Soc Psychiatry Psychiatr Epidemiol (2006) 41:889–896 DOI 10.1007/s00127-006-0113-8

ORIGINAL PAPER

Sylvia Helbig · Thomas Lampert · Michael Klose · Frank Jacobi

Is parenthood associated with mental health?

Findings from an epidemiological community survey

Accepted: 24 July 2006 / Published online: 1 September 2006

Abstract *Background:* Despite some reports on a potential link between parenthood and mental health, associations have not been systematically investigated yet. The present article provides prevalence rates of the most common mental disorders for parents and non-parents. Interactions between demographic and socio-economic variables, parental status and mental health are explored. *Methods:* Data from the 1998/99 German Health Survey (GHS) and its Mental Health Supplement (GHS-MHS) were analysed using logistic regression models. Analyses were restricted to participants in the age group 18 to 49 ($N = 2{,}801$). Mental disorders and syndromes were assessed with a standardized diagnostic interview (M-CIDI). *Results:* Parenthood was associated with lower rates of psychiatric morbidity in general, and depressive and substance use disorders, in particular. The association between parental status and mental health was more distinct in men than in women, whereas partnership status moderated this relationship: An absence of partnership was associated with increased rates of all common mental disorders. Among non-parents, such a difference could not be found. Full-time employment, compared to part-time employment or unemployment, was linked to lower rates of the common mental disorders among fathers but not among mothers and non-parents. Age, education and income had no effects on the association between parental status and mental health. *Conclusion:* Parenthood is positively associated with mental health, particularly for men. Most differences can be found for depressive and substance use disorders. Partnership seems especially important for parents since it does not affect prevalence rates of mental disorders among non-parents.

Key words mental disorders – children – parenthood – epidemiological survey

Data of this study are available as Public Use File from the senior author (manual and variable description in German language): Dr. Frank Jacobi, Institute of Clinical Psychology and Psychotherapy, Chemnitzer Str. 46, D-01187 Dresden, Germany; e-mail: jacobi@psychologie.tu-dresden.de. For further information about the Core Survey (GHS-CS) and its Public Use File, please contact the Robert Koch Institute, Dr. Heribert Stolzenberg, Nordufer 20, D-13353 Berlin, Germany; e-mail: stolzenbergh@rki.de.

Dipl.-Psych. S. Helbig (✉) · M. Klose · F. Jacobi
Institute of Clinical Psychology and Psychotherapy
Technische Universität Dresden
Chemnitzer Str. 46
01187 Dresden, Germany
Tel.: +49-351/463-36958
Fax: +49-351/463-36984
E-Mail: helbig@psychologie.tu-dresden.de

T. Lampert
Robert-Koch-Institute
Dept. of Epidemiology and Health Monitoring
Berlin, Germany

Introduction

Demographic factors such as age, gender and living circumstances as well as socio-economic variables as employment and income have been proven to influence well-being and mental health [e.g. 1–3]. In this regard, it is surprising that associations between parenthood and mental health have not yet been systematically explored, although selected literature points out such relations.

Evenson and Simon [4] tried to elucidate the relationship between parenthood and mental health by analysing depressive symptoms in different groups of parents (e.g. single parents, empty nest parents) and comparing these rates to non-parents. Interestingly, they found that no type of parenthood was associated with lower rates of depression compared to non-parents but that some kinds of parenthood were linked to raised rates of depressive symptoms, both in men and women.

Although the study of Evenson and Simon [4] was the first epidemiological study focusing exclusively on parental status and mental health, findings from epidemiological and clinical studies provide further information on relations between parenthood status and mental health. In contrast to Evenson and Simon, Bebbington and colleagues [5] suggested that parenthood might be associated with elevated rates of depression in women but not in men. They found that women without children were less affected by depressive disorders than mothers were. Men's mental health was not affected by parenthood. In further studies [6, 7] comparing mothers, who lived either in a partnership or alone, and women who were not involved in child-caring, single mothers were found to be most affected by mental health problems. In concordance with Bebbington et al. [5], women without children reported the lowest rates of depression.

Numerous studies in this field have addressed the mental health of single mothers for whom increased prevalence rates of any psychiatric morbidity [8] and of depression in particular [9–11] were found. Thus, single mothers are regarded as a high-risk group for mental disorders. However, it is still unclear, whether indeed parental status, lack of support or other moderating variables determine this effect. Partnership status might be an important source of variance as studies also found increased prevalence rates among singles without children compared to persons living in a partnership [3, 12].

