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ORIGINAL PAPER

Cumulative effects of negative life events and family stress on children's mental health: the Bergen Child Study

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Abstract
Purpose Numerous studies have documented that lower socioeconomic status (SES) is associated with increased mental health problems in children. One proposed pathway for this association has been differential exposure to accumulated risk factors in children of lower SES. The aim of the current study was to investigate the socioeconomic distribution of exposure to negative life events and family stress and to examine the direct and interactive association between lower SES and exposure to life events and family stress in relation with mental health problems.
Methods Using cross-sectional data from the second wave of the Bergen Child Study (conducted in 2006), the current study investigated the association between lower SES and exposure to negative life events, family life stressors, and mental health problems in a sample of 2043 Norwegian 11–13 years and their parents. Information about mental health was self-reported by the children using the Strengths and Difficulties Questionnaire, whereas information about SES and exposure to negative life events and family stressors were provided by their parents.
Results The findings showed that lower SES was associated with more symptoms of emotional-, conduct-, hyperactivity/inattention-, and peer problems and that exposure to life events and family stress explained some of this association (10–29% of the total effects).
Conclusions Low SES and higher prevalence of negative life events and family stressors were associated with more symptoms of mental health problems. Overall, the effect sizes were smaller than previous investigations (f^2s = 0.015–0.031), perhaps suggesting a buffering effect of the social safety net in place in Norway.

Keywords SES · Mental health · Cumulative stress · Bergen Child Study

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Introduction

Children who grow up in families with low socioeconomic status (SES) are at increased risk for negative developmental outcomes, including worsening physical, emotional, and psychosocial developments [1–3]. For example, among adolescents, socioeconomic disadvantage has been shown to be associated with higher risks for both depression and behavioral problems [4, 5].

Low SES appears to influence children's mental health primarily indirectly through the adverse effects it has on their physical and psychosocial surroundings [6]. One

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pathway of influence is through parental stress, parenting practices, and interpersonal dynamics in the family [7–9], and a second pathway is through accumulation of environmental risk factors [10], the main area of investigation in the current study.

Family poverty and the stressors associated with both physical hardship (e.g., overcrowding) as well as psychosocial stressors (e.g., financial insecurity) are likely to increase parental stress and compound the effects of daily hassles or more serious life events [10]. Furthermore, parents from low SES households are more vulnerable to uncontrollable life events, due to lack of financial and social resources and coping skills to manage situations such as loss of employment [10–12].

There is growing evidence demonstrating the robust association between cumulative risk exposure in childhood and adverse psychological, behavioral, and physical health outcomes [13, 14]. The cumulative stress perspective suggests that children in disadvantaged families are exposed to more chaos, unpredictability and instability compared to their more affluent peers and that exposure to several adverse psychosocial stressors is associated with worse outcomes than a single exposure [15, 16]. For example, Atkinson and colleagues examined cumulative risk exposure (including low SES) in a Canadian sample of 284 children aged 5–6 years at baseline [13]. Cumulative risk exposure in childhood was associated with future mental and physical health outcomes, including depression and having a chronic illness at age 25 or 26. Another study by Evans and colleagues [17] examined the long-term impact of economic disadvantage on future mental health in a small cohort of children ($n = 196$) in the United States. They found that the children exposed to poverty during early childhood (from birth to 9 years) had worse mental health outcomes at 17 years compared to more affluent peers and that this association was partly mediated by cumulative risk exposure.

Despite an increase in research examining cumulative exposure to multiple stressors and the impact on both mental and physical health outcomes in children [18, 19], there is a lack of studies that have examined both cumulative exposure as well as whether exposure to stress disproportionately affects children from lower SES backgrounds [12, 15]. Although most studies have included exposure to low SES or poverty as one of the risk factors in the cumulative stress model, there have been few detailed investigations into how these factors interact [15]. Furthermore, there is a lack of studies which have examined whether cumulative risk exposure is associated with adverse outcomes in countries with equitable income distribution and an elaborate social safety net such as Norway.

Norwegian citizens are covered by the National Insurance Act which provides access to unemployment, sickness, and family-related benefits. Information, advice, and guidance to help solve social problems are also available. This includes financial advice and debt counseling, temporary accommodation, employment schemes, and health services. These social benefits may possibly buffer children and families from low SES backgrounds from exposure to some of the associated physical hardships and psychosocial stressors, but this has yet to be fully explored.

