ORIGINAL CONTRIBUTION

Impact of life events on child mental health before school entry at age six

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Abstract The study examined the association between life events and early child mental health prior to school entry. The impact of single life events and the cumulative effect of multiple life events on child mental health were examined. In a northern German city, the complete 1-year intake of preschool children at the primary school entry assessment was included. In 1,887 children, life events and psychiatric symptoms were recorded by means of standardized parent questionnaires. Included were all life events between child's birth and school entry. For more than 80 percent of all children, at least one life event was reported. The number of life events was independent of any demographic variable; the mean was 2.2. The number of life events had a highly significant effect on the prevalence of child mental health problems. Six family-change-factors, especially coherent in content, could be identified by factor analysis. The study provides important data on the epidemiology and clinical impact of life events and psychopathology in early childhood. For child mental health, the cumulative effect of multiple life events was found to be much more important than the effect of specific single life events.

Keywords Child mental health · Life events · Preschool age · School entry

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Introduction

Stressful life experiences constitute a potential threat to the mental health and development of children. Studies of potential stressors distinguish between acute traumatic events, chronic strains or adversities, and stressful life events [17]. The latter are the subject of the present study. There has been extensive research over the last three decades on stressful life events and their implications for emotional and behavioral psychopathology [17, 36]. The importance of life events for the onset of psychiatric disorders was first shown in adults [4], and later also in children and adolescents [8, 15, 24]. A number of controlled studies in adolescents have shown that episodes of depression were preceded by an accumulation of life events [16, 29].

A recent longitudinal study has shown a very strong association between stressful life events in childhood and depressive symptoms and antisocial behavior in young adults [34]. In children, a significantly increased number of life events was reported prior to the onset of such mental health problems as mood disorders and depression [15, 21, 23, 38], as well as enuresis, externalizing behavior, suicidal tendencies, and anorexia nervosa [22]. The impact of stressful life events at preschool age was presented by Luby and colleagues [24]. In a clinical sample of $N = 119$, stressful life events accounted for 10% of the total variance in depression severity scores.

A neurobiological mechanism proposed by Heim and Nemeroff [20] emphasizes the role of stressful life events especially in early childhood and preschool age. Early life stress induces persistent hyperactivity of hypothalamic pituitary axis (HPA), resulting in increased endocrine, autonomic, and behavioral stress responsiveness. With repeated exposure to early life stress, this vulnerability may

result in symptoms of depression, anxiety disorders, and a variety of psycho-physiological abnormalities [20].

Studies of stressful life events as risk factor for child mental health have often focussed on the specificity of either the stressor or the outcome [18, 26]. The most complex model, the stressor-outcome specific model, simultaneously tests the hypotheses that particular stressful events predict particular psychiatric symptoms. Next to specificity, studies of life events and developmental psychopathology also consider models, wherein many different stressors can lead to the same outcome (equifinality), and similar stressors lead to multiple outcomes (multifinality) [7]. The results of a comprehensive review on the association between life events and psychiatric symptoms provided some evidence of equifinality and multifinality [26].

Despite numerous studies on the role of life events in adults, adolescents and older children, there is still little research on life events and child mental health at preschool age [28]. Yet research on this specific age group is important, particularly with regard to the developmental stage of children at preschool age and their limited ability to cope with stress and stressful life events [15]. Age differences have been observed in judging the stressfulness of an event [5]. In addition, the psychological adjustment, which is required to cope successfully with a specific life event, varies between adolescents and children. Therefore, in research about life events experienced by preschool children, an age-appropriate assessment is needed.

Most studies of life events covered a period of only 6 or 12 months prior to investigation [32]. To examine the cumulative effect of multiple events over time [13, 33], it is necessary to include a broader time span. The examination of possible cumulative effects of multiple life events is one of the key issues on methodology in life event research [33].

