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## Developing e-health applications to promote a patient-centered approach to medically unexplained symptoms

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**CHAPTER 7**

**7**

# **Family disruption increases functional somatic symptoms in late adolescence: the TRAILS study.**

A van Gils, KAM Janssens & JGM Rosmalen.

**ABSTRACT**

**Background:** Functional somatic symptoms (FSS) are physical symptoms that cannot be (fully) explained by organic pathology. FSS are very common among children and adolescents, yet their etiology is largely unknown. We hypothesize that (a) the experience of family disruption due to parental divorce or parental death increases FSS in adolescents; (b) symptoms of depression and anxiety contribute to the relationship between family disruption and FSS; (c) girls are more vulnerable for these effects than boys.

**Methods:** Data were obtained from the prospective population cohort of Dutch adolescents of the Tracking Adolescents' Individual Lives Survey (N = 2230) aged 10-12 years at baseline. FSS were assessed using the Somatic Complaints subscale of the Youth Self-Report. Parental divorce and parental death were assessed with self-reports. Both outcome and predictors were assessed during three assessment waves over the course of five years. Linear mixed models were used to investigate associations between both types of family disruption and FSS.

**Results:** An interaction with age was found for parental divorce ( $B = 0.01$ ,  $p = .02$ ) and parental death ( $B = 0.03$ ,  $p = .04$ ), indicating that the influence of family disruption on FSS increases during adolescence. This relationship seems to be partly explained by symptoms of depression and anxiety. No gender differences were found with regard to the effects of family disruption on FSS.

**Conclusions:** Family disruption is associated with an increased level of FSS in late adolescence in both genders. This relationship is partly explained by symptoms of depression and/or anxiety.

## INTRODUCTION

Functional somatic symptoms (FSS) are physical symptoms that cannot be (fully) explained by organic pathology. FSS are very common, especially among children and adolescents. Approximately 20-25% of children suffer from FSS, with abdominal pain, headache and musculoskeletal pains being the most common complaints (1-4). Originally, FSS were thought to be a physical expression of emotional distress. Currently, the development of FSS is considered to be a multifactorial process, in which biological, psychological and social factors play a role (5, 6). Different aspects of psychosocial stress in relation to FSS have been studied and it seems that FSS are associated with a stress sensitive temperament, adverse life events, altered physiological response to stressors, and inadequate coping (5-7). For children, family disruption due to parental divorce or parental death is usually highly stressful (8) and several previous studies suggest a connection between family disruption and FSS. A study of 1488 Malaysian schoolchildren showed that children who had recently lost a parent through death showed a significantly higher prevalence of recurrent abdominal pain than controls (29% versus 10%) (9). Divorce or separation of parents was not significantly related to recurrent abdominal pain in this study, but other studies have found an association between parental divorce and other types of FSS. Adolescents with tension-type headache are more likely to have divorced parents than adolescents with migraine or adolescents without headache (10, 11). Frequent back pain has also been associated with recent parental divorce among early adolescents (12). However, most of these studies are limited by their clinical populations, cross-sectional design or the fact that only one specific symptom was assessed.

Apart from these limitations, previous studies did not focus on possible mechanisms underlying the association between family disruption and FSS. One of the possibilities is a contributing effect of depression and anxiety. Family disruption is associated with increased levels of depression and anxiety in adolescents (13, 14). In turn, symptoms of depression and anxiety are risk factors for the development of FSS (15). Finally, previous studies did not take potential gender differences into account in the association between family disruption and FSS. Previous research has demonstrated that girls tend to have more internalizing problems following family disruption, whereas boys tend to react with externalizing behaviors (13, 16). Adolescent girls have been shown to be more susceptible to depressogenic effects of stressful life events than boys (17), particularly with regard to interpersonal stressors like parental divorce (18, 19). Since FSS are strongly associated with internalizing problems like depression and anxiety (15), similar gender differences might be expected for the effect of family disruption on FSS.