The outlined findings give evidence that parenthood might actually be negatively linked to mental health, especially for women. For various reasons, it remains unclear, whether these results can be generalized. First, most studies referred to pre-selected groups as single mothers or women with a mental disorder, and, thus, provided only a limited perspective on the subject. Women without children were rarely considered. An exhaustive investigation of psychiatric symptoms among parents is only available for depressive symptoms [4], but not for common disorders in terms of DSM-IV-diagnoses. A second limitation is the neglect of men in research on the relationship between social roles and mental health. When single parenthood is inspected, the rather small number of single fathers complicates such comparisons. Third, less attention has been paid to potential moderating variables such as age or employment. Wang [11], for example, reported that the prevalence of depression among single and supported mothers differed only in the age group of 25 years to 50 years. Regarding employment, employed mothers reported better physical and mental well-being than housewives did [13]. On the contrary, Brown and Bifulco [14] found increased rates of depression among full-time employed mothers. Other authors [15, 16] assumed that employment needs to be regarded differentially. They found higher impairment among full-time employees with family but lower impairment among part-time employees with children. Among lone parents, economic hardship has to be considered as a moderating variable [7, 9] when associations between parenthood and mental health are inspected.

Almost no study differentiated between the number of children in the household when inspecting relations between parental status and mental health in the general population. Surveys indicate that subjective well-being may indeed vary with the number of children [17]. It might also be plausible that persons with more than two children experience more life stress and, hence, are more affected by mental problems. Stroebe and Stroebe [18] stated that the negative association between motherhood and subjective well-being would increase with the number of children. However, empirical evidence for that assumption is lacking.

The objective of our analyses was to untangle the associations between parenthood and mental health in the general population. We chose to examine the age group of 18 to 49 as the most relevant group in terms of parenthood. Variables potentially linked to parenthood were selected against the background of prior findings. We examined the following questions:

1. Is parental status associated with mental health?
2. Do demographic variables such as gender, age and current partnership status or socio-economic variables (education, household income, employment status) affect this association?

Methods

Design

The sample was taken from the German Health Interview and Examination Survey (GHS) and its Mental Health Supplement (GHS-MHS; $N = 4{,}181$; age: 18–65; conditional response rate: 87.6%). The GHS sample was drawn from population registries and can be regarded as representative according to age, gender and community type criteria for the adult German population 18–65-years old. The GHS consisted of a core survey and several supplemental surveys including the Mental Health Supplement (GHS-MHS). Data on mental disorders were gathered using a two-stage design. The first stage comprised a screening questionnaire for mental disorders that was administered at the end of the medical examination of the core survey. In the second stage, diagnoses for the most common mental disorders were assessed using a standardized clinical interview. This was done for all participants of the core survey who screened positive for a mental disorder in the first stage and for 50% of those who screened negative. Due to the resulting over-sampling of screen-positives, data were weighted for further analyses. Detailed information on design, sampling, response and core results are provided elsewhere [19–22].

For our analyses, we limited the sample to the age group of the 18- to-49-year-olds ($N = 2{,}801$) as the age group most involved in current child-caring. Parenthood was defined as living together with at least one child of one's own in the same household.

Sample characteristics

Among those between 18 and 49 of age, $n = 1{,}411$ participants were parents according to our definition; $n = 1{,}390$ participants were childless. The distribution of demographic and socio-economic

Table 1 Demographic and socio-economic sample characteristics (GHS-MHS; $N = 2{,}801$)[a]

		Total[b]		Parent[c] $N = 1{,}411$		Non-parent[c] $N = 1{,}399$	
		N	%	*N*	%	*N*	%
Sex	Women	1,387	49.4	746	53.8	641	46.2
	Men	1,423	50.6	665	46.7	758	53.3
Age	18–34	1,420	50.6	536	37.8	884	62.2
	35–49	1,389	49.4	875	63.0	515	37.0
Current partnership[d]	Yes	2,007	71.5	1,308	65.2	700	34.8
	No	801	28.5	103	12.9	698	87.1
Education[e]	*Hauptschule* (9 years)	822	29.3	449	54.6	373	45.4
	Realschule (10 years)	1,042	37.2	563	54.0	479	46.0
	Abitur (12–13 years)	609	21.7	247	40.6	362	59.4
	Other	254	9.1	119	46.9	135	53.1
	(still) no school education completed	77	2.8	31	39.7	47	60.3
Employment status							
Employed	Fulltime	1,567	55.8	752	48.0	815	52.0
	15–34 h/week	233	8.3	164	70.4	69	29.6
	<15 h/week	136	4.8	109	80.6	26	19.4
Not-employed	Student	228	8.1	21	9.3	207	90.7
	Retired	25	0.9	7	29.0	18	71.0
	Unemployed	157	5.6	79	50.6	78	49.4
	Homemaker	166	5.9	140	84.5	26	15.5
	Other or unknown	298	10.6	138	46.2	160	53.8
Weighted income[f]	Low	644	26.5	440	68.3	204	31.7
	Medium	1,115	45.9	630	56.5	485	43.5
	High	668	27.5	163	24.4	505	75.6

