


REGULAR ARTICLE

Social-emotional problems among three-year-olds differ based on the child's gender and custody arrangement

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Keywords

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BACKGROUND

Sweden has a long tradition of monitoring children's development and growth through universal Antenatal Care and Child Health Care (CHC), which aim to promote health and prevent disease. Unresolved vulnerabilities early in life affect the child's general well-being and also shape their development into adulthood. There is evidence that psychological problems in early and mid-childhood are important determinants of mental health problems in adolescence and psychiatric disorders in adulthood (1). Importantly, there is strong evidence to support interventions among young children with behavioural problems, especially when they are exposed to multiple contextual risk factors (2). A study of Danish schoolchildren 1991–2014 (3) showed an increasing prevalence over time of daily emotional symptoms in parallel with diminishing social inequality. However, so far preschool children's

Abbreviations

ASQ:SE, Ages and Stages Questionnaires: Social-Emotional; CHC, Child Health Care.

ABSTRACT

Aim: The aim of this study was to investigate mental health with respect to social-emotional problems among three-year-olds in relation to their gender, custody arrangements and place of residence.

Methods: A cross-sectional population-based design was used, encompassing 7179 three-year-olds in northern Sweden during the period 2014–2017 from the regional Salut Register. Descriptive and comparative analyses were performed based on parents' responses on the Ages and Stages Questionnaires: Social-Emotional, supplemented with items on gender, custody arrangement and place of residence.

Results: Parental-reported social-emotional problems were found in almost 10% of the children. Boys were reported to have more problems (12.3%) than girls (5.6%; $p < 0.001$). Parents were most concerned about children's eating habits and interactions at mealtimes. Parents not living together reported more problems among their children than those living together ($p < 0.001$). When stratifying by custody arrangement, girls in rural areas living alternately with each parent had more problems compared to those in urban areas ($p < 0.008$).

Conclusion: Gender and custody arrangements appear to be important factors for social-emotional problems among three-year-olds. Thus, such conditions should receive attention during preschool age, preferably by a systematic preventive strategy within Child Health Care.

mental health has not received proper attention in research. Knowledge is limited in terms of incidence and its relation to gender, social and demographic factors (4). Hence, a systematic identification of children's developmental and behavioural problems is required (5), which has also been called for by Swedish national authorities. A prevalence study carried out in the USA (6) revealed that

Key notes

- Knowledge on preschool children's social-emotional problems and their relation to gender, social and demographic factors are limited.
- Almost one out of ten three-year-olds had parental-reported social-emotional problems, these being twice as common among boys than girls and related to the custody arrangement.
- The study findings highlight the importance of identifying social-emotional problems at an early age within Child Health Care and of taking gender differences and custody arrangements into account.

more than one-fifth of the child population three years or younger had mental health problems. In a similar study in Denmark (7), the prevalence of mental health disorders among preschool children was reported to be 18%, with boys having higher rates of both behavioural and developmental disorders, while girls more often had disorders in the areas of eating, attachment and adjustment. Findings of a study of Nordic children aged two to nine years (8) supported that parents' living arrangements affects children's psychological health. Children in single-parent care had more psychological problems than children in intact families and children in joint custody. Children's health is dependent on and integrated with the social, psychological and physical environments they live in, such as family and living situation. It is well-conceived that mental health is closely linked to social and demographic factors, implying that relevant subgroup analyses are necessary to describe and understand mental health problems of young children (4). The aim of this study was to investigate mental health with regard to social-emotional problems among three-year-olds with respect to gender, custody arrangement and place of residence.

METHODS

Study design and context

This is a cross-sectional population-based study in Västerbotten County in northern Sweden. The county has around 3000 births annually and 40 CHC centers for children up to six years of age. The study was nested within the Salut Child Health Promotion Programme, a promising universal intervention implemented within ordinary CHC (9). The Ages and Stages Questionnaires: Social-Emotional (ASQ:SE) have been used for three-year-olds since 2014. The questionnaire was introduced to increase staff and parent awareness of children's social and emotional development, facilitate a staff-parent dialogue and identify children in need of extra support, but also for epidemiological surveillance.

Study participants

This study involved 8214 three-year-olds recruited from January 2014 to September 2017, which corresponded to 80% of those living in the county. Out of these, 7179 children were finally included, corresponding to 70% of all potential participants. Thus, 1035 children were excluded for reasons described in the following. For 513 children, their age was outside the ASQ:SE-approved range for the 36-month version, which is from 33 to 41 months of age (10). Another 447 children were excluded due to lack of parental consent for the research. The remaining 75 children were excluded because the ASQ:SE had not been properly filled out by the parents.