The primary aim of this study is to examine the influence of family disruption on the level of FSS during adolescence. We hypothesize that (a) parental divorce and parental death

increase the level of FSS in adolescents; (b) symptoms of depression and anxiety contribute to the relationship between family disruption and FSS; (c) girls are more vulnerable to the effects of family disruption on FSS than boys. The influence of parental divorce and parental death on FSS was investigated in a prospective population based cohort study of Dutch adolescents ( $N = 2230$ , ages 10-12 at baseline) with a follow-up period of approximately 5 years.

## METHODS

### Sample and Procedure

This study is part of the Tracking Adolescents' Individual Lives Survey (TRAILS), a prospective cohort study which aims to investigate the development of physical and mental health of Dutch adolescents into adulthood. Approval by the Dutch Central Committee on Research Involving Human Subjects was obtained for the study. In the present study data from the first three assessment waves were used with an average follow-up period of 5.2 years. The first assessment wave (T1) ran from March 2001 to July 2002, the second assessment wave (T2) ran from September 2003 to December 2004 and the third assessment wave (T3) ran from September 2005 to August 2008. The average age of participants at these assessment waves was 11.1, 13.6 and 16.3 years, respectively.

Subjects were recruited from five municipalities in the North of the Netherlands, including both urban and rural areas. Municipalities were requested to provide names and addresses of all inhabitants born between 1st October 1989 and 30th September 1990 (first two municipalities) or 1st October 1990 and 30th September 1991 (last three municipalities). A total number of 3483 names came up. Simultaneously, primary schools (including schools for special education) within these municipalities were asked to participate in TRAILS. Of the 135 schools that were approached, 122 (90.4%) agreed to co-operate. Given the co-operation of their school, children were approached with the request to take part in TRAILS. Children that were incapable to participate due to mental retardation, serious physical illness or handicap were excluded from the study, as well as children without a Dutch-speaking parent or guardian. After exclusion, 2230 children (76% of eligible children) were enrolled in the study. Written informed consent was given by parents and adolescents. A detailed description of the sample selection can be found elsewhere (20). General characteristics of the study sample are shown in Table 1.

### Measures

*Functional Somatic Symptoms.* In order to assess FSS at baseline and follow-up, the Somatic Complaints subscale of the Youth Self-Report (YSR) (21) was used. The YSR is known to have good cross-cultural validity (22). The Somatic Complaints subscale consists of nine items,

referring to physical complaints without a known medical cause (pain, headache, nausea, eye problems, skin problems, abdominal pain and vomiting) or without an obvious reason (dizziness and overtiredness). For each item, participants could indicate if they had experienced this complaint 'never' (= 0), 'sometimes or a bit' (= 1), or 'often or a lot' (= 2). Factor analysis from a previous study showed that two items (eye problems and skin problems) had low factor loadings (23). Therefore, these items were excluded. The remaining seven items showed acceptable internal consistency ( $\alpha$  at T1: .76; at T2: .77; at T3: .75). Scores of these seven items were added up and divided by seven to form a mean item score. This mean item score (with a minimum of 0 and a maximum of 2) was used as a continuous variable in statistical analyses.

*Family Disruption.* During the first assessment wave, one of the parents or guardians was interviewed (preferably the mother, 96%). In this interview, they were asked whether their child had experienced parental divorce and/or the death of a parent. During the second assessment wave, adolescents filled in a questionnaire about events that had happened since the first assessment wave. Among these events were parental divorce and parental death. During the third assessment wave, the Event History Calendar was used to assess family disruption. The Event History Calendar is an interview about events that occurred in the past five years. Subjects could indicate whether they had experienced the event (e.g. parental divorce or parental death; yes/no) and when. In order to assess family disruption since the second assessment wave, events that occurred before the second assessment wave were excluded.

*Socioeconomic Status.* Because lower SES increases the chance of family disruption (24, 25) and is also associated with a higher level of FSS in children (26, 27), SES was added as a confounder. SES was assessed at baseline using the following parent-reported indicators: family income, educational level of both parents, and occupational level of both parents, using the International Standard Classification of Occupations (28). After standardization, these five indicators were combined into one SES measure, which showed good internal consistency ( $\alpha = .84$ ) (29).