The present study investigated the frequencies of life events and their impact on child mental health. A population-based sample of preschool children was assessed and the survey covered the period from birth to primary school entry. In addition to the impact of specific life events on child mental health, the cumulative effects of multiple life events were also examined.

Method

Sample and procedure

The sample included the complete 1-year intake of preschool children, who were enrolled in primary school in a northern German city with a population of 260,000 inhabitants. The data collection was the first part of a 4-year longitudinal study finished in 2001. Approximately,

6 months prior to school entry, all children underwent a mandatory pediatric and developmental assessment. At this point, the accompanying adult caregiver of each child was asked to take part in the study by completing some questionnaires. Basic demographic data, including educational and vocational data of the parents, number of siblings, immigrant status, and marital status were recorded. The participation was voluntary and independent of the medical assessment. Either the questionnaires were completed by the parents immediately or they were taken home, completed, and returned by mail.

The total number of children who were enrolled in the school entry assessment was 2,561. Due to the representative nature of the study, no exclusion criteria were defined. The questionnaires of exactly 2,000 children were completed and returned (78.1%). In accordance with the manual [1] questionnaires were discarded as invalid, when eight or more items had not been completed. The incomplete data of 113 subjects (5.7%) were excluded from the study.

The sample consisted of 1,887 children—975 boys (51.7%) and 912 girls (48.3%) between the ages of 5.0 and 6.9 years and a mean age of 6.0 (SD 0.38). The mean age represented the relatively higher age at school entry in Germany, which is set at age six. This age at school entry is comparable to the situation in some other European countries, including Sweden and Finland.

In 1,545 cases (81.9%), the child lived with both parents, 301 children (16.0) lived in a one parent family, 290 (15.4%) of them with a single mother, 11 (0.6%) with a single father. Seven children (0.4%) lived with other relatives or in foster care. In 349 cases, the child had no sibling (18.5%), 940 children had one sibling (49.8%), 413 had two (21.9%), and 185 had three or more siblings (9.8%). The parents of 1,773 children were German (94%) and 114 were immigrants (6%). There was neither significant difference in the number of siblings, the educational level achieved by the parents and their job situation, in the number of single and two-parent families, nor in age and sex of the children between sample and population [14].

Measures

Stressful life events

The stressful life events measure used in this study was developed to assess stressors over longer time periods. The measure consists of 17 items and has proved to meet the special needs of young children [5]. According to the authors, the internal consistency of this measure is 0.67 (Cronbach's alpha) and the 6-week test–retest reliability is 0.61 [31]. The parents were asked to mark all events the child had experienced during his or her lifetime.

Child mental health problems

Child mental health problems were assessed by the German version of the Child Behavior Checklist (CBCL 4–18) [1, 3]. The CBCL 4–18 is accepted as a screening instrument for childhood psychopathology [37]. It has been shown that dimensional CBCL scores correlate significantly with categorical data of psychiatric diagnoses from structured interviews [11]. The CBCL 4–18 consists of 118 items describing a wide domain of behavioral and emotional problems of children.

Parents rate their children's problems during the past 6 months on a scale of 0 (*not true*), 1 (*somewhat* or *sometimes*), and 2 (*very true* or *often true*). The CBCL 4–18 showed satisfactory psychometric properties in a representative German sample [9]. The good reliability and validity of the CBCL [1] were confirmed for the German version of the measure [9]. Cronbach's alphas of Total, Internalizing, and Externalizing scales ranged from 0.94 to 0.81. The test–retest reliability over a period of 5 weeks was 0.81. The checklist provides *T-score*s based on national norms for eight syndrome scales, two broadband scales of internalizing and externalizing behavior and the total score. Four items about school, drugs and sexual problems were dropped from the CBCL (item 73, 96, 101, 105), because they were considered not applicable to preschool children. The deletion of these items was in accordance with other studies of preschool children [12, 19]. The presence of mental health problems was assumed if a child met or exceeded the clinical cut-off on the total score ($T \geq 64$) or on one of the eight syndrome scales ($T \geq 71$) [1].