Due to these gaps in the research, we wanted to investigate the socioeconomic distribution of exposure to negative life events and family stress in a Norwegian cohort ($n = 2043$) of children aged 11–13 years. We also examined the direct and interactive associations between low SES and exposure to life events and family stress in relation with mental health problems. We expected there to be a higher frequency of negative life events and current family stressors in more disadvantaged families. Furthermore, we propose two different pathways through which adverse life events and family stressors influenced mental health: (1) they could have a differential impact on children from more disadvantaged families, such that the same level of adverse experiences would produce worse outcomes in children from poorer backgrounds, due to already limited coping resources among children from these backgrounds or (2) they could have independent and cumulative effects on mental health.

Methods

Participants

The current analyses are based on data from the Bergen Child Study, a series of cross-sectional multi-phase surveys of children born between 1993 and 1995 living in Bergen, the second largest city in Norway (see http://uni.no/en/bergen-child-study/ for more information).

The present study uses data from the second cross-sectional study (wave two) carried out in 2006 when the children were in fifth-to-seventh grades (11–13 years), in a target population of 9218. Mean age was 11.8 (SD = 0.8), with 52% girls. In the main phase of this wave, one parent, children, and teachers completed questionnaires on a total of 5791 children (teacher data are not included in the present study). All parents who took part in the screening phase were invited to participate in the second phase, which involved detailed psychiatric assessment using the Development and Well-Being Assessment (DAWBA; [20]). The participants provided information about their children using a special website that required logging in with a unique identification number and password. Responses from 2043 participants were obtained. The sample in the current study consisted of parents who participated in the detailed psychiatric assessment ($n = 2043$), and for those participants, we used information from their children about mental health problems

(see Fig. 1). The study was approved by the Regional Committee for Medical Research Ethics in Western Norway and the National Data Inspectorate.

Instruments

Socioeconomic indicators

Parents were asked to report their education level using the following options: elementary education (basic), high school education (intermediate), and education at college/university level (higher). They were also asked how they would describe the economic situation in their family relative to others, using options poorer than others, equal to others, or better than others. Participants who had parents with basic education level or poor perceived economic well-being were categorized as having lower perceived SES ($n = 264$).

Life events and family stress

Life events were assessed by a section of the DAWBA (previously described by [21]). Parents were presented with a list of ten life events, and asked to indicate whether a certain life event had been experienced by their children and their family during the last 12 months (e.g., "Has 'he/she' been in a serious accident?", "Has 'he/she' had a serious illness which required a stay in hospital?", and "Have you had a separation due to marital difficulties or broken off a steady relationship?"), responding with Yes or No. Cumulative exposure was calculated by counting up all affirmative responses for a total score out of 10.

Stressful life events were assessed in a separate section of the DAWBA. From a list of 17 statements, parents were also asked to indicate whether they currently were experiencing events that made their family life stressful (e.g., "You or your partner are unemployed", "Financial difficulties", and "Home inadequate for family's needs"), using the options No, or does not apply, A little and A lot. The response 'A lot' was counted as affirming exposure to the life event, and contributed to the cumulative exposure measure. The full list of items can be found in Table 2.

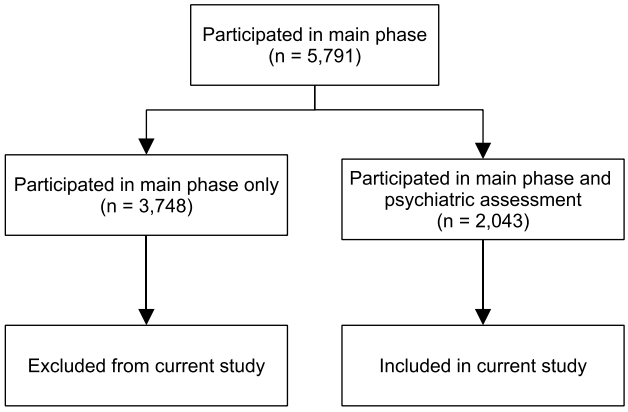


Fig. 1 Flowchart illustrating the sampling procedure

Mental health problems

The Strengths and Difficulties Questionnaire [SDQ; 22] were administered to all children participating in the screening phase. The SDQ consists of 25 items, five items per subscale, measuring symptoms of emotional, conduct, peer and hyperactivity/inattention problems, as well as a prosocial scale (not used in the current study) each with a range from 0 to 10. The SDQ has been found to have good internal consistency and concurrent and discriminant validity [23, 24].

