more cost-effective (Belsky & Pluess, 2009; Harland et al., 2002; Rhoades et al., 2011; Sroufe et al., 2005; Wakschlag et al., 2010). Early intervention can break the cycle of disadvantage (Currie & Rossin-Slater, 2015; Rhoades et al., 2011). Successful social participation is recognized as an important outcome in young children. When children participate well, they acquire skills and competencies, connect with others and with the community, and find purpose and meaning in life (Gan et al., 2014; Law, 2002; Piskur et al., 2014).

Preventive Child Health Care (PCHC) is the public health endeavour to provide ongoing monitoring up to the age of 18 years (van Esso et al., 2010; Williams, 2016). PCHC is synonymous with Paediatric Preventive Primary Care. The Dutch PCHC system includes preventive health care doctors and has a high level of population compliance (Theunissen, 2013). Monitoring development with knowledge and understanding of genetic and environmental risk and protective factors and their early phenotypes, can help in prevention of "growing into deficit" (Hens, 2017; Syurina et al., 2013) (Figure 1).

PCHC needs to adopt methodologies that incorporate structured assessments for the range of traumatic stressors that are common in infancy and early childhood (Lieberman et al., 2011). To deal with emerging problems and symptoms at a stage where signs and symptoms do not yet meet diagnostic criteria, systematically exploring parental as well as other caregivers' concerns is a main component in PCHC for family-centred practice. This offers PCHC a great opportunity to provide personalized health care (Snyderman, 2012). Parents, teachers/employees from childcare, kindergarten, preschool or primary school (hereafter: professional caregivers) and PCHC professionals are important informants with expert knowledge on child development from different perspectives. The individual's social and educational environment including interpersonal relationships is hypothesized to be key to provide personalized preventive public health care for successful social participation of all children.

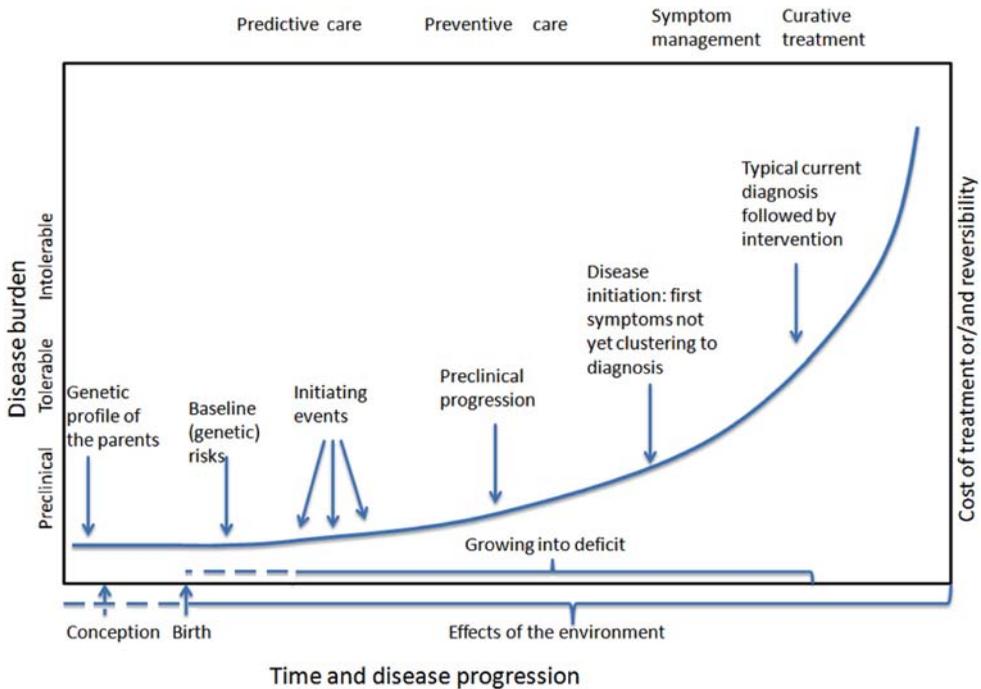


Figure 1. Modification to Syurina’s adaptation of Snyderman’s curve representing the timelines of ‘growing into deficit’ and developing common complex diseases.