Questionnaire – items and definitions

The ASQ:SE was developed by Squires et al. (10,11). The questionnaire is considered to reflect social and emotional problems of young children and to be both cost-effective

and has good psychometric properties. The questionnaire consists of 34 items. Out of these, 30 items are divided into the following psychological domains: self-regulation, compliance, adaptive functioning, autonomy, affect, communication and interaction. For 31 items, the parent indicates on a three-point Likert scale how they perceive their child's behaviour and whether this behaviour is a concern for them. This results in a total score of 0–465 points, where a value of 59 or above has been suggested to indicate social-emotional problems based on US studies (10). In this study, we used the first edition of the ASQ:SE for the 36-month version 1.5 (10). To get a Swedish version of the ASQ:SE, a translation/back-translation according to established recommendations was performed (12). In addition to the ASQ:SE, supplementary information was collected, such as custody arrangement: if the child was living with both parents, alternately with each parent, exclusively with one parent or with another person and siblings (or without siblings). The CHC centre where the child was registered was used to determine whether the place of residence was an urban or rural area.

Statistical analyses

The ASQ:SE User's Guide was followed when calculating the total mean score for all children and specific subgroups (10). Out of the 31 items, up to three missing values were handled by imputation of the average value from all the other responses. Questionnaires with more than three values missing were excluded. When analysing individual items, imputation was not used. A total mean score of 59 and above was considered to represent social-emotional problems in accordance with the ASQ:SE User's Guide (10). The age of the child was calculated by subtracting the birth date from the date of visit. We performed cross-sectional descriptive and comparative statistical analyses. We calculated the ASQ:SE total mean score and standard deviation (SD) for all children and for subgroups. For each item, we calculated the distribution of responses separately for boys and for girls. Pearson chi-square tests and Independent Samples *t* tests were used to analyse group differences for categorical and continuous variables, respectively. When analysing differences between more than two groups, Welch's ANOVA test with Dunnett's T3 *post hoc* test was used. To quantify the gender difference for each item, we used the effect size measure Cramer's V with the guidelines of Cohen (13). It means that for degrees of freedom equal to two; 0.07 was considered a small effect, 0.21 a medium effect and 0.35 a large effect. Data were analysed using SPSS Statistics version 24.0 (IBM, New York, NY, USA). The significance limit chosen for this study was 0.05, except for the multiple comparisons where we used the limit 0.001 as guided by a Bonferroni correction.

Ethics

The Regional Ethical Review Board in Umeå has approved the study (2013-268-31Ö). Only children whose parents gave informed consent were included in the study.

RESULTS

Characteristics of the children and their families

The mean age of the 7179 children (52% boys) was 36 months in the range 33–41 months. The majority of questionnaires were completed by the parents jointly (62%) and the remainder by mothers alone (34%), fathers alone (4%) or by another person such as a foster parent (1%). Most children's parents were living together (92%) and the remaining children were living alternately with each parent (5%), exclusively with one parent (3%) or with another person (<1%). It was common to have siblings (75%) and most families lived in an urban area (69%). There was no gender disparity in relation to custody arrangements, prevalence of siblings or place of residence (data not shown).

Social-emotional problems for boys and girls

The ASQ:SE total score had a mean of 27.7 ± 23.2 , a range of 0–215 and 9% of the children ($n = 654$) had a value above the recommended cut-off (59 points). Boys had a total mean score of 31.2 (SD 24.9) with a range of 0–215 and girls had a total mean score of 23.9 (SD 20.6) with a range of 0–210 ($p < 0.001$). More boys (12.3%) than girls (5.6%) had scores above the cut-off ($p < 0.001$; Fig. 1). The distribution of ASQ:SE scores per item (0–15 points) for boys and girls, sorted by domain, is presented in Table 1. For both genders, the items with the highest proportion of highest scores (10 or 15) focused on whether the child seemed more active (item 12), expressed strong emotions (item 19) and whether the child in a new situation checked back to the parent (item 20). Boys had a significantly higher mean total score for 17 out of the 31 items (55%) compared to girls. This result indicated more social-emotional problems, although all effect sizes were rather small (Table 1). The items with the greatest gender disparity concerned whether the child seemed more active than other children

(item 12), whether the child broke things (item 24) and whether the child used words to describe their own or others' feelings (item 29).