Statistical analysis

Representativity of the sample was investigated by comparing symptoms of mental health problems among those who participated in the screening and psychiatric assessment phases with those who participated in the screening phase only using a Welch two-sample *t* test.

Participants reporting poor or very poor perceived economic well-being and/or basic parental education levels were categorized as having low SES ($N = 264$, 14%). The socioeconomic distribution of negative life events and family stress was investigated using Fisher's exact tests due to low number of expected frequencies in some cells. To avoid circularity in the operationalization of the variables, the items experiencing a major financial crisis ever (from life events) and financial stress (from family stress) were excluded from the main analysis. These items were significantly more common among those categorized as having low SES [28 (15%) vs. 45 (3%) for Major financial crisis ever and 6 (3%) vs. 5 (0.3%) for current Financial stress], in the lower and higher SES groups respectively (both $ps < 0.001$).

Cumulative indices of life events and family stress were created by adding up the number of positive responses. The scales were coded into 0, 1, 2, and 3 or more representing the number of negative life event or family stressors experienced by each participant. These cumulative indices were then used together with the dummy variable for low SES in separate regression analyses using the rms package [25] in R for Mac [26]. In the analyses, we first assessed the bivariate association between low SES and mental health (Model 1), then adjusted for life events/family stress to assess if the association attenuated (Model 2s), and finally, we investigated the interaction between low SES and life events/family stress. Linear models are presented, as the preliminary analysis did not suggest nonlinearity in any of the associations. Finally, we ran a mediation analysis using the R package *lavaan* [version 0.5–22; 27] to quantify the

direct and indirect effects in the regression models including negative life events and family stress. In accordance with current recommendations, bootstrapping was used for the indirect effects [28]. The mean number of missing responses across the data set was 14.6% and the highest proportion of missing data was for the item "Close friendship lost in last 12 months" (25% missing). Missing data were handled by listwise deletion.

Results

The tests of representativity demonstrated that the subsample participating in both the main phase and the psychiatric assessment phase ($n = 2043$) was slightly younger, and had higher SES (as indicated by good or very good perceived economic well-being and higher parental education levels). Participants in the subsample did not deviate from the main-phase-only sample in terms of gender distribution or symptoms of mental health problems as reported by their parents, see Table 1.

The frequency of experiencing negative life events and family stress in the whole sample was stratified by SES and is presented in Table 2.

Experiences of negative life events were relatively low in the sample, and did not appear related to socioeconomic level with the exception of marital breakdown, which had been experienced more often by participants with lower SES (41%) relative to their peers (16%, $p < 0.001$). There was also a higher frequency of cumulative exposure (i.e., exposure to more than one life event) among those with lower SES ($p < 0.001$).

Most participants reported few family stressors. There was some evidence of socioeconomic stratification in family stress. Parents with lower SES more often reported stress from unemployment, work, housing, tensions with ex-partners, as well as physical and mental health problems (all ps < 0.05), and as a consequence, also more accumulated family stress ($p < 0.001$).

In the regression analyses, lower SES was a significant predictor of increased emotional, conduct, peer, and hyperactivity/inattention problems, see Model 1 in Table 3. In the table, all coefficients (bs) were positive suggesting that as the value for lower perceived SES moved from 0 (indicating higher perceived SES) to 1 (indicating lower perceived SES), this was associated with a higher mean symptom level for each problem domain, corresponding to the value of b (i.e., for emotional problems, those with lower perceived SES had a mean symptom score that was 0.462 points higher than the

Table 1 Mean score on SDQ variables for respondents stratified by participation status