*Depression.* The Affective Problems subscale of the YSR was used to measure symptoms of depression at T1-T3. This subscale contains 13 items: anhedonia, crying, self-harm, eating problems, feelings of worthlessness, guilt, overtiredness, sleeping problems (3 items), suicidal ideation, lack of energy, sadness. The item 'overtiredness' was excluded from the scale to prevent overlap with the Somatic Complaints subscale. The scale showed adequate internal consistency ( $\alpha$  at T1: .69; at T2: .74; at T3: .75).

*Anxiety.* The Revised Child Anxiety and Depression Scale (RCADS) was used to measure symptoms of anxiety at T1-T3. The RCADS contains 37 items referring to anxiety and covers a wide range of anxiety disorders: social phobia (9 items), panic disorder (9 items), separation anxiety disorder (7 items), generalized anxiety disorder (6 items), and obsessive compulsive disorder (6 items). The item 'dizziness without an obvious reason' was excluded to prevent overlap with the FSS scale. A scale was created by averaging the remaining 36 items, which showed excellent internal consistency during all assessment waves ( $\alpha$  at T1: .91; at T2: .93; at T3: .92).

### **Statistical Analysis**

SPSS® 20.0 for Windows was used to perform all statistical analyses. Linear mixed models (LMMs), also called multilevel models or hierarchical linear models were used to examine the influence of parental divorce and parental death on the level of FSS during adolescence. This statistical technique is often used for longitudinal data, since it does not hold the assumption that observations in datasets are independent of each other. LMMs are designed to handle datasets in which observations have a nested, multilevel structure, such as repeated measurements (level 1) nested within individuals (level 2). Furthermore, LMMs allow the consideration of both time-invariant and time-varying factors as predictors of a continuous dependent variable. Another major advantage of LMMs is their ability to analyze datasets with different numbers of observations per subject or unequal time intervals between observations. LMMs estimate "fixed effects", which represent the average effects across individuals, and "random effects", which indicate the extent to which individuals vary around these average effects (30).

The first model was designed to test the hypothesis regarding the influence of family disruption on FSS. Parental divorce and parental death were entered as fixed effects, as was SES as a possible confounder. A random intercept was included to allow the intercept to differ between subjects. Outcome variable was the FSS mean item score at baseline and follow-up (T1, T2 and T3). Models with different error-variance structures were specified and the model with the best fit according to the Akaike Information Criterion was chosen as the final model. Maximum likelihood was used for model estimation. In order to examine whether the relationship between family disruption and FSS changed over time, age and the interactions parental divorce\*age and parental death\*age were added to the model. Because the age ranges during the three assessment waves cover all ages between 10 and 17, age could be used as a continuous variable. Before adding the interaction terms, age was centered at 13.48, which is the mean age of the sample over all three assessment waves. As a result, main effects of parental divorce and parental death refer to 13.48 years olds. If the two-way interactions between the events (parental divorce or parental death) and age were significant, the analyses were repeated successively centering age at 10-17 years. In this



procedure, the main effect of parental divorce or parental death can be interpreted as the effect for the particular age at which the age variable is centered. STATA 11 was used to create graphs depicting the predicted values of FSS for adolescents of different ages with and without a history of parental divorce or parental death.

To test the hypothesis that symptoms of depression and anxiety contribute to the relationship between family disruption and FSS, a second and third model were specified in which depression and anxiety variables were separately added as fixed effects to the first model. A reduction in the size of the effects of parental divorce and parental death on FSS could indicate that symptoms of depression and/or anxiety act as mediators in this relationship (31). These analyses were only performed for the age categories for which parental divorce and parental death showed a significant effect in the first model.

In order to test whether the effects of family disruption on FSS over time were influenced by gender, a fourth model was created in which gender and the interaction terms event\*gender, age\*gender, and event\*age\*gender were added to the first model. If the three-way interactions were significant, prior analyses were stratified by gender. P-values < 0.05 were considered statistically significant.