ASQ:SE stratified by gender, custody arrangements and place of residence

The ASQ:SE mean total scores for children stratified by gender and custody arrangement are shown in Table 2 and Figure 2. There was a clear pattern where boys had higher ASQ:SE mean values than girls, regardless of custody arrangement. Notably, the ASQ:SE mean total score varied with custody arrangement. The lowest scores were found for both boys and girls whose parents were living together and then increased stepwise for children living alternately with each parent and those living exclusively with one parent. The highest ASQ:SE mean values were found among children living with a person other than a parent. However, this latter group was excluded from the statistical comparison due to small sample size. There was an overall significant difference between the six remaining groups (p -value < 0.001) with the ASQ:SE mean total score ranging from 23.3 among girls with parents living together to 41.3 among boys living exclusively with one parent. *Post hoc* significant differences were found to a higher extend between children with parents living together compared to children involved in other custody arrangements (Fig. 2, Table 2). The ASQ:SE mean total score did not differ significantly between children living in urban areas and rural areas when analysing boys and girls separately (Table 3). When stratifying for children's different custody arrangements, problems were reported to a higher degree in rural areas compared to urban areas in the categories of children living alternately with each parent or exclusively with one parent, but this was only statistically significant ($p < 0.008$) for girls living alternately with each parent (Table 3).

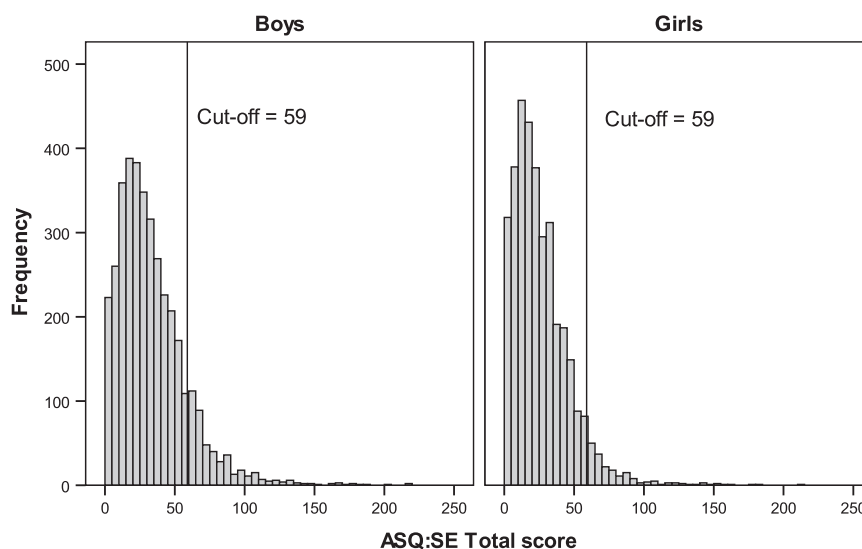


Figure 1 Distribution of Ages and Stages Questionnaires: Social-Emotional (ASQ:SE) total scores for boys ($n = 3719$) whereof 459 (12.3%) were above cut-off, and total scores for girls ($n = 3460$) whereof 195 (5.6%) were above cut-off.

Table 1 Distribution of Ages and Stages Questionnaires: Social-Emotional (ASQ:SE)* scores per item (0–15 points) for boys and girls, sorted by domain, and with effect sizes given