Statistical procedure

First, we present the life event frequencies for the total sample and separated according to sex (boy/girls). Differences in the frequencies of life events between boys and girls were tested using χ^2-tests. Due to the 17 life event categories, the global α-level of 5% was adjusted by Bonferroni correction ($P = 0.05/17 = 0.0029$).

Then we describe on a global level, the cumulative effect of life events on mental health problems. To focus on the clinical significance, the CBCL scores were transformed into the binary variable of children with and without mental health problems by means of clinical cut-off scores [1]. This is followed by a detailed analysis of the influence of single life events on CBCL scores.

To investigate the impact of each single life event on child mental health analyses of variance were conducted. Here, with regard to the heuristic approach of these analyses, no alpha-adjustment was done.

In the next step, we investigated the co-occurrence of life events by an oblique exploratory factor analysis in order to extract higher-order changes. The number of valid factors was computed by means of the Kayser–Guttman criterion. An item was considered to be part of a factor if the item-loading exceeded 0.50. The presence of a factor was defined by the presence of at least one associated life event. The impact of these factors on child mental health was examined comparably to previous analysis related to single-life-events.

Results

Incidence of life events

The frequency of each life event is given in Table 1. The incidence rates indicate that some life events are more common in early childhood. Four of the 17 events have an incidence ranging from 25 to 40%. The most frequent life events experienced by children at preschool age are *"Birth of a new sibling"*, *"Death of a relative (non-parent)"*, and two events related to physical health *"Stay in hospital"* and *"Operation of the child"*. Events such as remarriage, accident, or the death of a parent are very rare and below 2, respectively, 1%.

Boys had a significantly higher incidence in both physical health related life events, *"Medical operation"* and *"Stay in Hospital"* ($P < 0.05$, adjusted). In the incidence of life events, no further significant difference between boys and girls was found.

Number of life events

The total number of life events of a child from birth to school entry was in the range of 0 and 9, with a mean of 2.2. The experience of 1 life event was reported for 475 (25.2%) children, 415 (22.0%) children had experienced 2 life events, and 691 (36.7%) children 3 and more. No life event was reported for 306 (16.2%) children. On average, a child had experienced at least two life events before school entry. For more details, see Table 2.

Demographic features had no significant effect on the number of life events: sex [$F(1, 1564) = 1.71$, $P = 0.19$], number of siblings [$F(2, 1564) = 1.90$, $P = 0.15$], educational level of the parents [$F(2, 1564) = 1.35$, $P = 0.26$], and immigration [$F(1, 1564) = 0.76$, $P = 0.38$].

Impact of cumulative life events on child mental health

The number of life events had a highly significant effect ($P < 0.001$) on the number of internalizing problems, externalizing problems, and the total problem score. The explained variance of the total score by the number of life events was 9%.

Table 1 Frequencies of life events

Event	Boys (975 = 100%)	Girls (912 = 100%)	Total (1,887 = 100%)
New sibling born	408 (41.8)	352 (38.6)	760 (40.3)
Relative (nonparent) died	260 (26.7)	258 (28.3)	518 (27.5)
Medical operation	*278* (*28.5*)	*190* (*20.8*)	468 (24.8)
Sick in hospital	*273* (*28.0*)	*190* (*20.8*)	463 (24.5)
Parent restarted work	183 (18.8)	177 (19.4)	360 (19.1)
New nursery school	150 (15.4)	145 (15.9)	295 (15.6)
Family moved	135 (13.8)	139 (15.2)	274 (14.5)
Best friend moved	120 (12.3)	116 (12.7)	236 (12.5)
Parents separated	128 (13.1)	101 (11.1)	229 (12.1)
Father away on business	61 (6.3)	65 (7.1)	126 (6.7)
Parents divorced	64 (6.6)	53 (5.8)	117 (6.2)
Relative/friend moved in	59 (6.1)	45 (4.9)	104 (5.5)
Parent lost job	53 (5.4)	43 (4.7)	96 (5.1)
Older sibling left home	20 (2.1)	20 (2.2)	40 (2.1)
Parent remarried	22 (2.3)	14 (1.5)	36 (1.9)
Parent had an accident	20 (2.1)	9 (1.0)	29 (1.5)
Death of a parent	9 (0.9)	8 (0.9)	17 (0.9)