## RESULTS

### Sample Characteristics

Table 1 shows the characteristics of the study sample at baseline (T1) and follow-up (T2 and T3). A large majority of the study sample consisted of native Dutch adolescents (86.5%). Additionally, several ethnic minorities were represented: 2.1% Surinam, 1.7% Antillean, 1.7% Indonesian or Mollucan, 0.7% Moroccan, 0.5% Turkish. The ethnicity of the remaining 6.8% was not specified.

**Table 1.** General Characteristics of the Study Population.

Characteristic	T1	T2	T3
Subjects (n, % of baseline)	2230	2127 (95.4)	1819 (81.6)
Female subjects (n, %)	1132 (50.8)	1088 (51.2)	952 (52.3)
Age (M, SD)	11.1 (0.6)	13.6 (0.5)	16.3 (0.7)
FSS (M, SD)	0.47 (0.35)	0.39 (0.35)	0.34 (0.34)
Parental divorce (n, %)	469 (21.5)	511 (24.3)	496 (27.3)
Parental death (n, %)	37 (1.7)	49 (2.3)	57 (3.1)

*Note.* FSS = functional somatic symptoms; Youth Self-Report, Somatic Complaints subscale mean item score with possible range between 0 and 2. T1 = baseline; T2 and T3 = follow-up 2.5 and 5.2 years later.

At T1, 21.5% of participants had a history of parental divorce ( $n = 469$ ). Of this group, 94.2% participated at T2 ( $n = 442$ ), which was on average 2.5 years later. During the first follow-up period an additional 69 (3.3%) adolescents faced parental divorce. Of the 511 adolescents with divorced parents at T2, 81.4% participated at T3 ( $n = 416$ ). During the second follow-up period, 75 adolescents experienced parental divorce (4.1%). At T1, 1.7% of participants had lost a parent through death ( $n = 37$ ). Of this group, 86.5% still participated at T2 ( $n = 32$ ). During the first follow-up period, 17 participants experienced parental death (0.8%). Of the 49 bereaved adolescents at T2, 85.7% took part at T3 ( $n = 42$ ). During the second follow-up period, 14 adolescents lost a parent through death (0.8%).

### The Effects of Parental Divorce and Parental Death on FSS

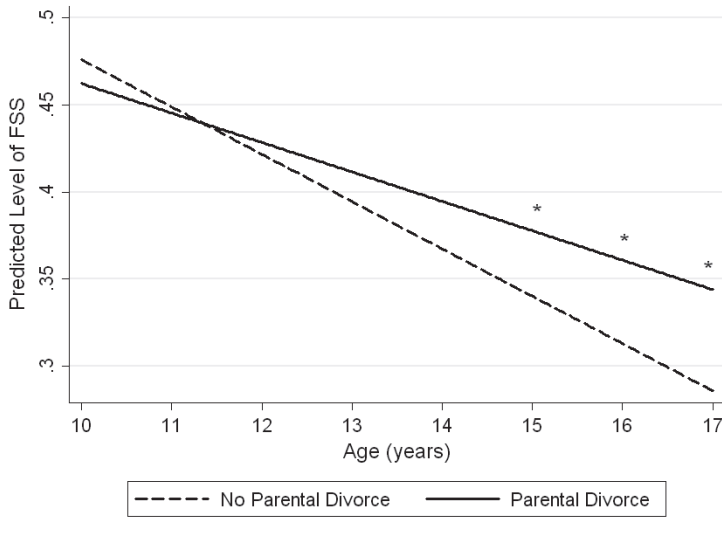
As indicated in Table 2, both parental divorce and parental death showed a significant interaction with age. This means that the effects of parental divorce and parental death on FSS depend on the age of the subjects. Therefore, the effects of parental divorce and parental death on FSS at different ages were assessed by centering the age variable at different ages (10-17). These results suggest that the disadvantageous effect of both types of family disruption on FSS increases during adolescence and becomes significant at age 15 (Figures 1 and 2).

**Table 2.** Linear Mixed Model Predicting the Effects of Parental Divorce, Parental Death, Age and Their Interactions on Functional Somatic Symptoms, adjusted for Socioeconomic Status.