Domains	ASQ:SE item no	Boys† (%)				Girls† (%)				p value‡	Effect size§
		0	5	10	15	0	5	10	15		
Self-regulation	5	90.5	8.2	1.1	0.2	92.1	6.8	1.0	0.1	0.043	0.030
	7	66.4	31.4	1.8	0.4	73.4	25.1	1.2	0.3	0.000	0.078
	8	79.3	19.1	1.3	0.3	87.5	11.6	0.8	0.1	0.000	0.108
	12	63.1	26.9	8.9	1.1	73.7	21.1	4.9	0.3	0.000	0.123
	13	92.0	7.5	0.4	0.1	92.7	6.9	0.4	0.0	0.492	0.014
	19	64.5	24.8	10.2	0.5	66.8	22.5	10.4	0.3	0.057	0.028
	21	81.0	16.8	2.0	0.2	81.5	16.7	1.7	0.1	0.358	0.017
	24	66.3	31.9	1.6	0.2	80.1	18.9	0.9	0.1	0.000	0.156
Compliance	11	56.7	42.4	0.8	0.1	62.9	36.7	0.3	0.1	0.000	0.064
	18	62.3	35.9	1.5	0.3	68.7	30.2	1.0	0.1	0.000	0.070
Communication	1	92.7	6.6	0.6	0.1	95.7	3.9	0.3	0.1	0.000	0.064
	17	94.1	4.3	1.1	0.5	97.3	2.2	0.3	0.2	0.000	0.081
	25	85.0	11.2	3.1	0.7	92.5	6.3	0.9	0.3	0.000	0.124
Adaptive function	15	87.4	7.8	3.5	1.3	89.5	6.5	3.2	0.8	0.037	0.030
	16	98.6	1.2	0.2		99.0	0.8	0.2		0.236	0.020
	22	96.8	2.6	0.5	0.1	97.4	2.4	0.2	0.0	0.019	0.033
	23	86.3	10.3	3.2	0.2	89.3	6.9	3.7	0.1	0.000	0.060
	30	99.4	0.5	0.1	0.0	99.2	0.7	0.1	0.0	0.621	0.012
Autonomy	4	72.0	24.7	3.0	0.3	71.2	26.3	2.4	0.1	0.075	0.027
	20	55.5	36.7	7.2	0.6	59.4	34.0	6.3	0.3	0.004	0.040
Affect	2	88.0	11.8	0.2		91.2	8.6	0.2		0.000	0.053
	9	98.0	1.7	0.3		98.4	1.4	0.2		0.360	0.017
	10	98.5	1.4	0.1	0.0	98.8	1.1	0.1		0.195	0.021
Interaction	3	96.7	3.1	0.2		97.1	2.8	0.1		0.094	0.026
	6	78.2	16.9	4.4	0.5	81.8	14.4	3.5	0.3	0.001	0.044
	14	68.5	27.6	2.9	1.0	73.5	23.7	2.3	0.5	0.000	0.057
	26	92.6	4.9	2.1	0.4	96.8	2.3	0.8	0.1	0.000	0.091
	27	91.2	8.2	0.5	0.1	95.7	4.2	0.1	0.0	0.000	0.089
	28	90.0	9.2	0.6	0.2	93.6	6.0	0.4	0.0	0.000	0.065
	31	93.8	4.8	1.3	0.1	96.4	3.1	0.5		0.000	0.062

*The Ages and Stages Questionnaires: Social-Emotional version 1.5 for three-year-olds.

†Number of valid responses per item ranged from 3702 to 3752 for boys and 3453 to 3487 for girls, out of a total of 3719 and 3460, respectively.

‡p-value for testing between boys and girls with the response categories 10 and 15 merged. Chi-square test with significance limit 0.001 due to Bonferroni correction.

§Effect size measure Cramer's V.

Parental concern

The ASQ:SE items that were indicated as concerns by more than 1% of the parents are listed in Table 4 by order of magnitude. The items ranked at the top were related to eating habits and the interactions surrounding mealtimes for all children (item 15 and 14).

DISCUSSION

This study investigated the mental health of three-year-old children with respect to social-emotional problems and

yielded the following key findings. Firstly, almost one in ten three-year-olds had social-emotional problems, as reported by their parents. Secondly, gender differences were evident, with twice as many boys compared to girls having parent-reported social-emotional problems. Thirdly, parents were most concerned about children's eating habits and the interactions surrounding mealtimes. Finally, parents that were not living together reported more social-emotional problems in their children than those living together, and to a higher extent if they were living in rural areas compared to urban areas. Findings

Table 2 Ages and Stages Questionnaires: Social-Emotional (ASQ:SE)* mean total score (SD) for all children, and for boys and girls respectively, in relation to custody arrangement

Parents who live together	Alternately with each parent			Exclusively with one parent			With another person				
	Boys (n = 3147)	Girls (n = 3327)	All (n = 331)	Boys (n = 175)	Girls (n = 156)	All (n = 224)	Boys (n = 134)	Girls (n = 90)	All (n = 17)	Boys (n = 6)	Girls (n = 11)
27.0 (22.6)	30.5 (24.3)	23.3 (20.0)	30.8 (23.1)	34.0 (24.6)	27.1 (20.8)	38.3 (29.3)	41.3 (31.6)	34.0 (25.0)	57.7 (56.5)	64.5 (36.9)	54.0 (66.2)

*The Ages and Stages Questionnaires: Social-Emotional version 1.5 for three-year-olds.

are discussed below and implications for practice and research are proposed.