	Main phase only ($n = 3748$) % (n)	Main phase and psychiatric assessment ($n = 2043$) % (n)	p
Female	49.3% (133)	50.7% (1036)	0.744[b]
Age [mean (sd)]	12.2 (0.86)	12.1 (0.88)	0.013[a]
Perceived economic well-being			< 0.001[b]
Poor/very poor	3.2% (95)	2.2% (44)	
Average	30.9% (921)	26.5% (519)	
Good	51.8% (1546)	53.5% (1048)	
Very good	14.1% (420)	17.8% (349)	
Maternal education level			< 0.001[b]
Basic	10.0% (295)	5.6% (109)	
Intermediate	41.0% (1211)	33.2% (648)	
Higher	49.0% (1450)	61.2% (1195)	
Paternal education level			< 0.001[b]
Basic	9.0% (258)	7.7% (147)	
Intermediate	43.2% (1237)	33.8% (643)	
Higher	47.7% (1366)	58.4% (1111)	
SDQ total problems [mean (sd)]	5.32 (4.68)	5.31 (4.87)	0.923[a]
SDQ emotional problems [mean (sd)]	1.17 (1.63)	1.24 (1.73)	0.176[a]
SDQ conduct problems [mean (sd)]	0.81 (1.12)	0.80 (1.16)	0.856[a]
SDQ hyperactivity/inattention [mean (sd)]	2.29 (2.02)	2.26 (2.08)	0.548[a]
SDQ peer problems [mean (sd)]	1.04 (1.61)	1.01 (1.64)	0.429[a]

[a] Welch two-sample t test for unequal variance

[b] Chi-square test

Table 2 Frequency of negative life events and family stresses in total sample, and stratified by SES category

	Total sample ($n=1907$) % (n) confirming	Higher SES ($n=1643$) % (n) confirming	Lower SES ($n=264$) % (n) confirming	p values from Fisher's exact tests[a]
Negative life events (ever)				
Close friendship lost in last 12 months	10.1% (146)	9.8% (125)	12.1% (21)	0.348
Marital breakdown	19.2% (299)	16.1% (220)	40.9% (79)	< 0.001
Parental problems with police	0.9% (14)	0.7% (10)	2.1% (4)	0.084
Parental serious physical illness	4.9% (77)	4.8% (65)	6.2% (12)	0.373
Parental serious mental illness	4.0% (63)	3.8% (52)	5.7% (11)	0.238
Parent or sibling died	2.7% (42)	2.5% (34)	4.1% (8)	0.229
Close friend died	4.1% (64)	4.0% (55)	4.7% (9)	0.697
Serious illness	11.2% (174)	11.4% (155)	9.8% (19)	0.625
Serious accident	3.0% (46)	2.8% (38)	4.1% (8)	0.263
Accumulated Negative life events				< 0.001
0	57.6% (826)	59.3% (750)	44.4% (76)	
1	30.3% (435)	30.3% (383)	30.4% (52)	
2	8.9% (128)	7.7% (97)	18.1% (31)	
3 or more	3.4% (46)	2.7% (34)	7.0% (12)	
Family stresses (current)				
Unemployment stress	0.5% (8)	0.2% (3)	2.6% (5)	0.001
Work stress	1.9% (29)	1.5% (20)	4.6% (9)	0.007
Housing stress	1.5% (23)	0.8% (11)	6.2% (12)	< 0.001
Neighbourhood stress	0.2% (3)	0.2% (3)	0% (0)	1.000
Time pressure	5.9% (92)	5.8% (79)	6.7% (13)	0.625
Lack of social support	1.7% (27)	1.5% (20)	3.6% (7)	0.068
Quarrels between children	2.6% (40)	2.3% (31)	4.7% (9)	0.082
Rows between children and adults	1.2% (18)	1.2% (16)	1.0% (2)	1.000
Tension with partner	1.2% (19)	1.2% (16)	1.5% (3)	0.722
Tension with ex-partner	2.5% (38)	2.1% (29)	4.6% (9)	0.045
Stress from parent physical health	1.7% (27)	1.4% (19)	4.1% (8)	0.013
Stress from parent mental health	0.6% (10)	0.4% (5)	2.6% (5)	0.004
Stress from other people's illness	2.0% (31)	2.0% (27)	2.1% (4)	1.000
Stress from family substance abuse	0.6% (10)	0.5% (7)	1.5% (3)	0.118
Stress from gambling	0.1% (2)	0.1% (2)	0% (0)	1.000
Accumulated Family stresses				< 0.001
0	84.3% (1265)	85.5% (1123)	75.9%(142)	
1	9.8% (147)	9.4% (124)	12.3% (23)	
2	4.1% (61)	3.6% (47)	7.5% (14)	
3 or more	1.8% (27)	1.4% (19)	4.3% (8)	

[a]Comparison of frequencies in higher and lower SES group

mean symptom score for those with higher perceived SES). The standard error of the coefficient (in brackets) is the average distance that the observed values fall from the regression line (b) and are an indication of the dispersion of the data. Smaller standard errors indicate that observations are closer to the regression line, whereas larger standard errors indicate that the regression line has a poorer fit to the data.

