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Childcare context and socio-emotional development in toddlers – a quantitative report from the FinnBrain Birth Cohort Study, Finland

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ABSTRACT

Toddlerhood is a period of intensive and rapid socio-emotional development. The effects of different types of childcare settings on child development have been widely studied, but the results have often been contradictory. The aim of this study was to compare social competence and socio-emotional problems in two-year-old children ($n = 1104$; girls 47.2%) who were either participating in out-of-home, center-based childcare or were cared for at home by their parents in Finland. The results showed that mothers reported more internalizing symptoms in toddlers participating in out-of-home, center-based childcare when compared to children who were cared for at home. No differences regarding externalizing symptoms or social competence were found. Overall, the results suggest that out-of-home, center-based childcare is not associated with major differences in a toddler's socio-emotional development. More research is needed to investigate whether differences in the socio-emotional development of the children participating in different types of childcare develop later in childhood.

KEYWORDS

Toddlerhood; early childhood education and care (ECEC); social competence; internalizing symptoms; externalizing symptoms

Introduction

Toddlerhood is an important period for social and emotional development. It is a period of increasing autonomy, emerging self-awareness, and the development of emotional and

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behavioral regulation (Brownell and Kopp 2007). Socio-emotional development is a broad concept involving social, emotional, and cognitive domains (Campbell et al. 2016). Further, these aspects of psychological development are connected to and influenced by each other (Perez and Gauvain 2007). Problems in socio-emotional development may be associated with adverse outcomes in many areas of life, such as lower learning achievements or problems in peer relations throughout childhood (Huber, Plötner, and Schmitz 2019). Socio-emotional development is, to some extent, genetically determined, but also largely dependent on the environment (Denham et al. 2009). The environment influences child development through the cultural context (Chen and Rubin 2011), attachment relationships (Zeegers et al. 2017), resources and stressors affecting the family (Watkins, Pittman, and Walsh 2013), and through peer relations (Rubin, Begle, and McDonald 2012).

Social competence can be defined as the ability to make use of both personal and environmental resources in order to achieve desirable outcomes in social situations (Waters and Sroufe 1983). Social competence is linked with various outcomes in different spheres of life. Typically, a socially competent child is popular and capable of establishing and maintaining positive relations with peers, has self-confidence, and the ability to collaborate with others (Denham et al. 2009). Socio-emotional development has often been measured as the presence or absence of problems in social and emotional domains, such as in the interaction with others. Externalizing problems refer to aggressive and externally directed behaviors, such as physical violence and destructive behavior (Achenbach and Edelbrock 1978). In a two-year-old child, examples of externalizing problems might include an increased expression of negative emotionality within their interactions, noncompliance, poor impulse control, and aggression toward peers (Campbell, Shaw, and Gilliom 2000; Martin, Clements, and Crnic 2011). However, that kind of behavior may also be normal for children at that age and disappear along with the development. Internalizing symptoms, in turn, include more inwardly directed symptoms such as anxiety, withdrawal, and extreme shyness (Achenbach and Edelbrock 1978). In a two-year-old, internalizing symptoms may be displayed as a lack of responsiveness and positive emotions within their interactions with others (Martin, Clements, and Crnic 2011). However, separating socio-emotional symptoms into clearly defined categories is ultimately challenging among young toddlers, because symptoms tend to be less specific in early childhood than in later life (Campbell 2006).

Childcare context and socio-emotional development

In addition to the child's home environment, out-of-home, center-based childcare setting is another central source of influence with regard to child development. In out-of-home, center-based childcare, frequent interactions with peers and non-parental caregivers can support the development of children's social skills (Campbell et al. 2016). On the other hand, a poor quality of care, excessively large group sizes, and insufficient attention from caregivers may contribute to negative social and emotional outcomes for children (Huston, Bobbitt, and Bentley 2015). The quality of the interaction between caregivers and children plays an important role in shaping child socio-emotional development, and this principle applies to out-of-home, center-based childcare as well as the home environment (Burchinal et al. 2010; Morris et al. 2007).