It is known that the “goodness of fit” of the transactional relationship between the social context and the child is of importance, in particular for genetically vulnerable individuals (De Schipper et al., 2004; Kuo et al., 2012; Masten, 2014; Van Lier et al., 2007). Social emotional experiences can nurture and build resistance. Non-nurturing environments can generate additional vulnerabilities (Garner, 2013). In particular in the pre-school period, strong social emotional support stimulates effective interactions and promotes emotional regulation in the face of adversities, thereby building resilience (Rutter, 2012, 2013).

Parental problems such as depressive symptoms, posttraumatic stress and adult insecure attachment can undermine a parent’s ability to provide adaptive coping guidance to their children to prevent allostatic overload (McEwen, 2018; National Institute of Child Health and Human Development, 2004). The child’s self-regulation results from patterns of arousal and affect modulation repeatedly experienced in early relationships with their caregivers (Feldman & Vengrober, 2011; Sameroff, 2010; Suzuki et al., 2016). Parental depression has been identified as a psychosocial risk factor associated with reduced positive parenting behaviour, negative perceptions, behavioural problems, poor health and delayed cognitive development of the child (Abaied & Rudolph, 2010a; Bayer et al., 2012; Giallo et al., 2014; Glascoe & Leew, 2010; Raposa et al., 2014). Moreover, parental depression increases the child’s risk of a diagnosis of a mental disorder at the age of four years (Carter et al., 2010). Furthermore, parental stress can counteract the effectiveness of early teaching interventions (Osborne et al., 2008). High levels of parenting stress are related to adolescent depressive symptoms (Nilsen et al., 2013). Therefore, parental

health might impact the association between ELS and social participation. It is hypothesized that if a parent has health problems, this can influence the way the parent acts in times of stress, which in turn can modify the association between ELS and social participation in the child.

Social participation is a broad concept including the objective state and the subjective experience of involvement in society. This concept has to be understood in the light of social roles at home, daycare and preschool (Zubrick et al., 2009). For example, for young children, play is an important social activity. Social participation can be viewed as meaningful engagement with others. Such engagement can work both positively and negatively in social contexts. Meaningful engagement as an outcome cannot directly be measured. Variables of influence on (development of) meaningful engagement with others can be measured as a proxy outcome measurement of social participation. These variables include child competence and child behaviour such as pro-social behaviour, behavioural problems, emotional problems, hyperactivity / attention problems and peer problems. Peer engagement, problem-solving and prosocial skills are part of child general competence, a variable related to school readiness and future social participation (Jones et al., 2015). They are based on the assumption that children of different ages demonstrate these outcomes in different ways with many pathways leading to competence.

This article examines the association between parental and professional caregivers' perception of ELS and social participation at preschool. In addition, the modifying effect of the risk factor "parental health status" was assessed. In this study, social participation is operationalized using various instruments to assess factors underlying social participation: a child's general competence, attendance proportion and extra support (at day care, kindergarten and preschool), the impact of distress, concerns about child development and behaviour, and difficulties in child upbringing and parenting.

Methods

Design and Participants

For the present study, baseline data of 346 children participating the Monitoring Outcome Measurements of child development (MOM) study were used. The MOM study is a prospective cohort study that started in July 2009 and is carried out in the province of Limburg, the Netherlands. General population children were aged 3 years at baseline. The MOM study aims to identify developmental pathways impacting social participation and to guide personalized child health care. MOM is performed in the context of the Dutch PCHC. The study obtains information from parents ($n = 346$), professional caregivers ($n = 103$) like teachers/employees from childcare, kindergarten, preschool or primary school, as well as PCHC professionals ($n = 33$), on baseline risk and environmental factors to track predictive risk indicators for making multiaxial health profiles. Preschool children from a community sample were systematically assessed with a comprehensive preventive child mental health care "toolkit" of instruments.