Significant differences between boys and girls are in *bold italics* $P < 0.05$, adjusted by Bonferroni correction: $P < 0.0029$

Table 2 Number of life events and associated prevalence of child mental health problems

Number of life events	N (%)	Prevalence of mental health problems (%)	
None	306 (16.2)	5.6	7.7% (N = 1,196)[a]
1	475 (25.2)	8.0	
2	415 (22.0)	9.2	
3	303 (16.1)	14.2	20.4% (N = 691)[b]
4	187 (9.9)	20.9	
≥5	201 (10.7)	29.4	
Total:	1,887 (100)	12.4	

[a] Low event group of two or less life events

[b] High event group of three and more life events

In Table 2, the prevalence of child mental health problems is given for each number of life events. The listing indicates that this prevalence increased with the number of life events. The correlation between the number of life events and CBCL Total problem score is $r = 0.29$ ($P < 0.001$). To illustrate the clinical significance, we separated the total sample by the arithmetic mean into a low event group (two or less life events; $N = 1,196$) and a high event group (three and more life events; $N = 691$). In the high event group, the prevalence of child mental health problems is 20.4%, in contrast to the low event group with a prevalence of only 7.7%. The difference in the prevalence of child mental health problems between low and high event group is highly significant [$\chi^2(N = 1,887, df = 1) = 62.28, P < 0.001$].

Impact of a specific single life event

To evaluate the impact of a specific single life event on child mental health, we compared children with only one life event ($N = 475$) to peers without any life event ($N = 306$). In Table 3, the mean *T-score*s of the CBCL syndrome scales, two broadband scales, and total scale are given for each single life event together with the data for children without any life event and the data for all children.

Two of 17 life event items were associated with a significantly increased CBCL total score, "*Parent restarted work*" [$F(1, 342) = 5.85, P = 0.016$] and "*Move of best friend*" [$F(1, 333) = 4.70, P = 0.031$]. In "*Parent restarted work*", the increased CBCL total score correlated with significantly more internalizing [$F(1, 342) = 9.08, P = 0.003$], and externalizing problems [$F(1, 342) = 5.99, P = 0.015$]. The scores of two internalizing syndrome scale were also significantly increased: *Somatic Complaints* [$F(1, 342) = 11.76, P = 0.001$] and *Anxious/Depressed* [$F(1, 342) = 7.02, P = 0.008$]. In "*Move of best friend*", significantly more internalizing problems were found [$F(1, 333) = 12.68, P < 0.001$] and the scores of two internalizing syndrome scales were significantly increased: *Withdrawn* [$F(1, 333) = 7.24, P = 0.008$] and *Anxious/Depressed* [$F(1, 333) = 11.40, P = 0.001$].

The small number of three children who had lost a parent to death showed significantly lower CBCL total, externalizing and internalizing scores [$F(1, 307) = 8.73, P = 0.003; F(1, 307) = 6.37, P = 0.01; F(1, 307) = 3.92, P = 0.049$]. Due to the limited *T-score*s on the lower end of the syndrome scales, scores starting at the population

Table 3 Mean *T*-Scores of CBCL scales for children with none or one single life event