Previous research concerning the influence of the childcare setting on child socio-emotional development has provided mixed and often contradicting results. Some studies have found positive associations between out-of-home, center-based childcare attendance and child social skills and peer relations, in particular, when the childcare quality is high and caregivers show responsiveness and sensitivity towards children (Blewitt et al. 2018; Sylva et al. 2011). There is also research suggesting less internalizing symptoms and less social withdrawal and shyness in children who had participated in out-of-home, center-based childcare when compared to those children who had a less out-of-home childcare experience or parental home care only (Pingault et al. 2015). On the other hand, some research indicates that the more time children spent in out-of-home center-based childcare, the more externalizing symptoms they displayed (Belsky 2007; NICHD 2003). However, there is also opposite findings showing no behavior problems in children who have participated in out-of-home, center-based childcare (Barnes et al. 2010; Rey-Guerra et al. 2023). Moreover, earlier studies conducted in Nordic countries did not report more externalizing problems in children participating in out-of-home, center-based childcare when compared to other childcare settings (Prodromidis et al. 1995; Solheim et al. 2013; Zachrisson et al. 2013).

Hence, earlier results on the topic are contradictory and highly dependent on the childcare context and the child's age. There are large differences in educational systems among countries, i.e. the age at which children start in Early Childhood Education and Care (ECEC), and the daily hours children spend in out-of-home, center-based childcare varies among different countries. Also, the lengths of parental leaves and the fees of out-of-home, center-based childcare attendance differ considerably across countries (OECD 2020). Thus, the results should be viewed against a specific childcare context and its features.

This study was conducted in Finland, where the childcare system is rather similar as in other Nordic countries. Finnish legislation guarantees all children under six years of age the right to full-time ECEC regardless of the employment status of their parents. ECEC in Finland is based mainly on public provision making the quality of formal childcare rather homogenous in comparison with countries, such as the US and UK, where the private sector plays a more central role in the ECEC provision (Kulic et al. 2017). Finnish law defines limits for group sizes, staff-to-child ratios, and education level of the caregivers in childcare centers (Minedu 2017). Concerning socio-emotional development, the aim of the Finnish ECEC is to support the development of the children's interaction, self-expression, and cooperation skills. Furthermore, the National Core Curriculum delineates that children must be given sufficient opportunity to develop their emotion-related skills (Minedu 2017).

Instead of focusing solely on one kind of environment, it is important for the developmental and the educational research to examine different caregiving settings. Furthermore, as social and emotional development is a multifaceted construct, the focus of research should be both on child socio-emotional problems and competencies. There is a notable lack of the research comparing both socio-emotional problems and social competence in toddlers in different childcare contexts. This study aims at addressing this gap by investigating 2-year-old toddlers both in out-of-home, center-based childcare and in home-care settings.

The specific aim of this study was to assess the social competence and socio-emotional problems of two-year-old children who participated either in out-of-home, center-based childcare or were cared for at home by their parents. The research questions for this study were: (a) are there differences in the levels of socio-emotional competence between two-year-old children in out-of-home, center-based childcare versus home care? and (b) are there differences in internalizing and externalizing problems between two-year-old children in out-of-home, center-based childcare versus home care?

More research is needed to examine child development in different childcare systems. The Nordic model emphasizes universal access to education and social support and health services. ECEC is an important part of the family policy and also part of the education that focuses on improving child learning and competences (Karila 2012). Based on earlier research conducted in Nordic countries and based on the particular aims of the Finnish ECEC (Minedu 2017), we hypothesized that out-of-home, center-based childcare attendance would be associated with higher child social competence when compared to home care. However, no differences between the groups in externalizing or internalizing problems were expected (Prodromidis et al. 1995; Solheim et al. 2013; Zachrisson et al. 2013).