Parents were asked to participate in the MOM study. Inclusion criterion was age 3 years, there were no exclusion criteria, and 346 children born between 1 October 2006

and 1 January 2009 were included. Baseline data were collected between July 2009 and October 2011. In this article, baseline information of all 346 participating children provided by parents and professional caregivers was used.

Ethics Statement

The Maastricht University Medical Centre Medical Ethics Committee approved the MOM-study protocol under registration number MEC 09-04-018/PL. In accordance with the Declaration of Helsinki, all subjects gave written informed consent after detailed explanation of the study.

Assessments

Early Life Stress (ELS) and ELS Impact factor. To assess early life stress (ELS), parents as well as professional caregivers provided information on life events and the impact of an event in the child's life in 3 domains: in the family, at school and elsewhere (i.e. life event not in the family or at school) (De Loore, 2007; Gunther et al., 2007). Per domain, an open-ended question enquired about the life event with most impact. Because professional caregiver and parent answered the questions independently, they have provided either the same life event or a different one (within the three categories). Consequently, parents and professional caregivers were asked to rate the impact of this event in the child's life on Visual Analogue Scales (VAS) ranging from 1 to 10 (De Loore, 2007; Gunther et al., 2007). It is possible that the parent and professional care giver judged another life-event as having most impact. In the current analyses, these VAS provided by the parents and the professional caregivers were used separately, as well as in combination (highest of the two). In addition, to categorize the open ended answers, the "Psychosocial and Environmental Stressor Checklist" of the Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood: Revised Edition (DC:0-3R) was used to code the open ended answers by two authors independently (BD and BS) (Egger & Emde, 2011; Emde et al., 2005). Disagreements about categorizing were resolved through consensus and discussion with a third author (FF). Categories included amongst others: challenges to child's primary support group, social environment, educational/child care, health of a child, health-care access, finances, housing, occupational, and legal/criminal justice.

Strengths and Difficulties Questionnaire (SDQ). The Dutch version of the Strengths and Difficulties Questionnaire (SDQ) was used by parents as well as by professional caregivers to assess the child's behaviour (Goodman, 2001; van Widenfelt et al., 2003). The SDQ is a brief behavioural screening questionnaire for children aged 3–16 years. It consists of 25 items relating to the child's strengths and difficulties, which are scored on a 3-point Likert scale. The total problem score (0-40) is the sum of the first four subscales: "emotional symptoms", "conduct problems", "hyperactivity/inattention", "peer relationship problems". Higher scores indicate more problems. The subscale "prosocial behaviour" is not included in the total problem score. Each subscale consists of 5 items. The SDQ is considered valid and reliable as a research instrument in community samples (Stone et al., 2010). Recent research shows a parent SDQ sensitivity of 0.76 at a cut-off point with 0.90 specificity in a community population of children at the age of 3–4 years (Theunissen et al., 2015). Both parents and professional caregivers completed in

the SDQ. For the present paper, the SDQ sum score was used, as well as the subscores peer problems and pro social behaviour. The SDQ includes items that identify the impact of the behavioural problems of the child, the SDQ impact of distress. Although, parental SDQ was included in the analysis, the SDQ impact was generated using information from both parents and professional care givers in order to gain as much insight as possible into emerging problems and symptoms. If any of the parents or professional caregivers scored “yes” on the impact probe question, in this study the dichotomous overall distress variable was set at “yes”.

Child Behaviour Checklist (CBCL). Parent-reported behaviour problems of the children were assessed using the Child Behaviour Checklist (CBCL), Dutch version 1½–5, 2001 (Achenbach et al., 1991). It consists of 120 items on behaviour and emotional problems, rated on a 3-point Likert scale (Achenbach et al., 2008; Achenbach & Ruffle, 2000; Verhulst & Koot, 1996). Good reliability and validity have been reported for the CBCL/1.5-5, also in the Netherlands (Ivanova et al., 2010).