Variables	<i>B</i>	<i>p</i>	95% confidence interval	
			<i>Lower Bound</i>	<i>Upper Bound</i>
Intercept	0.40	<.001	0.38	0.41
SES	-0.03	.001**	-0.04	0.01
Parental divorce	0.02	.23	-0.01	0.04
Parental death	0.04	.30	-0.03	0.11
Age	-0.03	<.001***	-0.03	-0.02
Parental divorce*age	0.01	.02*	0.00	0.02
Parental death*age	0.03	.04*	0.00	0.05

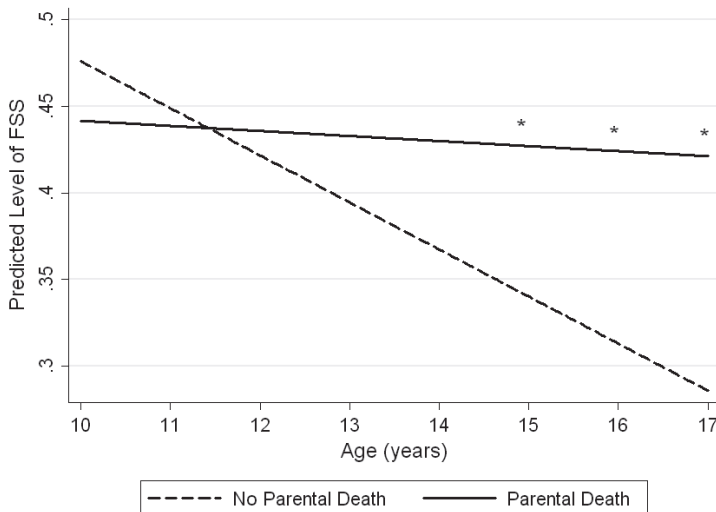
Note. SES = socioeconomic status. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

**Figure 1.** Effect of Parental Divorce on Functional Somatic Symptoms during Adolescence.



Note. Figure based on Linear Mixed Model adjusted for socioeconomic status; FSS = functional somatic symptoms; mean item score of Youth Self-Report Somatic Complaints subscale (0-2); \* =  $p < .05$ .

**Figure 2.** Effect of Parental Death on Functional Somatic Symptoms during Adolescence.



Note. Figure based on Linear Mixed Model adjusted for socioeconomic status; FSS = functional somatic symptoms; mean item score of Youth Self-Report Somatic Complaints subscale (0-2); \* =  $p < .05$ .

### **Contribution of Depression and Anxiety to the Relationship between Family Disruption and FSS**

In order to evaluate the contribution of symptoms of depression and anxiety to the relationship between family disruption and FSS during adolescence, depression and anxiety variables were separately added to the first model. Because prior analyses showed that the effect of parental divorce and parental death on FSS was only significant for ages 15, 16 and 17, these analyses were only carried out for these age categories (tables 3 and 4). When the variable depression was added to the model, the effect of parental divorce on FSS decreased drastically (table 3). The effect of parental death on FSS showed a more discrete decrease (table 4). Adding the variable anxiety to the model hardly changed the effect of parental divorce on FSS (table 3). The effect of parental death on FSS did show a small decrease (table 4).

### **Gender Differences in the Association between Family Disruption and FSS**

Neither parental divorce ( $B = -0.02$ , 95%-CI [-0.07, 0.02]  $p = .35$ ), nor parental death ( $B = -0.01$ , 95%-CI [-0.05, 0.04],  $p = .79$ ) showed a significant three-way-interaction with age and gender. Thus, the relationship between parental divorce or parental death and FSS over time was not significantly different for boys and girls.

## **DISCUSSION**

The results of this study indicate that the influence of family disruption on FSS increases during adolescence. In late adolescence, both parental divorce and parental death were associated with an increased level of FSS. This relationship might be partly explained by an increase in symptoms of depression and/or anxiety. No gender differences were found in the association between parental divorce or parental death and FSS.