Method

Participants

The participants of this study were drawn from the larger FinnBrain Birth Cohort Study ($n = 3808$), which is a longitudinal research project studying genetic and environmental influences on child development. The recruitment process for the FinnBrain Cohort took place between 2011 and 2015, and it involved research nurses approaching families at three maternal welfare clinics in the geographical area of Southwest Finland and the Åland Islands. Families were approached at gestational week 12, and the inclusion criteria for the study were sufficient knowledge of Finnish or Swedish and a normal ultrasound screening result (Karlsson et al. 2018).

According to the eligibility criteria of the current study, the participating children needed either to participate in out-of-home, center-based childcare or were to be cared for at home when they were two years old. The information concerning the childcare arrangement was obtained from the cohort research questionnaires and from the specific childcare substudy within the FinnBrain project at the child's age of two. Furthermore, only those children whose parent had filled in the Brief Infant-Toddler Social and Emotional Assessment (BITSEA) (Briggs-Gowan et al. 2004) questionnaire at the child's age of two were included in the final sample. The application of these criteria produced a final sample ($n = 1104$), which is balanced in terms of the size of the two childcare groups: 555 children were participating in out-of-home, center-based childcare and 549 were cared for at home.

For those participants who were in home care, the main caregiver was most often the child's mother (80.7%) or father (6.6%), and, in some cases, a relative (4.7%) or 'other' (0.9%). For 39 (7.1%) of the participants, the information concerning the main caregiver in the home care was missing. The flowchart of the recruiting process is illustrated in Figure 1.

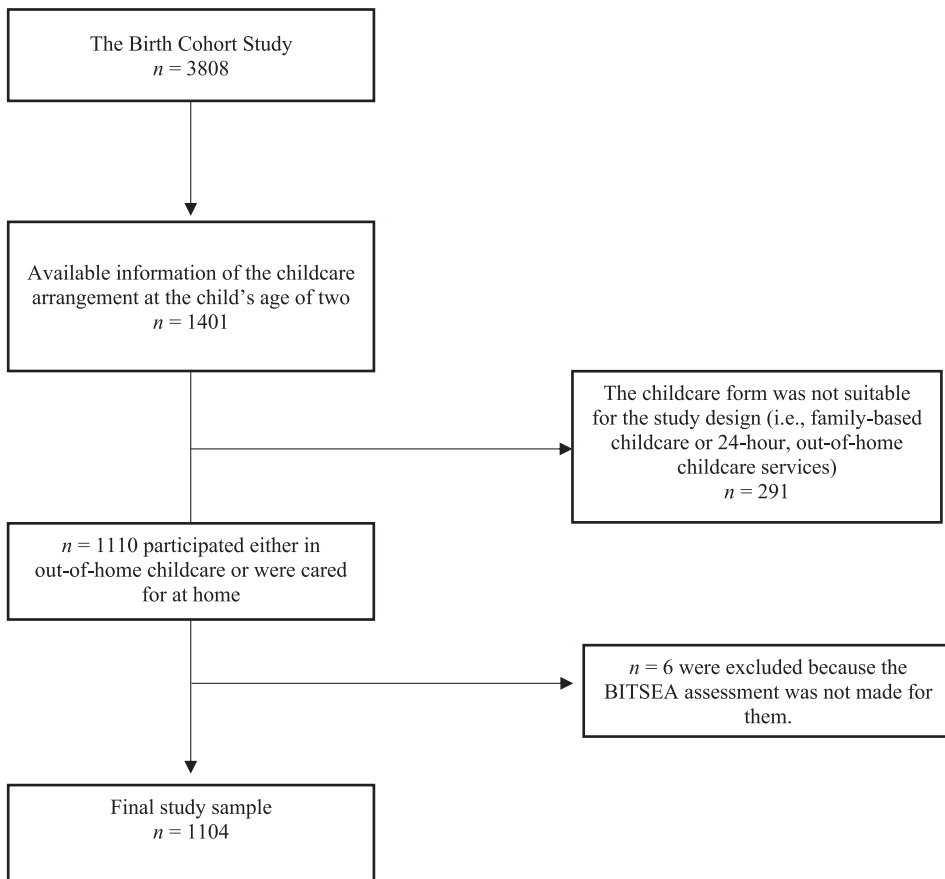


Figure 1. Flowchart illustrating the sample selection process.