Caregiver-Teacher’s Report Form (C-TRF). Professional caregivers reported behaviour problems using the Caregiver-Teacher’s Report Form (C-TRF) Dutch version 1½ –5 (Verhulst & Koot, 1997). It consists of almost the same 120 items as the CBCL.

In the present study, the continuous total problem score of the CBCL and the C-TRF were used. Both the CBCL and C-TRF sum scores included the first 100 items.

Attendance in class. To objectively quantify participation, attendance proportion at day-care, kindergarten and preschool was estimated by asking professional caregivers how many periods (mornings, afternoons) per week the child was supposed to be present, and how many periods the child was actually there on average.

Child competence VAS. To address the issue of the child’s functional adaptation, professional caregivers were asked to indicate, on a VAS, the degree of competence of the child in general (0= not competent, 100= very competent).

Extra support. In addition, professional caregivers were asked to report whether children received extra support, in- or outside school.

Parenting VAS. In order to quantify self-rated parental competencies, a VAS ranging from 0–100 was used; parents expressed the degree to which they felt competent, secure and happy with raising their child (0 = I do not manage to raise my child as I wish, 100 = raising my child is up to my expectations).

Child behaviour VAS. Another VAS assessed how the parents evaluated their child’s behaviour (0 = my child is difficult and badly behaved, 100 = my child is very obedient and easy to handle).

Parents’ Evaluation of Developmental Status (PEDS). The PEDS is a 10-item parent as well as professional caregivers completed standardized semi-structured questionnaire to elicit concerns and facilitate communication between professionals and parents in addressing developmental problems in children aged less than 8 years, in the general population and clinical samples (Glascoe, 2013). PEDS questions include items on expressive and receptive language, fine motor, gross motor, behaviour, socialization, self-care and learning. A dichotomous parental concerns variable (any concern yes/no) was constructed for use in the analyses.

In a previous article, the 3 VAS to assess “child competence”, “parenting” and “child behaviour”, as well as the parental and professional caregivers PEDS were validated for use in daily Dutch PCHC practice (Doove et al., 2019). All five instruments were

strongly associated with various validated constructs. In addition, reliability was good. Finally, criterion validity was assessed using “reference standard” instruments: the CTR-F was the reference standard for the “child competence” VAS, the CBCL was the reference standard for the “child behaviour” VAS and the Parenting Stress Index Short Form (in Dutch abbreviated as NOSIK) (De Brock et al., 1992) was the reference standard for the “parenting” VAS. Reference standard of the parental and professional caregiver PEDS were the CBCL respectively the C-TRF. Although the “child competence” VAS scored lower on one aspect of validity, results suggest that the PEDS and the different VAS are reliable, valid and useful as brief monitoring tools in every day Dutch PCHC practice.

Parental Health. Parents were asked to judge their own physical and mental health as well as the physical and mental health of the other parent/caregiver, using a 5-point Likert Scale from 1 (bad) to 5 (excellent). Self-rated health status is a simple, yet widely used, measure with similar validity as more sophisticated health assessments; it is also a reliable predictor of mortality and health care use in adults (Bombak, 2013). As described earlier (Doove et al., 2019), MOM included an extra data collection to assess reliability. The intra-rater test-retest reliability showed strong and significant correlations (Spearman correlation: parental and co-parental physical health = 0.92 and 0.99, respectively, $p < 0.0001$; parental and co-parental mental health = 0.93 and 1.00, $p < 0.0001$ available upon request/unpublished results). The four health variables were combined into one parental health variable, which was then dichotomized (fair and poor were recoded into 1 and excellent, very good and good were recoded into 0).

