

Sex differences in the association between childhood experiences and adult depression

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ABSTRACT

Background. In the present paper, sex differences in the association between adult depression and childhood experiences were examined.

Methods. The study series of the Finnish UKKI Study consisted of a population sample of 501 men and 499 women. Information concerning childhood experiences was gathered retrospectively in a baseline survey carried out in 1969–72. After the initial phase, the mental health of the subjects was evaluated by interviews, questionnaires and register data at the 5-year follow-up (1974–6) and at the 16-year follow-up (1985–7).

Results. Twelve per cent of men and 21% of women had suffered from depression during the 16-year follow-up period. A disturbed mother–child relationship and neurotic symptoms in childhood were associated with depression in women but not in men in the logistic model that included gender interaction. In separate analyses by gender several childhood factors showed statistically significant associations with depression in women but only a few in men.

Conclusions. The finding suggests that childhood experiences are more highly predisposing factors to depression in women than in men.

INTRODUCTION

Adverse experiences in childhood raise the risk for depression in adult life (Brown & Harris, 1993). Childhood psychiatric disorders and psychiatric symptoms, especially, have been found to be associated with depression in adulthood (Rodgers, 1990; Harrington *et al.* 1993; Caspi *et al.* 1996). Many of the earlier studies have focused on the effects of childhood separation. Parental divorce – but perhaps not parental death – has been found to have an association with later depression in adulthood (Tennant, 1988; Parker, 1992). It has been emphasized that the separation itself may not be the significant factor, but rather the consequences of the separation (Rutter, 1994). In

the study conducted by Harris *et al.* (1986), lack of care after the separation was the most important risk factor predisposing for later depression. Overall, individuals with a history of depression report their parents as being less caring and more over-protective than do controls (Mackinnon *et al.* 1993). Physical and sexual abuse in childhood has been found to predict strongly depression in adulthood (Bifulco *et al.* 1991; Brown & Anderson, 1991; Mullen *et al.* 1993).

The increased risk of depression in women has been well documented in epidemiological studies in the Western industrialized world. The prevalence of depression has been found to be about twice as high in women as in men (Smith & Weissman, 1992). In recent studies the same phenomenon has been found in South America (Andrade *et al.* 1996; Posada & Torres, 1996) and in Turkey (Dogan *et al.* 1996). No good

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explanation for this common epidemiological finding has been found as yet (Smith & Weissman, 1992). Neurotic symptoms have an earlier onset in women than in men (Aro *et al.* 1987) and the gender gap in depression grows in adulthood (Mirowsky, 1996).

One possible explanation for the gender gap in the prevalence of depression might be that the two genders tend to react differently to adverse childhood conditions. There is only a limited number of studies in literature that deal with gender differences in associations between childhood experiences and depression. Some researchers have stated that women are more sensitive to the influence of childhood separation than men (McLeod, 1991; Rodgers, 1994). In this study our aim was to determine possible sex differences in the association between adult depression and childhood experiences in a Finnish population sample.

METHOD

The study series of the Uusikaupunki–Kemijärvi Study (UKKI) Study consisted of 1000 subjects chosen from two small towns and the surrounding countryside in Finland. Five hundred subjects were recruited from the area of Uusikaupunki in Southern Finland, and another 500 from the area of Kemijärvi in Finnish Lapland. The subjects, born between 1905 and 1954, were randomly selected from the population registers in 1969. The sample consisted of 501 men and 499 women (Väisänen, 1975). For the present analyses the subjects were divided into three birth cohorts (Table 1).

The mental health of the subjects has been followed for 16 years. The baseline survey was conducted in 1969–71, the 5-year follow-up in

1974–6 and the 16-year follow-up in 1985–7. Of the original population sample of 1000 persons, aged 15–64 years, nine had died before the baseline survey started, and 151 died during the 16-year follow-up period (Lehtinen *et al.* 1991). Of the deceased, 98 were men and 62 women. In the oldest cohort, 40.0% (68/170) of men and 30.1% (51/169) of women died during the 16-year follow-up period.

The method of the first phase of the UKKI study included a psychiatric interview of the subjects, the Cornell Medical Index (CMI) health questionnaire (Brodman *et al.* 1956) and the two psychological tests by Zulliger (1954) and Wartegg (1953) (Väisänen, 1975). A follow-up questionnaire was used at the 5-year follow-up study, also the CMI health questionnaire; these were sent to subjects by post. If the subject did not respond to the questionnaire, or if, on the basis of the subjects's reply, there had been a change in his/her mental health condition, the subject was invited to a psychiatric interview (Lehtinen & Väisänen, 1981). At the 16-year follow-up, every subject was interviewed personally, if possible. The interview included the Present State Examination (Wing *et al.* 1974). In addition, the subjects filled out the CMI health questionnaire and went through psychological tests similar to those in the baseline. In all study phases, register data were widely collected from various sources (Lehtinen *et al.* 1991). In total, 980 subjects participated in the baseline survey, 925 in the 5-year follow-up and 747 in the 16-year follow-up phase (Fig. 1). All data collected during each phase of the study were used to obtain correct psychiatric diagnoses.