	N	With-drawn	Somatic complaint	Anxious/ depressed	Social problems	Thought problems	Attention problems	Delinq. beh.	Aggress. beh.	Internal. beh.	External. beh.	Total score
Total	1,887	54.8	54.0	55.3	53.9	52.5	53.8	54.4	54.5	52.9	51.8	52.0
No life event	**306**	**53.5**	**52.8**	**53.5**	**52.9**	**51.5**	**52.6**	**53.6**	**53.1**	**49.8**	**49.5**	**49.2**
New sibling born	160	53.7	52.9	54.1	52.9	52.1	53.1	53.4	53.3	50.8	49.8	49.6
Relative (non-parent) died	83	53.3	52.9	53.8	52.2	52.0	51.8	53.3	53.5	50.2	49.7	49.0
Medical operation	33	54.5	52.7	54.4	53.8	50.5	54.5	54.3	55.3	51.2	52.1	51.4
Hospitalized	29	55.0	52.5	54.6	55.1	52.7	52.8	55.2	54.6	51.7	51.8	52.0
Parent restarted work	38	53.9	**55.7****	**55.7****	53.4	52.1	52.5	54.9	53.9	**54.1****	**52.9***	**52.5***
New nursery school	21	53.5	52.7	53.5	52.9	51.6	52.6	53.5	53.0	49.8	49.5	49.1
Family moved	14	53.6	53.6	54.0	53.1	51.9	52.3	52.1	51.7	52.2	48.3	48.6
Best friend moved	29	**56.2****	54.1	**56.8****	54.6	52.2	52.0	55.1	53.6	**55.5****	50.8	**52.6***
Parents separated	33	54.3	53.2	54.4	53.8	52.7	53.0	53.1	52.6	51.5	48.3	48.9
Father away on business	8	55.4	56.9	52.5	51.1	50.0	52.3	55.4	55.1	52.8	53.3	52.3
Parents divorced	17	55.6	50.8	53.8	52.9	50.5	52.9	52.9	52.6	49.9	47.9	47.3
Relative/friend moved in	3	53.5	52.8	53.4	52.9	51.5	52.6	53.6	53.0	49.8	49.5	49.1
Parent lost job	4	56.5	51.8	52.8	51.5	52.3	50.8	51.8	51.3	53.8	47.3	49.5
Older sibling left home	6	54.8	56.0	53.5	52.8	50.0	52.3	53.7	53.3	53.3	51.0	53.0
Parent remarried	1	50.0	50.0	54.0	59.0	59.0	58.0	50.0	52.0	49.0	50.0	52.0
Parent had an accident	2	55.0	50.0	53.5	50.0	50.0	52.5	50.0	50.0	48.0	45.0	45.5
Death of a parent	3	50.0	52.3	50.0	50.0	50.0	50.0	50.0	50.0	**40.3***	**37.7****	**35.3****

* *P* ≤ 0.05, ** *P* ≤ 0.01

mean of *T* = 50, there could be no effect on the lower end of those scales.

Co-occurrence of life events

To date, we considered single life events to be independent. However, there may be higher order changes in the family, which lead to related single life events. To give an example: assuming a father begins a new job, this might implicate a home move and change of kindergarten—three life events take place at once. The exploratory factor analysis suggested six higher-order "family-change-factors", which explained 48.7% of the total variance (see Table 4). These six factors are well interpretable as (1) "separation/ divorce", (2) "child's health", (3) "move", (4) "parents' job", (5) "parents' health", and (6) "family members".

Impact of a specific family-change-factor

The impact of changes in the family on child mental health was examined similar to previous analysis related to single life events. In five out of six family-change-factors, the

frequencies of children with one specific family-change-factor were between 48 and 222 (see Table 5). In the following analyses, we compared only those children with life events out of one family-change-factor ($N = 591$) with children without any life event ($N = 306$). The mean *T*-scores of the CBCL scales for each family-change-factor are given in Table 5.