Socioeconomic status. As an indicator of socioeconomic status, the level of maternal and paternal education was assessed in 3 categories: low (primary education, junior vocational education), middle (general secondary education, senior vocational education) and high (preparatory university education and university education). The individual with the highest level of education determined parental educational level.

Statistical Analyses

All analyses were performed using Stata (Statistical Software Package), version 15 (Stata-Corp., 2017). Logistic and linear regression analyses of baseline data were performed. In all analyses, the independent variable was ELS. Dependent variables were social participation operationalised in various ways. Logistic regression was performed to analyse presence of PEDS concerns, SDQ impact of distress, attendance in class and presence of extra support. Linear regression analysis was performed to analyse number of PEDS concerns, SDQ total score, the SDQ subscales “peer problems” and “pro-social behaviour”, CBCL total score, C-TRF total score, “child behaviour” VAS, “child competence” VAS, and “parenting” VAS. Analyses were adjusted for age, sex and educational status of the parents.

Furthermore, the interaction term between ELS on the one hand and “parental health status” on the other was included in the models analysing all outcomes. When the interaction term was non-significant, it was removed from the models. When there was significant interaction between “parental health status” and ELS, the Stata post estimation command `lincom` was used to calculate stratified results.

Results

Parents of 346 children agreed to participate in the MOM study. In the caseload of participating doctors, response was 50–70%, but not all doctors participated (see discussion). Parents of 341 children and professional caregivers of 300 children completed the questionnaires. For 291 of these children (84%), information from both informants was available. Of the participating children, 60% ($n = 207$) were resident in the municipality of Maastricht, while 40% ($n = 139$) lived in the surrounding area. **Table 1** shows the background characteristics of the study respondents' sample at baseline. For one child there was no information whether the child experienced life events. ELS in the areas of challenges to the child's primary support group (60%), education/child care (22%) and health (12%) were reported most frequently. Descriptive of the outcomes used to index "Social participation" are shown in **Table 2**.

Table 1. Background characteristics of the study respondents' sample at baseline.

	N		Number (%)	
Gender	346	Girls	180 (52%)	
		Boys	166 (48%)	
Parental Health status	341	Poor health ²	48 (14%)	
Parental educational status	335	High	212 (63%)	
		Medium	92 (28%)	
		Low	31 (9%)	
Early Life Stress (ELS)	345	Presence of ELS (Parents or prof. ¹)	115 (33%)	
Age children	346	Parents	Mean (SD)	Range
	301	Prof. ¹	3.0 (0.2)	1.8-3.9
Impact factor ELS ³	91	Parents	3.1 (0.2)	1.8-3.8
	42	Prof. ¹	3.8 (2.6)	1-10
	107	Parents or prof. ¹	3.7 (2.4)	1-9
			4.0 (2.5)	1-10

¹Professional caregivers.

²Combined physical and/or mental health: poor or fair.

³Only scored when ELS is present.

Table 2. Descriptive of the outcomes used to index 'Social participation' ($N = 346$).

	N	Number (%)	
Presence PEDS concerns (parents)	339	147 (43%)	
Extra support children receive (prof. ¹)	293	22 (8%)	
SDQ—impact of distress (parents and prof. ¹)	295	62 (21%)	
		Mean (SD)	Range
Number of reported PEDS concerns (parents)	339	1.0 (1.6)	0-10
Number of reported PEDS concerns (parents) if present	147	2.4 (1.7)	1-10
SDQ-total-score (parents)	338	6.8 (4.9)	0-28
SDQ-score peer problems (parents)	338	1.3 (1.5)	0-8
SDQ-score pro social behaviour (parents)	339	8.0 (1.7)	1-10
CBCL-total-score (parents)	331	21.3 (19.2)	0-117
C-TRF-total score (prof. ¹)	289	13.2 (17.1)	0-92
Child behaviour (parents) ²	329	66.3 (17.8)	1-97
Child competence (prof. ¹) ³	290	63.6 (19.7)	4-100
Parenting (parents) ⁴	327	70.3 (18.8)	6-100
Child's % of attendance in class ⁵	282	98.6 (6.7)	50-100

¹Professional caregivers.