ASQ:SE stratified by gender, custody arrangements and place of residence

The study revealed that 9% of the three-year-olds had parent-reported social-emotional problems according to ASQ:SE. This was considerably lower than the reported prevalence in the USA of 22.4% among children aged six to 36 months using the ASQ:SE (6). However, the same comparatively low prevalence as in this study has been reported among preschoolers in the Scandinavian countries (14,15) using the Strengths and Difficulties Questionnaire. In contrast, the prevalence of mental health disorders was identified as high as 18% of 1½ year-olds in a Danish child cohort (7). However, the Danish children were analysed through a wide range of instruments and interviews. The reasons for the discrepancy between the studies might be explained by differences in the selection of study participants, instruments used and how the items have been perceived in different contexts. Moreover, parents of boys reported significantly more social-emotional problems (12.3%) than parents of girls (5.6%). This gender difference in mental health problems has been previously observed both among preschoolers in Sweden (16) and outside Scandinavia (17,18). Notably, for children of school age, the gender imbalance is reversed. A comprehensive review of the mental health problems of school-aged children in Sweden (4) indicated that girls reported significantly more psychological symptoms than boys. This age disparity regarding gender patterns in mental health could be explained by different measures used in younger and older children. At an early age, children's mental health is mainly assessed through parental observations and questionnaires, while older children's mental health is usually self-reported. In addition, boys' expressions of mental health problems may be easier to observe as these are more externalised and therefore to a larger extent reported by parents. Internalised psychological symptoms are more common among girls (4) and demand more developed communication skills to be verbalised, and thus could easily be missed in reports by parents of younger children.

The study findings support the relationship between custody arrangements and psychological symptoms that has previously been reported (8). One reason for this relationship could be that a parent living alone with a child is psychosocially and socioeconomically more vulnerable. As the children in this study were only three years old, the parents' separation must have been rather recent. Therefore, the social-emotional problems reported could reflect the psychological stress from a recent family change and efforts to settle into the new family arrangement. A previous study (19) showed that household wealth affects children's emotional and behavioural difficulties even when they are as young as three to five years of age. These findings highlight the fact that preschool children's social and emotional development and problems are closely linked to the family situation. The small group

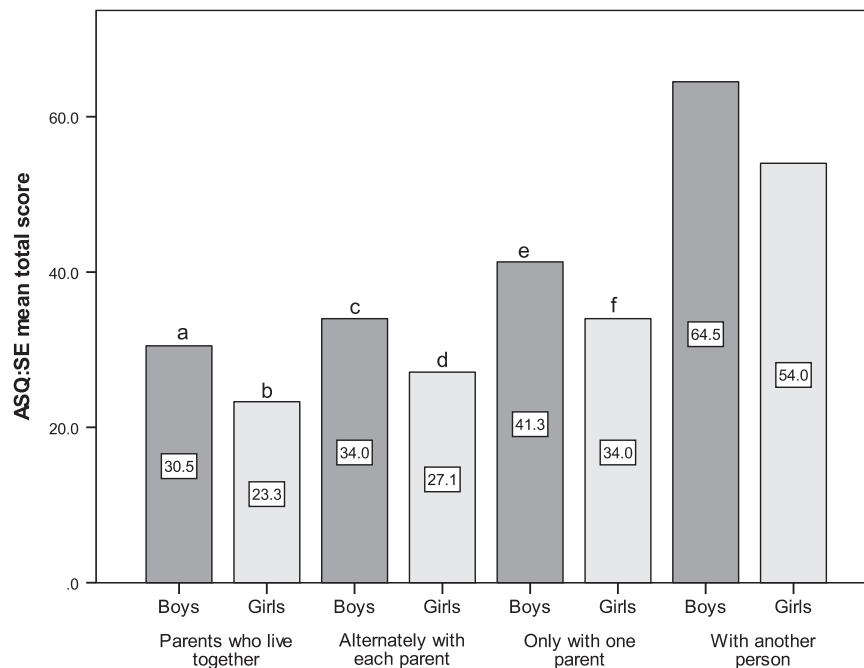


Figure 2 Distribution of Ages and Stages Questionnaires: Social-Emotional (ASQ:SE) mean total scores for boys ($n = 3642$) and girls ($n = 3404$) stratified by custody arrangement. p -value for overall difference (Welch test) between groups a–f was <0.001 . Significant *Post hoc* differences (Dunnett's T3) were found between ab, ae, bc, be, bf and de. The group who is living with another person was excluded from statistical comparisons due to a small sample size.

comprising children living with a person other than a parent had the highest levels of reported social-emotional problems. We assume that these children live in foster care, but the sample was too small to draw any concrete conclusions. However, the results are consistent with previous studies indicating that children living in foster care are vulnerable and at risk with regard to poorer health. When stratifying for different custody arrangements, problems were reported to a higher extent for children in rural areas compared to urban areas in the category of parents not living together. However, this was only significant with regard to parents of girls living alternately with each parent. The nonsignificant results found in the category of children living exclusively with one parent could be explained by the small sample size, as the disparity observed between urban and rural areas was notably greater in this category than in the group with parents living together. However, to our knowledge, there is a shortage of literature regarding disparities in prevalence of social-emotional problems in preschoolers that takes into account residence in rural or urban areas.