The data on the subjects' childhood experiences were obtained retrospectively in the baseline survey using a semistructured interview. Altogether 21 different childhood experiences were recorded. Neurotic symptoms in childhood, which were regarded as one of the childhood experiences, meant long-lasting nocturnal nightmares and wandering, bed-wetting, long-lasting nail-biting and different simple and other phobias. Information on at least one childhood experience was given by 963 subjects. The percentages of potentially disturbing childhood experiences in the sample are presented in Table 2. In the case of childhood separation classes, parental divorce and other separation were dealt with together, as there were only 18 parental

Table 1. *The original sample of the UKKI Study*

Birth cohort (age at the baseline survey)	Men	Women	All
1905–21 (48–64 years)	170	169	339
1922–38 (31–47 years)	171	170	341
1939–54 (15–30 years)	160	160	320
1905–54 (15–64 years)	501	499	1000

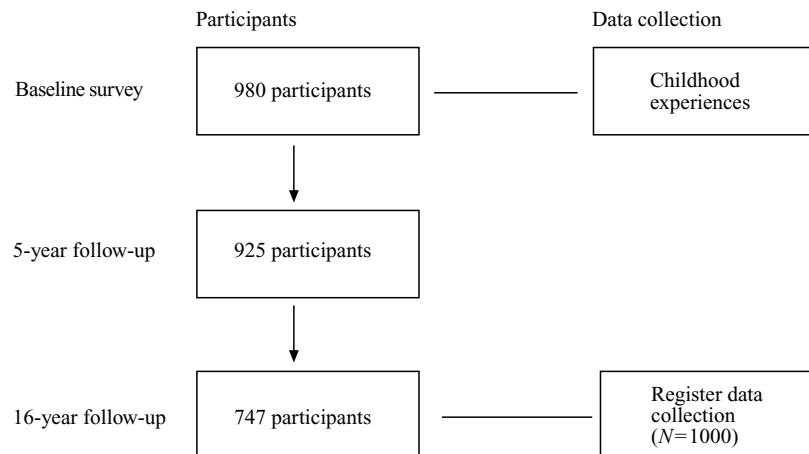


FIG. 1. Data collection and participants in the UKKI Study.

Table 2. Occurrence (%) of potentially disturbing childhood experiences in men and women

	Men %	Women %	All %	Gender difference P
Disturbed				
Mother-child relationship	15	16	16	NS
Father-child relationship	22	18	21	NS
Parental relationship	21	25	23	NS
Relationship between siblings	7	8	8	NS
Atmosphere at home	19	19	19	NS
Separation before the age of 16 years	25	29	27	NS
Parental death	20	22	21	NS
Other separation	5	7	6	NS
Being an only child	5	6	6	NS
Large family (≥ 7 children)	35	35	35	NS
Low social class of father	21	25	23	NS
Parental mental disorder	16	16	16	NS
Neurotic parent	4	5	4	NS
Suicidal parent	2	1	1	NS
Parental alcoholism	9	9	9	NS
Psychotic parent	4	4	4	NS
Born extramaritally	5	5	5	NS
Childhood environment changed	26	30	28	NS
Few playmates	24	32	29	**
Corporal punishment used	68	52	60	***
Poor performance at school	28	18	23	***
Neurotic symptoms in childhood	57	51	55	NS
One symptom	31	29	30	NS
Many symptoms	26	22	25	NS
Obstetric complication	7	8	8	NS
Serious somatic illness or often sick in childhood	25	28	27	NS

** $P < 0.01$; *** $P < 0.001$; NS, not significant.

divorces, which is insufficient for statistical analysis. There were only a few differences in the childhood experiences between men and women.

In their childhood, the men had been physically punished more often and they had been less successful at school than the women. In the female group, the women had more often had only a few playmates compared with the men.

The UKKI Study used a psychiatric classification that was based on ICD-8. All subjects (also those deceased) were included. The subject was defined as having had a depressive episode during the follow-up period if he/she was diagnosed as suffering from psychotic depression (296.00, 296.20 or 298.00) or neurotic depression (300.40 or 300.41) in at least one of the study phases; or if there was a register diagnosis of psychotic/neurotic depression available. Register data including files of the National Social Insurance Institution, health centres, mental health centres, and discharge and patient census registers of psychiatric hospitals were collected in the 16-year follow-up phase. This means that the rates in the study can be regarded as 16-year period prevalences of depression in the sample. The follow-up period was shorter than 16 years for the deceased subjects. Psychotic depression was not dealt with separately as there were only a few cases of psychotic depression.