²A higher VAS score means parent judges child behaviour more positive.

³A higher VAS score means professional caregiver judges child competence more positive.

⁴A higher VAS score means parent judges parenting more positive.

⁵This is presence in class (quantitative participation) and was measured as a % of hours of enrolment per individual child. In 5% ($n=13$) of the children attendance was not 100%.

Parental health status was associated with various variables used to index social participation (presence of PEDS) concerns, SDQ impact of distress, number of PEDS concerns, child competence, parenting, child behaviour, SDQ sum score, CBCL sum score, C-TRF sum score (data not shown).

Association between ELS and Various Outcomes

Children with ELS more often received extra support (OR=1.3, $p=0.001$) and more often experienced distress (OR=1.3, $p<0.001$), while their parents reported PEDS concerns more often (OR=1.3, $p<0.001$, Table 3). The number of concerns was also higher ($B=0.3$, $p<0.001$). Furthermore, parents of children with ELS perceived more difficulties in child upbringing (“parenting” VAS: $B=-2.5$, $p<0.001$) and peer problems (SDQ $B=0.1$, $p<0.01$, Table 4). None of these associations was moderated by “parental health status”. Parental health status interacted with ELS in the model of SDQ total sum score ($F=8.6$, $df=1,3$, $p=0.0036$) and CBCL total sum score ($F=9.7$, $df=1,3$, $p=0.0021$). Thus, the association between ELS and SDQ total sum score was stronger in children with parents with poor health than in children with parents with fair health ($B=1.2$, $p<0.001$ and $B=0.4$, $p=0.002$, respectively, Table 5). A similar moderating effect was observed for the outcomes of CBCL and C-TRF.

Table 3. Logistic regression analysis: the association between ELS and dichotomous variables indicating quality of social participation (i.e. need for extra support, concerns, attendance); odds ratios (OR) and 95% confidence intervals (CI), according to parents ($n=341$), professional caregivers ($n=300$) or both ($n=345$).

	OR	CI
Extra support children receive (prof. ¹)	1.3 **	1.1; 1.5
Presence PEDS concerns (parents)	1.3 †	1.1; 1.4
Attendance in class (prof. ¹)	1.0	0.8; 1.3
SDQ—Impact of distress (parents and prof. ¹)	1.3 †	1.2; 1.5

* $p < 0.05$; ** $p < 0.01$; † $p < 0.001$.

¹Professional caregivers

Controlled for confounders (age, gender, parental educational status)

The interaction terms parental health status X ELS were not statistically significant.

Table 4. Linear regression analysis: the association between ELS and quality of social participation (number of concerns, child competence and parenting); B's and 95% confidence intervals (CI), according to parents ($n=341$), professional caregivers ($n=300$) or both ($n=345$) Controlled for confounders (age, gender, parental educational status).

	F	p	df	B	CI
Number of PEDS concerns (parents)	15.3	< 0.0001	4, 319	0.3 †	0.2; 0.3
Child competence (prof. ^{1,2})	7.9	< 0.0001	4, 272	-0.8	-1.8; 0.2
Parenting (parents) ³	12.3	< 0.0001	4, 307	-2.5 †	-3.4; -1.6
SDQ- peer problems (parents)	3.9	0.0045	4, 318	0.1 **	0.0; 0.2
SDQ -prosocial behaviour (parents)	3.9	0.0040	4, 319	-0.0	-0.1; 0.0
Child behaviour (parents) ⁴	6.1	0.0001	4, 309	-1.8 †	-2.6; -0.9

* $p < 0.05$; ** $p < 0.01$; † $p < 0.001$.

¹Professional caregivers.

²A higher VAS score means professional caregiver judges child competence more positive.