Parental concern for children

The most common area of parental concern related to the items addressing the child's success or ability to cope with eating situations. Such concern is well documented, both from clinical environments and scientifically, with further data specific to the Swedish context being obtained through the ASQ:SE. This concern can easily be sustained or increase over time as negative patterns of challenging

eating behaviours. Food neo-phobia and so-called picky/fussy eating are for example negatively reinforced through parental concerns and strategies such as control and pressure in eating situations and tend to exacerbate these eating behaviour problems (20). It is notable that parental concern was not necessarily most prevalent for children with the highest ASQ:SE total score. Further analysis is needed to identify the items that appear to contribute to high ASQ:SE total scores, thus implying social-emotional problems.

Implications for policy and clinical practice

This study calls for increased awareness in Swedish CHC concerning social-emotional problems among three-year-olds. In order to obtain a deeper understanding of such problems, the prevalence and breakdown of differences or similarities between girls and boys need to be monitored. Gender disparities and other factors, both on the individual and family level, need to be taken into account. It is important that this increased knowledge on social-emotional problems can contribute to measurable long-term improvements in equality and diversity within social sectors working for the promotion of children's health and well-being. This study will benefit those active in the area and can contribute to the further development of research on the mental health of preschool children. This is imperative for developing evidence-based interventions and the promotion of health and prevention of mental health problems and disorders at an early stage. Our hope is that the findings of this study will inform the development of CHC. The

Table 3 Ages and Stages Questionnaires: Social-Emotional (ASQ:SE)[†] mean total score and standard deviation (SD) for boys and girls, respectively, in relation to place of residence (urban/rural) when stratifying for different custody arrangements

All forms of custody arrangement	Parents who live together		Alternately with each parent		Exclusively with one parent	
	Boys	Girls	Boys	Girls	Boys	Girls
Urban	n = 2261	n = 2146	n = 2025	n = 1955	n = 77	n = 52
Mean (SD)	31.1 (25.4)	23.3 (20.7)	30.6 (25.2)	22.9 (20.4)	38.8 (31.8)	30.9 (23.1)
Rural	n = 1044	n = 924	n = 928	n = 833	n = 42	n = 26
Mean (SD)	31.3 (25.2)	24.0 (22.2)	30.0 (23.9)	23.6 (21.0)	44.9 (32.5)	39.3 (25.3)
Difference [‡]	-0.2	-1.5	0.6	-0.7	-6.1	-8.4
p-value*	0.808	0.079	0.591	0.374	0.324	0.143

[†]The Ages and Stages Questionnaires: Social-Emotional version 1.5 for three-year-olds.
[‡]Difference between mean ASQ:SE values in urban and rural areas.
^{*}p-value from independent samples *t* test.

Table 4 The Ages and Stages Questionnaires: Social-Emotional (ASQ:SE)* items that parents most often indicated as a concern for boys and girls

Item (no.)	All n (%)	Boys n (%)	Girls n (%)
Does your child have any eating problems? e.g. stuffing food, vomiting, eating things that are not meant to be eaten or.....? (15)	192 (2.7)	115 (3.1)	77 (2.2)
Do you and your child have pleasant meals together? (14)	122 (1.7)	78 (2.1)	44 (1.3)
Does your child cry, scream or have fits of rage that are prolonged? (19)	120 (1.7)	66 (1.8)	54 (1.6)
Does your child try to hurt other children, adults or animals (e.g. by kicking or biting)? (29)	118 (1.6)	85 (2.3)	33 (1.0)
Does your child calm down within 15 minutes when upset? (5)	103 (1.4)	58 (1.6)	45 (1.3)
Does your child hurt her/himself on purpose? (22)	87 (1.2)	44 (1.2)	43 (1.2)

*The Ages and Stages Questionnaires: Social-Emotional version 1.5 for three-year-olds.

scientific community has a need for such knowledge and evidence-based practice is required within several sectors of society, in CHC as well as in preschools. It is recommended that standardised general programmes to promote psychological health, prevent problems and influence the effect of different social determinants be implemented by community-based organisations (21), such as CHC, whose activities encompass almost all Swedish children. Furthermore, we recommend the continued development of ASQ:SE as a tool for detecting problems and for screening. Given that it does not fulfil all the requirements of screening (22), we cannot be sure of identifying individuals at sufficient risk that would benefit from further examination. The research results are aimed at researchers and community stakeholders that may want to use the ASQ:SE to develop an understanding of aspects of preschool children’s mental health. However, an additional study carried out by our research team will try to identify a clinically meaningful threshold when screening for mental health problems among three-year-olds and attempt to validate the ASQ:SE in a Swedish context. Further analysis is needed to identify which items are prevalent with regard to very low or very high scores concerning social-emotional problems. Knowledge on the patterns of children’s mental health in a Nordic context can also contribute to on-going intervention research by others parties (5), where the focus is on being able to predict, prevent and treat mental health problems at an early age.