Procedure

Background data on maternal education and income level and the information of maternal previous childbirths were collected from the cohort research questionnaires and the Medical Birth Register of the Finnish National Institute for Health and Welfare. Maternal symptoms of depression were assessed using the EPDS, Edinburgh Postnatal Depression Scale (Cox, Holden, and Sagovsky 1987) and anxiety symptoms by using SCL-90 symptom checklist (Derogatis, Lipman, and Covi 1973) self-report questionnaires at the child's age of two.

The research meets the ethical guidelines and have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. All the participants gave written informed consent, and parents gave consent on behalf of their child. The Ethics Committee of the Hospital District of Southwest Finland has approved the FinnBrain Birth Cohort Study with the protocol number 'ETMK: 137/1801/2013'. All the participants of the FinnBrain study have been given a personal ID code, and in the current study, their data have been handled by using this ID code only. The participants have the right to withdraw from the study at any time if they wish.

Measures

Child social and emotional development was evaluated at the age of two using a maternal report of the Brief Infant-Toddler Social and Emotional Assessment (BITSEA). The BITSEA is a 42-item questionnaire designed for the purpose of screening for developmental delays and problems and the social and emotional competence of 12- to 36-month-old children (Briggs-Gowan et al. 2004). It includes dimensions measuring internalizing and externalizing symptoms, dysregulation, and competence as well as items related to atypical, but rare, clinically significant problem behaviors. All BITSEA items are rated on a 3-point scale by choosing one of the following options: 0 = rarely/not true, 1 = somewhat true/sometimes, or 2 = often/true. Higher scores on each dimension indicate more problems or higher competence.

The aim of this study was to examine child competence and internalizing and externalizing symptoms, and therefore, the dysregulation scale and clinically significant problem behaviors were excluded in the current study. Internal consistency scores of the chosen factors in the present sample were as follows: Internalizing (Cronbach's $\alpha = 0.59$), Externalizing ($\alpha = 0.61$), and Competence ($\alpha = 0.60$).

Data analysis

All statistical analyzes were performed in R 4.0.5 (R Core Team 2022). In the preliminary analyzes, Spearman correlation, independent samples t-tests, and one-way ANOVA were used to examine whether the background variables were associated with children's scores on the BITSEA scales of internalizing and externalizing symptoms, or social competence. The background variables considered were child sex, whether the child's mother had given birth before (parity), maternal education, maternal income level, and maternal scores of depression and anxiety symptoms. Previous research has shown that maternal postnatal depression and anxiety symptoms may affect child social and emotional outcomes (Davis and Qi 2020; Goodman et al. 2011). Also, in the current study, the background variables of maternal depression and anxiety symptoms as well as maternal income level were associated with internalizing symptoms and were controlled for in the consequent models along with the maternal level of education. Furthermore, the association between BITSEA scales and the age at which the child first entered out-of-home, center-based childcare was examined for those children in the out-of-home, center-based childcare group.

After the preliminary analyzes, the BITSEA scores of toddlers who were participating in out-of-home, center-based childcare were compared to those who were cared for at home. As only the internalizing scale was associated with the childcare setting, a linear regression model was built using internalizing symptoms as the dependent variable and the childcare setting as an independent variable controlling for the covariates mentioned previously. As there were some missing values in the covariates (Table 1) in our data, the missing observations were imputed for model covariates using non-parametric random forest imputation (missForest package for R version 1.5) (Stekhoven 2015).

Table 1. Demographic characteristics of the participants.