When adjusting for negative life events, the association between socioeconomic status and mental health problems attenuated somewhat across all domains of mental health problems, and was no longer significant for conduct problems. Similar observations were made in models adjusting for family stress, but in these analyses, all associations with lower SES remained significant also after adjustment. In the adjusted models, negative life events and family stress were both significantly associated with mental health problems across all domains of mental health problems, suggesting that higher exposure was related to more symptoms

Table 3 Results from regression analysis

	Emotional problems			Conduct problems			Peer problems			Hyperactivity-/inattention		
	Model 1	Model 2a	Model 2b	Model 1	Model 2a	Model 2b	Model 1	Model 2a	Model 2b	Model 1	Model 2a	Model 2b
	b (*se*)	*b* (*se*)	*b* (*se*)	*b* (*se*)	*b* (*se*)	*b* (*se*)	*b* (*se*)	*b* (*se*)	*b* (*se*)	*b* (*se*)	*b* (*se*)	*b* (*se*)
Lower SES	0.462***	0.430**	0.502***	0.365***	0.156	0.254***	0.423***	0.364**	0.460***	0.753***	0.646***	0.618***
	(0.119)	(0.145)	(0.139)	(0.082)	(0.100)	(0.094)	(0.102)	(0.122)	(0.118)	(0.134)	(0.163)	(0.156)
Life events		0.316***			0.165***			0.225***			0.277***	
		(0.059)			(0.041)			(0.050)			(0.067)	
Family stresses			0.306***			0.229***			0.254***			0.429***
			(0.075)			(0.051)			(0.064)			(0.084)
R^2	0.008	0.029	0.022	0.010	0.015	0.020	0.009	0.023	0.023	0.017	0.026	0.031
Adjusted R^2	0.007	0.028	0.021	0.010	0.013	0.019	0.009	0.022	0.022	0.016	0.025	0.029
Effect size f^2	0.008	0.030	0.022	0.010	0.015	0.020	0.009	0.024	0.024	0.017	0.027	0.032
Indirect effect	–	0.11*** (0.03)	0.06** (0.02)	–	0.06** (0.02)	0.05** (0.01)	–	0.08*** (0.02)	0.05** (0.02)	–	0.10*** (0.03)	0.09** (0.03)
Total effect	–	0.54*** (0.14)	0.56*** (0.14)	–	0.21* (0.10)	0.30** (0.09)	–	0.44*** (0.12)	0.51*** (0.12)	–	0.74*** (0.16)	0.70*** (0.16)

Model 1 = lower SES as predictor of mental health problems. Model 2a = Model 1 + negative life events. Model 2b = Model 1 + family stresses. Unstandardised coefficients shown $p < .05$, ** $p < .001$, *** $p < .001$

of mental health problems, but the effect sizes were small. There was no evidence of an interaction effect between lower SES and negative life events or family stress (all p values > 0.05, results not shown). This suggests that lower SES and negative life events/family stress influence mental health problems additively, as illustrated in Fig. 2.