There are several important strengths to this study. First, the use of a large population based sample increases generalizability of the results. Furthermore, the longitudinal design enabled studying the influence of age in the association between family disruption and FSS. The multilevel design made it possible to take intra-individual differences into account. Finally, because presentation of FSS is diverse, instead of confining to a single symptom, a cluster of FSS was investigated.

**Table 3.** Effect of Parental Divorce on Functional Somatic Symptoms for Different Ages with and without consideration of Depression and Anxiety.

Age	Model 1: Without Depression and Anxiety			Model 2: With Depression			Model 3: With Anxiety		
	B	p	95% confidence interval Lower Bound Upper Bound	B	p	95% confidence interval Lower Bound Upper Bound	B	p	95% confidence interval Lower Bound Upper Bound
15	0.03	.03*	0.00 0.06	0.01	.68	-0.02 0.03	0.03	.04*	0.00 0.05
16	0.04	.01*	0.01 0.07	0.01	.42	-0.02 0.04	0.04	.01*	0.01 0.07
17	0.05	<.01**	0.02 0.09	0.02	.28	-0.02 0.05	0.05	<.01**	0.01 0.08

Note: Results of Linear Mixed Models adjusted for socioeconomic status. \* p<.05. \*\* p<.01.

**Table 4.** Effect of Parental Death on Functional Somatic Symptoms for Different Ages with and without consideration of Depression and Anxiety.

Age	Model 1: Without Depression and Anxiety			Model 2: With Depression			Model 3: With Anxiety		
	B	p	95% confidence interval Lower Bound Upper Bound	B	p	95% confidence interval Lower Bound Upper Bound	B	p	95% confidence interval Lower Bound Upper Bound
15	0.08	.04*	0.00 0.15	0.04	.18	-0.02 0.11	0.05	.13	-0.01 0.11
16	0.10	.01*	0.02 0.18	0.07	.06	0.00 0.14	0.08	.04*	0.00 0.15
17	0.13	<.01**	0.03 0.22	0.09	.03*	0.01 0.18	0.10	.02*	0.02 0.19

Note: Results of Linear Mixed Models adjusted for socioeconomic status. \* p<.05. \*\* p<.01.

When interpreting the results of this study, the following limitations should be taken into account. First, it is not certain that scores on the Somatic Complaints subscale of the YSR truly represent FSS, because organic causes were not excluded by means of a medical examination. Nonetheless, the outcome variable is believed to represent an adequate measure of FSS, because the Somatic Complaints subscale clearly inquires symptoms 'without obvious reason' or 'without a known medical cause'. Also, a factor analysis indicated that the seven items that were combined to measure FSS represent one underlying construct. This suggests that these items represent one underlying general trait. A second limitation is the fact that the assessment of family disruption was not identical during the three assessment waves. At T1, parents were interviewed, at T2 participants filled in a questionnaire and at T3 participants were interviewed. However, a great discrepancy in outcomes is not to be expected, because the events probably had a great impact on parents as well as adolescents and therefore both will presumably be able to remember them. Third, no information on the cause of parental death was available. Previous research shows that parental death substantially increases the risk for depression and substance use disorders in offspring, regardless of the cause of parental death (i.e. disease, accident or suicide) (32, 33). Whether the cause of parental death influences the level of FSS in bereaved offspring, is not known. Adolescents whose parents died from a disease compared to other causes might experience more FSS, because increased health anxiety might result in increased body focusing in these adolescents. Unfortunately, data of the current study were not sufficient to test this hypothesis. Finally, our linear mixed models allowed exploring the contribution of depression and anxiety in the association between family disruption and FSS, but this approach did not allow testing whether these factors were significant mediators in this association. Alternatively, depression and anxiety could act as confounders, increasing the risk of both family disruption and FSS. However, literature provides more support for an effect of family disruption on adolescent's psychopathology than vice versa.