	Out-of-home childcare	Home care	Total sample	<i>p</i> -value
Sample <i>N</i>	555	549	1104	
Child age (years), mean (SD)	2.05 (.06)	2.05 (.06)	2.05 (.06)	.463
Child sex (girls), <i>N</i> (%)	268 (48.3%)	253 (46.1%)	521 (47.2%)	.147
Age (months) when started in out-of-home childcare, median (interquartile range)	17.0 (14.0–21.0)	–	–	
<i>Maternal characteristics</i>				
Parity, multiparous, <i>N</i> (%)	265 (47.7%)	257 (46.8%)	522 (47.3%)	.756
Education <i>N</i> ¹ (%)				
High school/Vocational education	98 (18.5%)	197 (37.7%)	295 (28.0%)	<.001
Applied university	163 (29.1%)	154 (31.2%)	317 (30.2%)	
University degree	277 (52.4%)	162 (31.0%)	439 (41.8%)	
Monthly income level <i>N</i> ² (%)				
≤ 1500	139 (26.2%)	243 (46.7%)	382 (36.4%)	<.001
1501–2500	307 (57.9%)	232 (44.6%)	539 (51.3%)	
2501–3500	72 (13.6%)	40 (7.7%)	112 (10.7%)	
>3500	12 (2.3%)	5 (1.0%)	17 (1.6%)	
Depression/EPDS, mean (SD) ³	4.56 (4.21)	4.63 (4.31)	4.60 (4.26)	.807
Anxiety/SCL, mean (SD) ⁴	2.88 (3.78)	2.78 (3.94)	2.83 (3.86)	.659

Note. *P* values based on *t* test for age, and maternal depression and anxiety symptoms; and χ^2 test for gender, parity, and maternal education and income level.

¹Based on *N* = 529 for out-of-home childcare and *N* = 522 for home care.

²Based on *N* = 530 for out-of-home childcare and *N* = 520 for home care.

^{3–4}Based on *N* = 518 for out-of-home childcare and *N* = 524 for home care.

^{1–4}Missing values were imputed in the statistical analyzes.

Results

Descriptive statistics

The demographic characteristics of the participants are presented in Table 1. All the participants were ethnically Caucasian. The childcare groups were equal in size, and there were no differences in the mean age of the children or the proportion of boys and girls between the groups. There were also no differences between the groups in the parity or in the scores of the maternal depression or anxiety symptoms. However, there were differences between the groups in the maternal education and income levels: both were lower in the home-care group, although, it should be noted that the overall education level in the sample was rather high.

Associations between the childcare setting and child socio-emotional development

The results indicated that children in the out-of-home, center-based childcare group displayed a higher level of internalizing problems when compared to the home-care group. However, the effect size was rather small. There were no significant differences between the groups in externalizing symptoms or social competence. Means and standard deviations of both groups' BITSEA scores as well as *t*-scores and the corresponding *p*-values and effect sizes are displayed in Table 2. and in Figure 2.

After controlling for maternal income, maternal education, and the maternal depression and anxiety symptoms, the childcare setting was still significantly associated with toddlers' internalizing symptoms at the child's age of two. That is, being cared for in out-of-home, center-based childcare was associated with a higher maternal report of

Table 2. Means, standard deviations, t-values, and estimates of effect size for BITSEA scales for home care and out-of-home, childcare groups.

BITSEA scale	Childcare setting	Mean	SD	t	df	p	d
Externalizing	Home care	2.608	2.010	-.183	1099	.855	-.011
	Out-of-home childcare	2.630	1.964				
Internalizing	Home care	3.296	2.446	-2.17	1101	.030*	-.131
	Out-of-home childcare	3.620	2.518				
Competence	Home care	17.948	2.591	-1.23	1088	.244	-.070
	Out-of-home childcare	18.123	2.371				

* $p < .05$, ** $p < .01$, *** $p < .001$.