Statistical analysis was performed using SAS software (SAS, 1985). A logistic regression model with gender, age and childhood experiences, one at a time, as predictors for depression was used. A term for interaction between gender and childhood factor was included to compare the effect size for men and women. In the case of no interaction, the age-adjusted prevalences were

calculated according to the model. Prevalences connected to factors with interaction with gender were calculated separately for men and women. In addition, separate age-adjusted prevalences for men and women were reported. All univariately significant ($P < 0.05$) childhood factors were analysed by multivariate logistic regression analysis. The objective was to determine which factors had individual power in explaining adult depression while the effects of other factors were controlled. Relative risks and their 95% confidence intervals were calculated for significant childhood experiences.

RESULTS

The 16-year period prevalence of depression for all subjects was 16.1%. The prevalence for deceased subjects was 13.1% (12.2% for men and 14.5% for women) and for those still alive at the 16-year follow-up phase 16.7% (11.4% for men and 21.5% for women). The prevalences between the deceased subjects and those alive did not differ statistically significantly.

The prevalence of depression was twice as high in women as in men (Table 3). The sex difference was most prominent in the youngest age cohort in which depression was four times more frequent in women than in men. In the oldest cohort depression was approximately as frequent in men as in women.

Associations between childhood factors and adult depression are presented in Table 4. Of the 21 separate childhood factors, nine turned out to be associated with adult depression in either

men or women. In the logistic model involving the interaction term, a disturbed mother-child relationship and neurotic symptoms in childhood had statistically different associations with depression in men and women. In the separate model in which prevalences were calculated separately for men and women, there were only two almost significant ($P < 0.05$) childhood experiences for male depression, while there were eight significant ($P < 0.01$) factors for female depression.

In the logistic regression analyses including all predictors, women had a 2.6 times higher relative risk for depression than men. In the middle and oldest age-groups the risk was 2.6–2.8 times higher than in the youngest age-group. The childhood factors which appeared to increase the risk for depression significantly were neurotic symptoms in childhood and a neurotic parent, even when controlling for the other factors (Table 5).

DISCUSSION

The results of this study suggest that childhood experiences are more highly predisposing factors to depression in women than in men. The occurrence and quality of childhood experiences did not differ much between men and women. Differences in the childhood experiences themselves did not explain the difference of the prevalence rates of depression between men and women. This was also supported by the result of the logistic regression analysis. Gender was a significant factor in the analysis, which means that the significant childhood experiences themselves did not explain the prevalence difference between the sexes. In the analyses using separate, age-adjusted prevalences of depression, many childhood experiences were associated with depression in women but only a few in men. This was contradictory to some degree with the interaction model. In the interaction model, only a disturbed mother-child relationship and neurotic symptoms in childhood showed an association with depression in women but not in men. Due to the different base rates of depression for men and women and the consequently small frequencies in some risk factor categories, these results must be interpreted with caution.

Table 3. A 16-year prevalence of depression in the UKKI Study in men and women in the three age cohorts

	Age at 16-year survey			All	Difference <i>P</i>
	31–46 years %	47–64 years %	65–80 years %		
Men	3.8	12.9	17.7	11.6	***
Women	15.0	24.1	22.5	20.7	*
Difference (<i>P</i>)	***	**	NS	***	

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; NS, not significant.

Table 4. Age-adjusted prevalence of depression according to childhood experiences in men and women†

	Interaction ¹ <i>P</i>	One model ²		Separate models ³	
		Men %	Women %	Men %	Women %
Disturbed mother-child relationship					
No		—	—	12	18
Yes	0.023	—	—	10	34
<i>P</i>			—	NS	**
Disturbed father-child relationship					
No		10	19	11	19
Yes	0.098	17	31	14	31
<i>P</i>			**	NS	**
Disturbed parental relationship					
No		10	17	10	18
Yes	0.48	18	30	16	32
<i>P</i>			***	NS	**
Disturbed relationship between siblings					
No		11	19	11	20
Yes	0.45	24	38	17	41
<i>P</i>			***	NS	**
Disturbed atmosphere at home					
No		9	17	10	18
Yes	0.45	21	35	19	37
<i>P</i>			***	*	***
Neurotic parent					
No		11	19	12	19
Yes	0.18	30	45	11	53
<i>P</i>			***	NS	***
Parental alcoholism					
No		11	19	12	19
Yes	0.36	22	35	18	42
<i>P</i>			**	NS	**
Neurotic symptoms in childhood					
No		—	—	10	13
Yes	0.035	—	—	12	29
<i>P</i>			—	NS	***
Serious somatic illness or often sick in childhood					
No		10	18	10	19
Yes	0.42	16	27	17	25
<i>P</i>			**	*	NS
Separation before age of 16 years					
No		11	19	11	20
Parental death	0.29	13	22	13	18
Other separation		19	31	31	22
<i>P</i>			NS	NS	NS

† Statistically significant childhood experiences and childhood separation are included in the table: * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; NS, not significant.