³A higher VAS score means parent judges parenting more positive.

⁴A higher VAS score means parent judges child behaviour more positive.

The interaction term 'parental health status' X ELS was not statistically significant.

Table 5. Linear regression analysis (significant interaction with one or both risk factors): association between ELS and quality of social participation; B's and 95% confidence intervals (CI), according to parents (n=341), professional caregivers (n=300) or both (n=345).

	Interaction term (F-test) ¹			Parental health B (CI)	
	F	p	df	Fair	Poor
SDQ sum score	8.6	0.0036	1, 316	0.4 ** (0.2; 0.7)	1.2 † (0.7; 1.7)
CBCL sum score	9.7	0.0021	1, 311	2.4 † (1.5; 3.4)	5.4 † (3.7; 7.0)
C-TRF	6.3	0.0125	1, 269	0.5 (-0.5; 1.5)	3.3 ** (1.4; 5.2)

* $p < 0.05$; ** $p < 0.01$; † $p < 0.001$.

¹Regression coefficient of interaction term parental health status X ELS. Controlled for confounders (age, gender, parental educational status).

Discussion

Results of this study showed that ELS is associated with reduced quality of social participation in three-year olds as assessed using child's general competence, attendance proportion and extra support (at day care, kindergarten and preschool), the impact of distress, child development and behaviour concerns, and difficulties in child upbringing and parenting. When parental health was low the association between ELS and several dimensions of social participation (SDQ total, CBCL and C-TRF) was stronger.

The association between ELS and reduced quality of social participation is in line with a recent study showing an association between ELS and behavioural problems and poorer psychosocial functioning in preschoolers (Jimenez et al., 2016). Other research showed associations between ELS, reduced social participation and adverse consequences such as mental problems, learning disabilities, early school dropout, underachievement, unemployment, low socioeconomic status, poverty, antisocial behaviour and substance abuse (Luby et al., 2013; Shevell et al., 2005; Taylor et al., 2008). These associations emphasize the importance of early identification of the impact of ELS.

While ELS is common (Bonanno & Mancini, 2008; Burke et al., 2011; Committee on Psychosocial aspects of Child and Family Health and Task Force on Mental Health, 2009; Neigh et al., 2009), it is important to know the prevalence and incidence of various types of ELS, rather than limiting attention to one specific type (Hughes et al., 2017). Identifying less significant forms of ELS is a challenge, as these can have significant impact (Chu & Lieberman, 2010; Saunders & Adams, 2014). With this knowledge early identification is possible and therefore early intervention when signs and symptoms do not yet meet diagnostic criteria.

The interaction with parental health could have been expected as well, because other studies showed that both familial (genetic and non-genetic) and non-familial environmental factors may moderate ELS effects (Belsky & Pluess, 2009; Claessens et al., 2011; Karatsoreos & McEwen, 2013; Kushner et al., 2015; Neigh et al., 2009). In addition, parental health can impact the child's health indirectly via the pathway of emotional neglect (Musa et al., 2018). This interaction shows the importance of systematically asking the parent about perceptions of parenting and parental health.

Methodological Issues

General population preschool children were systematically assessed using a comprehensive PCHC "toolkit" of instruments. The baseline results presented in the current paper are cross-sectional, but in future, children can be followed over time.

Strength of the present study is that the child's participation is evaluated in different situations with information from multiple informants. ELS in 3-year-old children was obtained through hetero-anamnesis of parents and professional caregivers (Wolraich et al., 1996). Data provided by the PCHC professionals are not included in the present paper, but will be reported separately. In addition, this study is based on real life practice. No children were excluded for not meeting inclusion criteria.