Note: d = Cohen's d , df = degrees of freedom, SD = standard deviation.

internalizing symptoms when compared to home care. The model explained the variance in the internalizing scores with an adjusted R^2 of .1041. Model parameters are presented in Table 3.

Discussion

The present study compared the mother-reported socio-emotional development of two-year-old children in two types of childcare: out-of-home, center-based childcare and home care. The aim was to investigate whether the childcare type was associated with differences in internalizing and externalizing symptoms, or social competence in two-year-old children. To our knowledge, this was among the first studies in the Nordic countries concerning toddlers' socio-emotional development both in home care and out-of-home, center-based childcare settings.

The results showed that mothers of children who participated in out-of-home, center-based childcare reported slightly more internalizing problems in their children when compared to children who were cared for at home. There were no differences in other

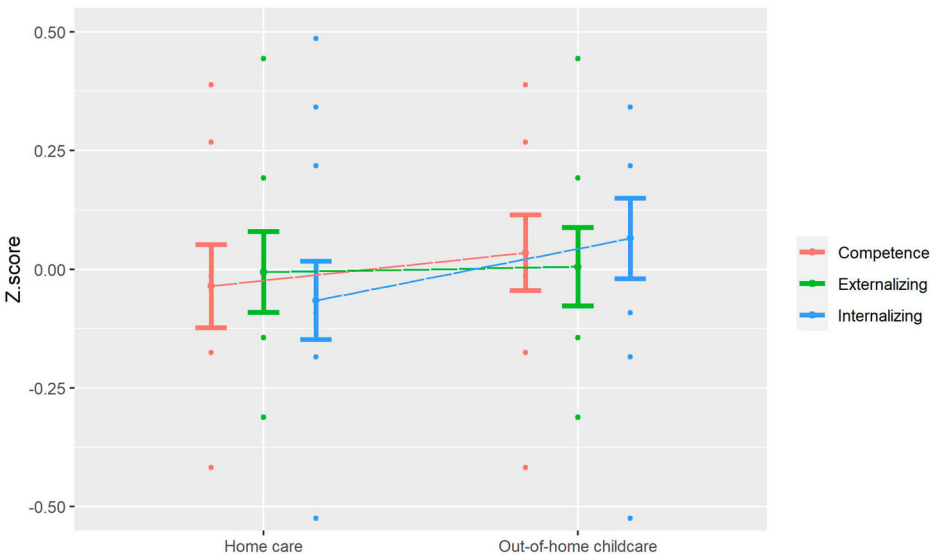


Figure 2. Standardized values of the Brief Infant Toddler Social and Emotional assessment (BITSEA) scales by childcare setting.

Table 3. General linear model of toddler internalizing symptoms: parameter estimates and corresponding variables.

Variable	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	95% <i>CI</i>		η^2
					<i>LL</i>	<i>UL</i>	
Intercept	2.921	.1752	16.67	< .001	2.577	3.265	.056
Out-of-home childcare	0.3614	0.1483	2.437	.015	0.070	0.6525	.005
Home care	–	–	–	–	–	–	–
Maternal income: 1501–2500	–0.06	0.1662	–0.3609	.7183	–0.3861	0.2662	.000
Maternal income: 2501–3500	–0.1638	0.2647	–0.6187	.5363	–0.6832	0.3557	.000
Maternal income: > 3500	0.0996	0.5655	0.1763	.8601	–1.0098	1.2091	.000
Maternal income: ≤ 1500	–	–	–	–	–	–	–
Maternal education: Applied university	–0.4313	0.1964	–2.196	.0283	–0.8166	0.04593	.005
Maternal education: University degree	–0.2779	0.1944	–1.429	.1532	–0.6593	0.1036	.005
High school/Vocational education	–	–	–	–	–	–	–
Maternal Anxiety symptoms (SCL)	0.185	0.02515	7.355	<.001	0.1356	0.2343	.050
Maternal Depression symptoms (EPDS)	0.02881	0.2282	1.262	.2071	–0.0160	0.0736	.001

Note: *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit. Baseline childcare setting was home care. Baseline maternal education level was High school/Vocational education. Baseline maternal income level was <= 1500 € per month.

socio-emotional scales, such as externalizing symptoms or social competence between the two childcare groups. Even though out-of-home, center-based childcare attendance was associated with toddlers' internalizing symptoms in the present study, the effect size was rather small. The results highlight only the small differences across the childcare settings in terms of a toddler's socio-emotional development in the Nordic context of childcare.