Two out of six family-change-factors showed significantly higher total problem scores: factor 3 and factor 4. Next to the increased total score, factor 3 (Move, New kindergarten, Father away on business) was associated with a significantly higher internalizing problem score [$F(1, 403) = 12.91, P < 0.001$]. Moreover, the scores of the three internalizing syndrome scales *Withdrawn* [$F(1, 403) = 9.44, P = 0.002$], *Somatic Complaints* [$F(1, 403) = 5.59, P = 0.019$], and *Anxious/Depressed* [$F(1, 403) = 6.74, P = 0.01$] were significantly increased. Factor 4 (Parent lost job or restarted work) was associated with both significantly higher internalizing [$F(1, 352) = 9.48, P = 0.002$] and externalizing problem scores [$F(1, 352) = 7.22, P = 0.008$]. On syndrome level, the scores of *Somatic Complaints* [$F(1, 352) = 9.55, P = 0.002$], and *Anxious/Depressed* [$F(1, 352) = 5.97, P = 0.015$] were significantly increased.

Table 4 Results of factor analysis: six higher-order *family-change-factors*

Factor no.	Factor name	Eigen-value	Single life events (factor loadings in brackets)
1	"Separation/divorce"	1.97	Parents separated [0.68], parents divorced [0.79], parent remarried [0.62]
2	"Child's health"	1.58	Sick in hospital [0.81], medical operation [0.80] (relative, non-parent, died [0.34])[a]
3	"Move"	1.44	Family moved [0.78], new nursery school [0.75] (father away on business [0.48])[a]
4	"Parents' job"	1.15	Parent lost job [0.79], parent restarted work [0.75]
5	"Parents' health"	1.11	Parent had an accident [0.68], death of a parent [0.56] (best friend moved [−0.36])[a]
6	"Family members"	1.03	New sibling born [0.69], older sibling left home [−0.60] (relative/friend moved in [0.35])[a]

[a] Items in brackets with loadings below 0.50 are not considered to be part of the family-change-factor

Table 5 Mean *T*-Scores of CBCL scales for children of each family-change-factor

	N	With-drawn	Somatic complaint	Anxious/depressed	Social problems	Thought problems	Attention problems	Delinq. behavior	Aggress. behavior	Internal. behavior	External. behavior	Total score
No life event	**306**	**53.5**	**52.8**	**53.5**	**52.9**	**51.5**	**52.6**	**53.6**	**53.1**	**49.8**	**49.5**	**49.2**
Factor 1: "Separation/Divorce"	51	54.2	53.2	54.3	53.5	51.9	53.4	53.1	52.7	51.2	48.7	48.6
Factor 2: "Child's health"	222	53.8	53.1	54.2	53.5	51.8	52.7	53.8	53.7	50.9	50.3	50.2
Factor 3: "Move"	99	55.4**	54.2*	55.0**	53.7	52.3	52.8	54.2	53.4	53.3**	50.7	51.2*
Factor 4: "Parents' job"	48	54.0	55.1**	55.3*	53.2	52.0	52.3	54.4	54.3	53.7**	52.9**	52.3**
Factor 5: "Parents' health"	5	52.0	51.4	51.4	50.0	50.0	51.0	50.0	50.0	43.4	40.6*	39.4**
Factor 6: "Family members"	166	53.7	53.0	54.1	52.9	52.1	53.0	53.4	53.3	50.9	49.9	49.7

* $P \leq 0.05$, ** $P \leq 0.01$

Values in bold are baseline or reference scores

Comparable to the results of specific single life events the family-change-factor 5 (death or accident of a parent) was associated with a significantly lower total score [$F(1, 309) = 7.20$, $P = 0.008$] and significantly less externalizing problems [$F(1, 309) = 6.00$, $P = 0.015$].

Discussion

This large-scale population-based study examined the association between life events and child mental health in 1,887 children prior to school entry at age six. Further aspects of the study consider questions of a cumulative effect of multiple life events and a possible specificity in the association of life events and child mental health.

In terms of the overall incidence of life events, the parents reported most frequently the birth of a new sibling, the death of a relative (non-parent), or life events related to the physical health of the child. For more than 80 percent of all children, at least one life event was reported. On average, a child had experienced more than two life events prior to school entry. Therefore, the experience of life

events is prevalent already at preschool age. The total number of life events was independent of any demographic variable.