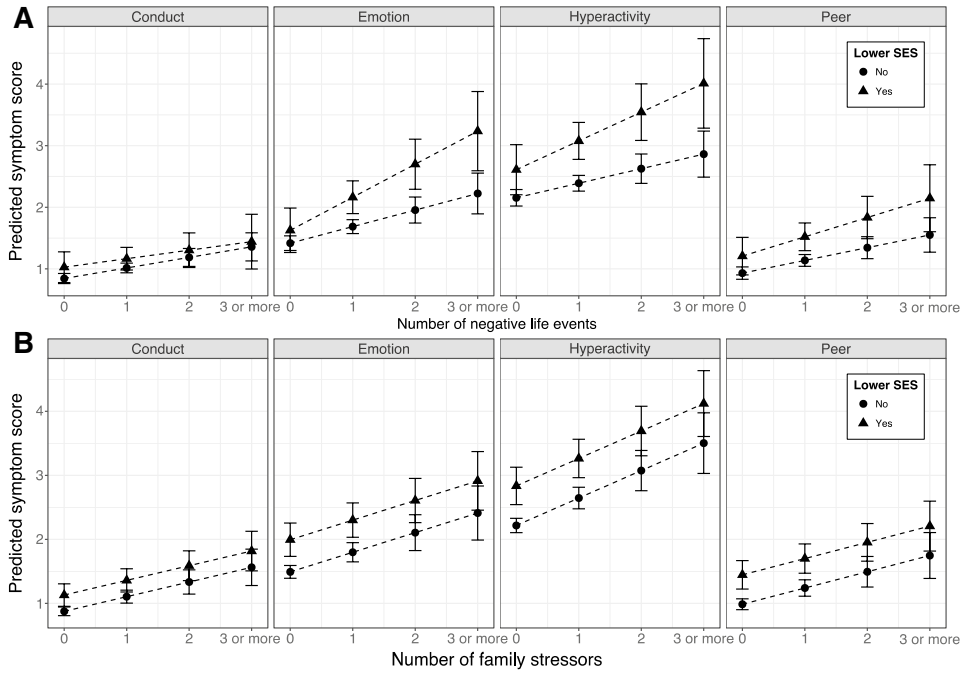
Figure 2 illustrates how more frequent exposure to negative life events (panel a) and family stress (panel b) is associated with more symptoms of mental health problems. The two lines (triangles indicate the group of children with low SES background, whereas circles indicate the group without low SES background) appear relatively parallel, suggesting no differential impact of exposure among those with low SES. There is some deviation from this pattern for emotional and hyperactivity/inattention problems in relation with higher frequency of negative life events, but the statistical tests of interactions were not significant (i.e., emotional problems, $p = 0.09$; hyperactivity/inattention, $p = 0.19$).

Mediation analysis revealed that, across all models, there were significant indirect effects of negative life events and family stress on mental health problems in the range of 0.5–0.11. Indirect effects suggest that the associations between low SES and mental health problems were partially mediated by negative life events and family stress, but the magnitude of the indirect effects was relatively modest, corresponding to 10–29% of the total effects.

Discussion

The aims of the current study were to investigate the socioeconomic distribution of exposure to negative life events and family stress among Norwegian children and to assess the direct and interactive association between low SES and exposure in relation with mental health problems. There was evidence of socioeconomic stratification of exposure to some life events and family stressors, and exposure to these stressors was associated with more symptoms of mental health problems. The association between low SES and mental health problems attenuated when adjusting for life events and family stress, suggesting that these may be mechanisms responsible for some of the association, and this was further supported by significant indirect effects in the mediation analyses. Mainly, however, low SES, family stress, and life events were independently associated with mental health problems in the current sample and did not interact.

Children from families with lower SES had more symptoms of mental health problems relative to their higher SES peers. This finding is in agreement with a large number of the previous investigations [1, 3]. The results did not find support for children of lower SES background experiencing more negative life events relative to their peers with higher SES. The exception was in regards to marital dissolution,



Note. The figure illustrates that the mean symptom of mental health problems is greater for participants with higher number of negative life events (A) and family stressors (B). The symbols on the plot indicate whether the participant has lower SES (triangle) or not (circle). Conduct = conduct problems, Emotion = emotional problems, Hyperactivity = hyperactivity-/inattention problems, Peer = peer problems.

Fig. 2 Predicted symptoms of mental health problems on the Strengths and Difficulties Questionnaire associated with negative life events, and family stresses, stratified by SES

which was experienced by significantly more participants in the lower SES group. Marital dissolution could be a result of having lower SES, as divorce rates are found to be higher among socioeconomically disadvantaged [29]. Lower SES could also result from divorce, as many live in a single parent household following marital dissolution, which is associated with poorer economic resources in Norway [30]. Our cross-sectional study is limited in that we do not have access to historic information about SES and marriage status which would enable us to investigate the predicted causal association further.