In the current study, the children had started in out-of-home, center-based childcare when they were on average 17 months old. That is, most children at 2 years had recently started adjusting to non-parental, out-of-home center-based childcare during the assessment. According to previous research, both physiological (Ahnert et al. 2004; Bernard et al. 2015) and behavioral changes (Fein, Gariboldi, and Boni 1993) are typical when toddlers enter out-of-home, center-based childcare for the first time. Fein, Gariboldi, and Boni (1993) found that toddlers became more inhibited and displayed a more negative affect upon entering childcare, presumably as they adjusted to the unavailability of their parents and to the increasing numbers of peers surrounding them. However, as the time spent in out-of-home, center-based childcare increased, the toddlers began to show a more positive affect and a less negative affect and became increasingly active, cooperative, and sociable (Datler et al. 2012; Fein, Gariboldi, and Boni 1993). In light of these prior research, it seems possible that the higher levels of internalizing problems exhibited by children in out-of-home, center-based childcare could be caused by their ongoing adjustment to non-parental, out-of-home center-based childcare. If future research confirms that heightened internalizing problems would be caused by children's ongoing adjustment to out-of-home, center-based childcare, different arrangements could be implemented to facilitate this transition.

Internalizing symptoms may also reflect children's insecurity in their attachment behavior which may be caused by separation from their attachment figures. Beginning in out-of-home childcare may temporarily evoke a feeling of insecurity and is a normal reaction when a child is separated from parents for the first time. Also, earlier findings indicate that secure relationship with caregivers and emotional support in

childcare promote child stress regulation in out-of-home, non-parental care (Badanes, Dmitrieva, and Watamura 2012; Hatfield et al. 2013). That is, caregivers in childcare centers could be trained to increase children's feelings of security and reduce their internalizing symptoms through emotional availability and a sensitive interaction (Harkoma et al. 2021). In addition, children could be placed in smaller groups, or they could start in family-based or part-time care when first entering out-of-home childcare. Moreover, it is important to gain more information on a possible variance in later development, and whether there is a group of children in whom this early sign of possible stress is predictive of later health.

In contrast to our hypothesis, there was no difference in social competence between the two groups of children. This is in line with an earlier study by Bleiker, Gampe, and Daum (2019) suggesting that childcare type was not associated with a child's cognitive, motor, social, or language skills. Nonetheless, earlier findings also indicate that children who attended out-of-home center-based childcare engaged in more mature social and emotional competence and advanced play with their peers especially when the quality of care was high (Blewitt et al. 2018; Sylva et al. 2011). Considering the fact that in the current study the toddlers had participated in out-of-home, center-based childcare a rather short time, it could be that the potential differences in social competence had not had sufficient time to develop. Longitudinal research could detect a potential effect of different childcare settings on social competence in children.

To our knowledge, there is no previous research that has found more internalizing symptoms in children participating in out-of-home, center-based childcare. Instead, some of the earlier studies have reported less internalizing symptoms, less social withdrawal, and less shyness in children with more center-based, out-of-home childcare experiences (Bates et al. 1994; Pingault et al. 2015). However, these studies have examined the same children for a longer period during their childhood years. Our results are limited to the toddler period, and the long-term effects cannot yet be determined. It also remains unclear what kinds of influences the small difference in internalizing symptoms would have on child development or later well-being. More longitudinal research is needed to confirm these findings and also to examine whether differences in socio-emotional development persist in later childhood when the children have spent more time in different types of childcare.