The study showed a highly significant correlation between the number of life events and the number of behavioral and emotional symptoms. This effect was already reported previously for older school children [28, 29]. Therefore, the negative impact of life events on child mental health at preschool age was not unexpected, and is consistent with findings in young children exposed to high emotional stress [8].

The results suggest a major distinction in the impact on child mental health between up to two, and three or more life events. A significantly cumulative effect of multiple life events on child mental health was also reported in earlier studies [13, 33]. The clear evidence of a cumulative effect of multiple life events corresponds to the concept of allostasis and allostatic load [25]. The allostasis concept combines recent neurobiological results on HPA axis dysregulation, endogenous neurotransmitter imbalance, and amygdala hyperactivity with psychopathological development as a result of the long-term effects of adaptation to repeated stressors [35].

Due to the explorative nature of the factor analysis, the interpretation of the derived factors, the "family-change-factors", should be undertaken with caution. The coherence in content of the six factors is especially striking and confirms the assumption that some life events are interrelated.

Further analyses of the study examined the specificity of specific single life events and family-change-factors on child mental health, independently of any cumulative effects of multiple life events. Thus, the examination of specificity was limited to children who had experienced only one particular life event and to children who had experienced such events of only one particular family-change-factor. In all, the effects of specific single life events on child mental health at preschool age are small and the most frequent family-change-factors, "Child's health problems" (factor 2) and "Family members" (factor 6), were not correlated with the prevalence of child mental health problems.

Specificity hypotheses posit life events involving separation with internalizing symptoms and life events involving conflict with externalizing symptoms [26]. As shown in the Tables 3 and 5 only two out of 17 life events and two out of six family-change-factors were associated with significantly increased CBCL scores. The significant family-change-factor "Parents' job" including the significant life event "Parent restarted work" was associated with internalizing and externalizing problem behavior. The life event "Move of best friend" and the family-change-factor "Move", both involving separation, were associated with significantly increased internalizing symptoms only.

Not all separation events, even separation from important family members, were associated with increased internalizing problem scores. "Separation", "divorce", and "remarriage" of parents had no significant effect on CBCL problem scores. This result is in part consistent with findings by Amato [2], who reported negative effects of separation and divorce in older children at school age, but not in very young children. In addition, negative effects of separation and divorce on mental health at preschool age were found only, when the separation or divorce was combined with parental conflicts or social adversities [30].

Significantly lower scores of CBCL total scale and externalizing problem scale for "Death of a parent" and the associated family-change-factor "Parents' health" were unexpected. This result is in contradiction to other findings [6, 27], but is limited by the small number of appropriate cases in the present study. Moreover, the result must be seen in the light of lower parental reports of child's symptoms compared to self-reports, as known from the extant literature about childhood bereavement following parental death [10].

Limitations

Given the large number of subjects of this population-based study, the symptom checklist approach offered useful information about child mental health status but lacked the specificity and depth which structured psychiatric interviews could provide. Due to the age of the children, no self-report was possible and parental reports had to be used.

Due to the cross-sectional design, the assessment of life events had to cover a time span of almost 6 years and the data may be subject to recall bias. In addition, the life event questionnaire included a wide range of events, but does not record the number of events per category. This could possibly limit its validity and allow for underestimation of the real number of events. Further research, especially prospective longitudinal studies, is needed to control for temporal effects on the impact of life events at early childhood.

Conclusion

The quantitative effect of life events was found to be much more important for child mental health than qualitative aspects. The accumulation of three and more life events had a highly significant effect on child mental health.

Subjective perception of predictability and controllability are important distinctions between life events in older children, adolescents, and adults. Predictability and controllability of life events are central in understanding their impact on mental health [28]. From our study, preschool children should be seen as being highly dependent on parental coping abilities and must be regarded as vulnerable, when exposed to parental stress, conflicts, and tensions. Including measures of parental coping abilities and their influence on stress would be helpful in further studies on preschool children.

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