Strengths and limitations

The results are derived from a comprehensive population-based study with high participation rates. Out of several questionnaires (23,24) ASQ:SE fulfilled the criteria of systematic identification of children’s developmental and

behavioural problems (25,26) with adequate psychometric properties. In addition, support for the use of ASQ:SE was established through the positive experience of CHC staff and parents when using the ASQ:SE as a tool in dialogue. Parents' own expectations and problems may also reflect how they report their child's problem. It is well-established that the well-being of parents directly impacts the well-being of their child (27,28). For example, mothers with high levels of stress and/or depression have been shown to score higher on the ASQ:SE (29). On the other hand, parents are the ones who usually understand and can best describe the child, and are therefore the most preferable proxy informants. A weakness of using the ASQ:SE is that it has only been validated based on American conditions and the current cut-off value derives from these surveys. However, future studies may contribute to increased knowledge regarding the validity of the ASQ:SE and how it can be further used in a Swedish context. For this study, the Swedish and English versions of ASQ:SE were used, which likely contributes to both a lower response rate and a lower expected proportion of immigrants. As regards representativeness, the sample had a somewhat higher proportion of children with parents living together (92%) compared to three-year-olds in Sweden as a whole (85%), according to data from Statistics Sweden.

Diverse family conditions, such as custody arrangements and place of residence, are taken into account in this study. This is considered a strength as children's mental health is significantly dependent on and linked to the environment in which they live. The American Academy of Pediatrics recommends that data on ethnicity and socio-economic status should be collected in research on child health (30); however, we did not have access to this information in the study. We also lack information on the characteristics of the neighbourhood's physical environment as we could only ascertain whether the place of residence was an urban or rural area based on the number of inhabitants. These important aspects of children's mental well-being need to be taken into account in future studies.

CONCLUSION

This study has increased our understanding of the mental health of Swedish three-year-olds in terms of social-emotional problems. It reinforces the importance of identifying social-emotional problems at an early age and taking gender differences and custody arrangements into account. Thus, as early as preschool age, social-emotional problems should be the subject of focus, preferably within the context of a systematic strategy by Child Health Care.

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CONFLICT OF INTEREST

None declared.

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References

1. Fryers T, Brugha T. Childhood determinants of adult psychiatric disorder. *Clin Pract Epidemiol Ment Health* 2013; 9: 1–50.
2. Carter AS, Briggs-Gowan MJ, Davis NO. Assessment of young children's social-emotional development and psychopathology: recent advances and recommendations for practice. *J Child Psychol Psychiatry* 2004; 45: 109–34.
3. Due P, Damsgaard MT, Madsen KR, Nielsen L, Rayce SB, Holstein BE. Increasing prevalence of emotional symptoms in higher socioeconomic strata: trend study among Danish schoolchildren 1991–2014. *Scand J Public Health* 2018. <https://doi.org/10.1177/1403494817752520>
4. Petersen S, Bergström E, Cederblad M, Ivarsson A, Köhler L, Rydell A-M, et al. Barns och ungdomars psykiska hälsa i Sverige. En systematisk litteraturoversikt med tonvikt på förändringar över tid [Child and adolescent mental health in Sweden. A systematic review focusing on changes over time] (in Swedish). Stockholm: Health Committee, Royal Swedish Academy of Sciences, 2010: 1–89.
5. Kato N, Yanagawa T, Fujiwara T, Morawska A. Prevalence of children's mental health problems and the effectiveness of population-level family interventions. *J Epidemiol* 2015; 25: 507–16.
6. Briggs RD, Stettler EM, Silver EJ, Schrag RDA, Nayak M, Chinitz S, et al. Social-emotional screening for infants and toddlers in primary care. *Pediatrics* 2012; 129: e377–84.
7. Skovgaard AM. Mental health problems and psychopathology in infancy and early childhood. An epidemiological study. *Dan Med Bull* 2010; 57: B4193.
8. Bergstrom M, Fransson E, Fabian H, Hjern A, Sarkadi A, Salari R. Preschool children living in joint physical custody arrangements show less psychological symptoms than those living mostly or only with one parent. *Acta Paediatr* 2018; 107: 294–300.
9. Haggstrom J, Sampaio F, Eurenius E, Pulkki-Brannstrom AM, Ivarsson A, Lindkvist M, et al. Is the Salut Programme an effective and cost-effective universal health promotion intervention for parents and their children? A register-based retrospective observational study. *BMJ Open* 2017; 7: e016732.
10. Squires J, Bricker D, Twombly E. *Ages & stages questionnaires: social-emotional. A parent-completed, child-monitoring system for social emotional behaviors*. Baltimore: Brookes Publishing Co, 2002.