¹ Significance of the interaction between childhood experience and sex in logistic regression model.

² Logistic regression model with no interaction term.

³ Age-adjusted prevalences separately for men and women.

A retrospective interview was used in this study to obtain information on the subjects' childhood. Prospective studies have in general been found to be more reliable than retrospective (Robins *et al.* 1985). The recollection of old experiences may be of particular difficulty (Bifulco *et al.* 1994). Some studies have been

performed that estimate the recall bias of childhood information (Finlay-Jones *et al.* 1981; Wolkind & Coleman, 1983; Robins *et al.* 1985). Their results have, however, been contradictory. Robins *et al.* (1985) found that mentally healthy subjects had more often forgotten negative childhood experiences than subjects with a

Table 5. Relative risk (RR) of depression in the logistic regression analysis†

	RR (95% CI)
Sex	
Female	2.6 (1.9–3.9)
Male	1.0
<i>P</i>	***
Birth cohort	
Oldest	2.8 (1.6–4.8)
Middle	2.6 (1.5–4.5)
Youngest	1.0
<i>P</i>	***
Neurotic parent	
Yes	2.4 (1.1–5.2)
No	1.0
<i>P</i>	*
Neurotic symptoms in childhood	
Yes	2.1 (1.4–3.3)
No	1.0
<i>P</i>	***

† Statistically significant childhood experiences only are shown: * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

psychiatric disorder. Brewin *et al.* (1993) stated that there is little reason to link psychiatric status with a less reliable or less valid recall of earlier experiences. In this study it is quite difficult to estimate the effect of recall bias on the results.

Our material represented two small towns in Finland. The 16-year period prevalence of depression was 16% in this study. This prevalence is in the same range as the results of most epidemiological studies on the life-time prevalence of depression (Smith & Weissman, 1992). In the present study the prevalence of depression in those alive at the 16-year follow-up phase was higher than the prevalence in the deceased subjects. This is obviously due, at least partly, to the fact that the follow-up period of the deceased was shorter than those who were alive.

The 16-year period prevalence of depression was 12% in men and 21% in women in this study. The prevalence of depression was thus about twice as high in women as in men. This result is similar to that in many other population studies (Smith & Weissman, 1992). The sex difference in the prevalence of depression was highest in the youngest (31–46 years) age-group, and decreased toward the older cohorts. This finding is similar to that of other researchers (Bebbington *et al.* 1996; Mirowsky, 1996).

In this study, a disturbed mother–child re-

lationship was a more important risk factor for depression to females and males. Alanen and coworkers (1966) have emphasized the importance of a good relationship with the parent of the same sex in the cases of neurotic disorders. In present study, however, a disturbed father–child relationship was not a predictor for later depression in males. About 50% of daughters of ‘neurotic parents’ developed depression later on. Most neurotic parents may have had neurotic depression. Depression has been found to cumulate in certain families (Nurnberg & Gershon, 1992).

One of the important findings in the study was that childhood neurotic symptoms were more intensely associated with depression in women than in men. It has been emphasized in the literature that depressed persons have had psychiatric symptoms in childhood (Rodgers, 1990; Harrington *et al.* 1993). The result may be due to the fact that neurotic symptoms have their onset earlier in women than in men (Aro *et al.* 1987; Jorm, 1987). Childhood experiences in general may have a greater impact on the onset of depression at early adulthood than at an older age (Kessler & Magee, 1993). One possible explanation for the finding may be that as depression is more frequent in young women than in young men it is more intensely related to childhood neurotic symptoms. It is possible that childhood neurotic symptoms predict a higher degree of antisocial personality and alcoholism in males (Zaslow, 1988; Rutter, 1989; Robins & Price, 1991).

Both sexual and physical abuse have been reported to raise the risk for later depression (Holmes & Robins, 1988; Bifulco *et al.* 1991; Brown & Harris, 1993; Mullen *et al.* 1993). In the present study, corporal punishment (which was more frequent among males) was not associated with later depression, but corporal punishment in this study was not the same as physical abuse. As sexual abuse (which is inevitably more common among females) was not dealt with, it is hard to say whether or not its inclusion would have changed our results.

Although parental loss in childhood has long been considered as a risk factor for later depression (Tennant, 1988), in this study there was only a weak association between separation and adult depression. Most of the losses were due to parental death. Parental divorce, which

has been shown to predict depression in earlier studies (Parker, 1992), was a rather uncommon experience in our study.

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