The present paper also has some limitations. First, a power calculation for the present research question showed that the number of subjects is sufficiently large to show medium effect sizes (Cohen's $D=0.5$), but underpowered to show smaller effect sizes. Any future replication of the current results will require a larger sample size. Nevertheless, respondents are representative for the South Limburg population (Doove et al., 2019). In addition, the distribution of parental education in non-responders was only slightly different from distribution in responders (responders 63%, 28%, 9% and non-responders 55%, 33%, 12% having high, intermediate and low parental education, respectively, chi-square=5.0, $p=0.08$) (Doove et al., 2019).

Secondly, since the MOM data are limited to Maastricht and surrounding area the findings of this study may not necessarily be valid for PCHC settings in other parts of the Netherlands and abroad. This part of the Netherlands is quite similar to the rest of the country. However, there are some differences. In Maastricht, the proportion of non-European inhabitants (about 10%) is less than in the larger cities in the north west of the country (about 30%) (Tjin-A-Tsoi, 2016). For this reason, the MOM study findings may not necessarily be valid for large cities with ethnically mixed populations.

Moreover, the primary support network of a child and its family is relevant. Social support reduces stress. Another source of resilience is language and cognitive skills. It supplies a child with the necessary support to cope with stress and leads to resilience (adaptive behaviour) in the light of stressful life events (Garner, 2013; Jackson et al., 2007; Jackson & Warren, 2000; Milot et al., 2010). No information with respect to the child's social support network (other than parents) was included in the present study. In future studies this should also be included.

Finally, an illness in a parent ("parental health status") can be a life event. Therefore, a sensitivity analysis was performed excluding the children whose ELS consisted of deceased or unhealthy parents ($n=3$). All results were similar to the original results (data not shown).

Recommendations and Conclusions

To effectively address the health and well-being of children, PCHC must consider the educational context and not just the child (Schor, 2003). The process of development and social participation evolves as a "dynamic cascade" of risk and protective factors that exist not in isolation but are continuously shaping one another (Sameroff, 2010). Children's development and health are strongly influenced by how well their family functions. Health care professionals should be alert for parental health, and any imbalance between the parents' need for support and the support they actually receive (Holopainen & Hakulinen, 2019). For children to be able to flourish and cope with stress, the quality of parental support and the educational context represent an important resource for

successful social participation across the life span (Abaied & Rudolph, 2010b; Natsuaki et al., 2007; Suzuki et al., 2016). For early identification of children at risk for developmental delay, PCHC professionals should acknowledge current constraints of families and may examine the presence and impact of ELS in the lives of children and the health of their parents (Chu & Lieberman, 2010). Therefore, PCHC workers have the important task to move beyond the disease classifications and to characterize the full palette of phenotypes of developmental profiles of children with multi-axial information (Syurina et al., 2013).

This study confirms that parental and professional caregivers' perceptions and concerns are to be taken seriously (Gallegos et al., 2019; Vreeswijk et al., 2015). In addition, PCHC is capable of adopting methodologies that incorporate structured assessments for the range of traumatic stressors that are common in infancy and early childhood. Short validated instruments with information from parents and professional caregivers do support ongoing communication on social participation, emerging problems and "shared decision making" (Huber et al., 2016).

The design of the MOM study illustrates a paradigm shift from the curative approach towards personalized preventive, predictive and participatory public health care (Snyderman, 2012).

Important are preventive interventions aimed at easing the transition to parenthood, to support parenting self-efficacy and to control toxic stress. Being a parent is not just about parenting, it is a transition process that affects different aspects of a person's life such as relationships, work, finance, housing. Family Foundations is an example of a brief, universal, transition-to-parenthood intervention for couples to strengthen their cooperative relationship (Feinberg et al., 2016). This prevention programme benefits all families, particularly families at elevated prenatal risk.

Furthermore, personalized health care requires optimal collaboration between parents, practice, policy and research, for cross-domain knowledge transfer and exchange to address the health of the child as well as the needs of the family (Schor, 2003). Then, personalized PCHC can be offered to support the capacity of parents and other caregivers and stimulate their health literacy in order to lower toxic stress and develop strong responsive early relationships with their children.

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