The findings of this study indicate that both parental divorce and parental death are associated with an increased level of FSS in late adolescence. Literature on the influence of parental death on FSS is very scarce, because the prevalence of parental death is relatively low and the small sample size of most previous studies on negative life events and FSS probably did not yield enough power to properly study this. For example, in a case-control study of children with idiopathic headache, parental death was not more frequent in children with tension-type headache than in healthy controls, but parental death was reported by only 3 out of 190 children (1.6%) (10). The only exception is a large school-based study examining the influence of negative life events on recurrent abdominal pain, which showed that children who had recently lost a parent through death (21 out of 1404 children; 1.5%) showed a higher prevalence of abdominal pain (9). The role of age was not examined in this previous study, but results concern children aged 9-15 years. This marks a difference with

the current study, in which the association between parental death and FSS was only found for adolescents aged 15-17 years.

Previous studies on the influence of parental divorce on FSS have shown mixed results. Two studies showed no significant association between parental divorce and recurrent abdominal pain (9, 34). Unlike recurrent abdominal pain, other types of FSS have been associated with parental divorce. Parental divorce has been shown to be more prevalent among adolescents with functional headache (10, 11) as well as back pain (12). Inconsistencies in the results of previous studies might be explained by the specific type of symptom that was studied. Abdominal pain is mainly reported by young children, while the incidence of headache and back pain increases during adolescence (35, 35, 36). The current study showed that parental divorce was only associated with an increased level of FSS in late adolescence. The combination of these two elements might explain why no association was found between parental divorce and abdominal pain in previous studies, since abdominal pain is less important in (late) adolescence.

The findings of this study suggest that the relationship between parental divorce and FSS might be partly explained by symptoms of depression. Symptoms of depression and anxiety both seem to explain part of the relationship between parental death and FSS. It seems obvious that both types of family disruption are associated with a considerable degree of stress and therefore might cause an increase in symptoms of depression. Anxieties concerning separation and death are common in bereaved children (5). This may explain why anxiety specifically mediates the relationship between parental death and FSS and not parental divorce. Exploratory analyses on sub dimensions of anxiety suggest that the association between parental death and FSS is indeed explained by separation anxiety, but generalized anxiety seems to play a far bigger role (results not shown). These post hoc analyses fit our findings on depressive symptoms being more important than anxiety symptoms, since generalized anxiety has been shown to be part of an underlying anxious-depressed dimension, while other types of anxiety are part of a more specific anxiety dimension (37).

The contribution of symptoms of depression and anxiety could also explain why the association between family disruption and FSS was only found in late adolescence. Symptoms of depression and anxiety show a sharp increase during adolescence and young adulthood (17). Possibly, the increased experience of symptoms of depression and/or anxiety could lead to an increased experience of FSS as well. Our current statistical approach does not exclude that depression and anxiety are confounders that increase the risk of both family disruption and FSS. However, this scenario seems less likely, given the literature described above.

The current study is the first to have examined potential gender differences in the relationship between family disruption and FSS. Previous studies on depression following parental divorce, one of which in the same population as the current study, have shown that the influence of parental divorce on depressive symptoms is stronger in girls than in boys (18, 19). However, the current study did not yield such gender differences for FSS.

By integrating several important factors like stressful life events, symptoms of depression and anxiety, age and gender this study contributes to a better understanding of the development of FSS in adolescents. Results of this epidemiological study suggest that parental divorce and parental death are risk factors for the development of FSS during adolescence. The association between family disruption and FSS seems to be partly explained by symptoms of depression and anxiety. When confronted with adolescent patients with FSS, clinicians should enquire about family conditions and assess symptoms of depression and anxiety. This might provide useful information that could contribute to an explanatory model and guide treatment. Further research is necessary to examine which other factors contribute to the relationship between family disruption and FSS. Possibly, family disruption sets in motion a chain of other stressful life events. Previous research has shown that FSS are associated with a high number of negative life events in adolescents (38-40). Another possible mechanism underlying the association between family disruption and FSS is a potential decrease in SES following family disruption. Although SES was included as a confounder, SES was only measured at baseline in this study, which made it impossible to study the relationship between family disruption, SES and FSS over time.

## **CONCLUSIONS**

In summary, the experience of family disruption due to parental divorce or parental death increases the level of FSS in late adolescence, independent of gender. This association might be partly explained by an increase in symptoms of depression and/or anxiety.



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