In regards to our second measure of environmental adversity, that is family stress, there was more evidence of socioeconomic stratification. Respondents with low SES backgrounds reported significantly more stress on their family life from unemployment, their work situation, housing inadequacies, lack of social support, quarrels between children, tension with ex-partners, and problems with their own or their partner's physical and/or mental health. These findings suggest that children from Norwegian families with low SES backgrounds do experience more stressful physical and psychosocial surroundings relative to their higher SES peers, consistent with the previous investigations [12, 15].

Overall, the associations between lower SES and experiencing negative life events and family stress and mental health problems were modest, but the proportion of explained variance increased substantially when negative life events and family stress were added to the regression models relative to the model only including lower SES. In support of the cumulative stress perspective, lower SES, negative life events and family stress had independent and cumulative effects on mental health, but there was no evidence of differential impact of these events in children from lower SES backgrounds.

Small effects of poverty and cumulative risk on externalizing problems were also obtained in a previous US study [17]. Still, although the measures are not directly comparable, the effects in the US sample were 4–5 times larger than what was found for externalizing problems in the current sample (i.e., conduct problems). That same study also found that 45% of those exposed to poverty had housing problems, whereas this was reported by only 6% of Norwegian participants with lower SES in the current study. More generally, exposure to individual risk factors, as well as the associated influence on mental health problems of lower SES and accumulation of risk factors were lower, in terms of comparing effect sizes, relative to what has been found in several previous studies [15]. This may be a result of the buffering effects of the elaborate social safety net in place in Norway, although comparative studies in countries with

different social welfare policies using more directly comparable measurements are needed to substantiate this finding.

Among the strengths of the current study is the relatively large sample, the use of independent raters of SES, life events, and family stress (parent reported), and mental health problems (self-reported by children), and the extensive list of potential stressful events both affecting the child directly, and more indirectly through influencing family life. The findings must also be interpreted in light of several methodological limitations. First, in line with many previous investigations [15], this study is cross section, precluding the opportunity to disentangle the causal directions of the associations among low SES and negative life events and family stress. However, few of the life events and family stress items, with the exception of divorce (and consequential single parenting) and unemployment would presumably cause lower SES. Somatic and mental illness could be related to lower SES either through restricted education or through unemployment opportunities, but the frequency of such illnesses was relatively low in the current sample, and it is just as likely that illness could be a result of low SES as it could be a precursor for it [31, 32]. A second limitation relates to the use of self-reported experiences of these events. In general, there is a risk of incorrect recollection in life-event research [33], and there may also be a systematic recall bias of relevant events particular to those of lower SES. However, there is no reason to assume that the current study, for some reason, was particularly susceptible to these biases and that the results and relative magnitude of the associations in comparisons with the previous investigations, therefore, are not valid. Furthermore, Norway is a country with low levels of poverty and economic inequality. Due to a progressive tax system, and a welfare system where economically disadvantaged families are allowed both housing subsidies and means-tested temporary social benefits, absolute levels of deprivation, experience of material hardship, and inability to afford basic amenities such as food and housing is uncommon [34]. This context may restrict the external validity of the findings, and as such, the results reported in the current study may represent a conservative estimate of the associations between low SES, experience of negative life events and family stress, and mental health problems. In addition, the measure of SES used in the current study was partly based on objective indicators of SES (parental education) and a subjective indicator (perceived economic well-being). As such, the results may have been different had we used objective indicators only. In the previous research, however, economic well-being has been found to be associated to household income and other objective indicators of SES [3, 35], and subjective indicators have also been found to be related to health [36].

In summary, we found that lower SES was associated with more symptoms of mental health problems in this sample of Norwegian 11–13 years. There was evidence of socioeconomic stratification of exposure to some life events and family stressors, and exposure to these was associated with more symptoms of mental health problems. Comparisons of effect sizes suggested that the magnitude of associations was smaller in the current study relative to the previous investigations.

Our findings demonstrate that families from lower SES backgrounds do experience more stressors and have more frequent experiences of negative life events, which may increase the overall burden on these families. When providing mental health services to these adolescents, extra care should be made to assess possible life stressors and negative life events, and interventions directed on a family- and systemic level may be necessary in addition to individually focused interventions.

Compliance with ethical standards

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