In this study, no differences in externalizing symptoms between two-year-old children in out-of-home center-based childcare and in home care were found. This is in line with earlier studies conducted in Nordic countries suggesting that out-of-home, center-based childcare attendance is not related to children's aggressive behavior or other externalizing problems in comparison with other forms of childcare (Prodromidis et al. 1995; Solheim et al. 2013; Zachrisson et al. 2013). Nevertheless, these findings contradict with the large-scale American studies that have reported more conflicts and externalizing behavior problems in children participating in out-of-home, center-based childcare when compared to children with parental home care experience only (Huston, Bobbitt, and Bentley 2015; NICHD 2003). These mixed results may derive from the different childcare systems in different countries. The results should, thus, be viewed against the current ECEC context and early education policies. There are large differences in the out-of-home childcare and parental leave systems among countries. In Finland and in the other Nordic countries, the universal access to out-of-home childcare, relative

affordability, and a high level of organization are qualities characterizing the childcare system (OECD 2020). Reaching a better understanding of this issue is necessary for our ability to provide children with environments that best support their development. It is well known that detecting and treating psychosocial problems as early as possible can result in significant and enduring reductions in symptoms as well as a better understanding of risks and protective factors (Kjeldsen et al. 2021). Improving our understanding of the behavioral and psychosocial correlates of different types of childcare could help parents, professionals, and politicians make informed decisions regarding childcare.

This study has several strengths such as its large sample size and comprehensive background information of the participants. However, there are also limitations that should be noted. First, the internal consistency of the BITSEA scales were not very high. The Cronbach's alphas for Externalizing and Competence scales were moderate (0.60–0.70), and for Internalizing low (<0.60). However, this is in line with other research conducted in Finnish general population (Alakortes et al. 2015; Kovaniemi et al. 2018).

Second, the research design was cross-sectional, and the causal inferences cannot be drawn based on the results. Therefore, it is not possible to directly infer whether out-of-home, center-based childcare increases internalizing problems among toddlers. Furthermore, a questionnaire filled in by the mothers was the sole source of information in the present study. It has been shown that there are often discrepancies between parental and teacher reports concerning child behavior (Achenbach 2011). The use of multiple informants when assessing socio-emotional development is recommended, as child behavior tends to be context specific (Denham et al. 2009). Moreover, it would be appropriate to include additional sources of information, such as child observation, when studying child development and its relation to childcare type.

Third, although several background variables were examined in the present study, there are many factors that were not included, such as group sizes, staff-to-child ratios, and the quality of caregiver-child and peer interactions in out-of-home, center-based childcare. All of these factors could potentially moderate the effects of childcare on child socio-emotional development. Previous research has consistently found different measures of childcare quality to be associated with various developmental outcomes in children (Miner and Clarke-Stewart 2008). Future research could also measure child temperament and attachment in order to clarify whether the effects of childcare type on child socio-emotional development depend on these individual characteristics.

Conclusion

The results of the current study suggest that, in the context of Nordic childcare, there are no significant differences in socio-emotional development between two-year-old toddlers who are in home care versus out-of-home, center-based childcare. However, mother-reported internalizing problems were higher among toddlers participating in out-of-home, center-based childcare when compared to toddlers who were cared for at home even after controlling for several confounders. It is possible that this finding reflects an adjustment process that children go through when entering out-of-home, center-based childcare for the first time. However, it is also important to consider whether there is a group of children for whom these internalizing symptoms are signs of stress and may have consequences for later development and health. More longitudinal research

is needed to clarify whether early childcare arrangements and the factors related to child transition to childcare have any influence on child development or later well-being.

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Data availability statement

The datasets generated for this study will not be made publicly available because restrictions imposed by the Finnish law and the study's ethical permissions do not allow sharing of the data used in this study. Requests to access the datasets should be directed to the Principal Investigator of the FinnBrain Birth Cohort Study.

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