11. Squires J, Bricker D, Heo K, Twombly E. Identification of social-emotional problems in young children using a parent-completed screening measure. *Early Child Res Q* 2001; 16: 405–19.
12. Acquadro C, Mapi Research Institute. *Linguistic validation manual for patient-reported outcomes (PRO) instruments*. Lyon, France: MAPI Research Trust, 2004.
13. Cohen J. *Statistical power analysis for the behavioral sciences*. 2nd ed. Hillsdale, NJ: Lawrence Erlbaum Associates, 1988.
14. Wichstrom L, Berg-Nielsen TS, Angold A, Egger HL, Solheim E, Sveen TH. Prevalence of psychiatric disorders in preschoolers. *J Child Psychol Psychiatry* 2012; 53: 695–705.
15. Obel C, Heiervang E, Rodriguez A, Heyerdahl S, Smedje H, Sourander A, et al. The strengths and difficulties questionnaire in the Nordic countries. *Eur Child Adolesc Psychiatry* 2004; 13 (Suppl 2): II32–9.
16. Gustafsson BM, Proczkowska-Bjorklund M, Gustafsson PA. Emotional and behavioural problems in Swedish preschool children rated by preschool teachers with the Strengths and Difficulties Questionnaire (SDQ). *BMC Pediatr* 2017; 17: 110.
17. D'Souza S, Waldie K, Peterson E, Underwood L, Morton S. Psychometric properties and normative data for the preschool Strengths and Difficulties Questionnaire in two-year-old children. *J Abnorm Child Psychol* 2017; 45: 345–57.
18. Mieloo C, Raat H, van Oort F, Bevaart F, Vogel I, Donker M, et al. Validity and reliability of the strengths and difficulties questionnaire in 5-6 year olds: differences by gender or by parental education? *PLoS One* 2012; 7: e36805.
19. Kelly Y, Sacker A, Del Bono E, Francesconi M, Marmot M. What role for the home learning environment and parenting in reducing the socioeconomic gradient in child development? Findings from the millennium cohort study. *Arch Dis Child* 2011; 96: 832–7.
20. Wardle J, Carnell S, Cooke L. Parental control over feeding and children's fruit and vegetable intake: how are they related? *J Am Diet Assoc* 2005; 105: 227–32.
21. Marmot M, Friel S, Bell R, Houweling TA, Taylor S, Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health. *Lancet* 2008; 372: 1661–9.
22. Elliman DA, Dezateux C, Bedford HE. Newborn and childhood screening programmes: criteria, evidence, and current policy. *Arch Dis Child* 2002; 87: 6–9.
23. Szanieck E, Barnes J. Measurement issues: measures of infant mental health. *Child Adolesc Mental Health* 2016; 21: 64–74.
24. Theunissen MH, Vogels AG, de Wolff MS, Crone MR, Reijneveld SA. Comparing three short questionnaires to detect psychosocial problems among 3 to 4-year olds. *BMC Pediatr* 2015; 15: 84.
25. Bagner DM, Rodríguez GM, Blake CA, Linares D, Carter AS. Assessment of behavioral and emotional problems in infancy: a systematic review. *Clin Child Fam Psychol Rev* 2012; 15: 113–28.
26. Kettler RJ, Feeney-Kettler KA. Screening systems and decision making at the preschool level: application of a comprehensive validity framework. *Psychol Sch* 2011; 48: 430–41.
27. Aldridge J. The experiences of children living with and caring for parents with mental illness. *Child Abuse Rev* 2006; 15: 79–88.
28. Hinshaw SP. The stigmatization of mental illness in children and parents: developmental issues, family concerns, and research needs. *J Child Psychol Psychiatry* 2005; 46: 714–34.
29. Salomonsson B, Slead M. The Ages & Stages Questionnaire: social-Emotional: a validation study of a mother-report questionnaire on a clinical mother-infant sample. *Infant Ment Health J* 2010; 31: 412–31.
30. Cheng TL, Goodman E, Committee oPR. Race, ethnicity, and socioeconomic status in research on child health. *Pediatrics* 2015; 135: e225–37.