[a] Data weighted for non-response and design factors in all analyses; varying *N* in selected variables due to missing data
[b] Distribution in the sample
[c] Parenthood: currently living with at least one child of one's own in the household
[d] Partnership: currently living together with a partner (married or unmarried)
[e] German educational system
[f] Equivalence income weighted by number of persons in the household; low: below 75% of the median equivalence income (lower quartile), medium: 75–140% of the median equivalence income, high: above 140% of the median equivalence income (upper quartile)

variables in the sample is shown in the left columns of Table 1 (representative for the German population in that age range). Further, Table 1 depicts the parental status in the demographic and socio-economic subgroups. Among female participants, 53.8% were parents, whereas only 46.7% of men reported parenthood (OR = 1.3; 95% CI: 1.1–1.6). Most parents had either one or two children (each 43.5%, $n = 624$); 13% of parents reported having more than two children. The average number of children was 1.7; almost half of the children were younger than six years (45.6%; not shown in Table 1).

Parenthood was significantly more frequent in the older age group of 35 to 49 years (63.0% vs. 37.8% in the younger age group; OR = 2.8; 95% CI: 2.4–3.4). Among those living in a partnership, 65.2% were parents compared to 12.9% in the group without partnership. The $N = 103$ single parents represented 7.3% of all parents.

Parenthood was negatively associated with higher education (40.6% in respondents with 12 years of education or more vs. 54.6% in respondents with 9 years; OR = 0.6; 95% CI: 0.5–0.7) and higher weighted income (24.4% in the upper vs. 68.3% in the lower income quartile; OR = 0.1; 95% CI: 0.1–0.2). With regard to employment status, parenthood was most common in people working part-time and homemakers (70–85% vs. around 50% in respondents working fulltime or being unemployed and around 10% in students).

Because of sex and age differences between the groups, we also analysed whether the found demographic and socio-economic disparities were moderated by sex or age. We found significant interactions between parenthood, sex and current partnership: the majority of single parents were women (77%). Sex also interacted with parenthood and employment status: Mothers reported more often being part-time employed than fathers and non-parents of both sexes did. Rates of unemployment did not vary with sex. Similar interaction patterns were found for older age. Age additionally interacted with parenthood with respect to education indicating that older parents had more often only lower education than younger parents and non-parents had.

Assessment

The assessment of psychiatric morbidity was based on a computer-assisted clinical interview (M-CIDI), conducted by clinically trained interviewers (psychologists and MDs). The instrument [23–25] is a modified version of the World Health Organization CIDI (Version 1.2) [26] and assesses symptoms, syndromes, 4-week, 12-month and selected lifetime diagnoses of a wide range of mental disorders according to DSM-IV [27] and ICD-10 [28]. The present study focused on the following aggregated diagnoses (12-month prevalence rates): mood disorders (including major depressive disorder, dysthymic disorder, bipolar I disorders, bipolar II disorders, single hypomanic episode), anxiety disorders (including panic disorder; agoraphobia with or without panic disorder; social phobia; specific phobias: animal, natural environment, blood-injection-injury, situational type; obsessive compulsive disorder; generalized anxiety disorder and anxiety disorder NOS), somatoform syndromes and disorders (including somatization disorder; undifferentiated somatization disorder; somatic symptom index SSI 4.6 [29]; hypochondriasis; pain disorder), and substance use disorders (including substance abuse or dependence, without nicotine).

Information on demographic and socio-economic variables (e.g. parental and partnership status, education, employment status, income) were assessed with help of self-report questionnaires that were included in the core survey of the GHS.

Statistical analyses

To address different sampling probabilities and systematic non-response, we calculated prevalence estimates (*N*, %) with the data weighted for age, gender, region and design factors. Logistic regression (odds ratios and 95% confidence intervals) were used to estimate the associations between the different family types and correlated risks. To account for the weighting scheme as well as the stratified sampling design by screening status, statistical inference (confidence intervals and *p* values) was based on the Huber-White sandwich estimator of variance [30–32]. This was done with the Stata software package, release 8.0 [33].

Results

Parental status and mental health

We first computed 12-month prevalence rates of the most common mental disorders for both parents and non-parents. Overall, mental disorders were significantly more frequent in non-parents compared to parents (34.2% vs. 29.7%; OR = 1.2; 95% CI 1.0–1.5). Comparisons within the diagnostic categories showed that this was due to differences in the prevalence rates of depressive disorders (OR = 1.3; 95% CI 1.0–1.6) and of substance use disorders (OR = 1.6; 95% CI 1.1–2.3), indicating that both depressive and substance use disorders were less frequent among parents (Table 2).

We further analysed whether prevalence rates among parents varied depending on the number of children living in the household. Rates of mental disorders were lower among parents with two children, both compared to non-parents and parents with either one child or more than two children (25.4% vs. 34.2% for non-parents, 34.3% for one child, and 28.5% for more than two children). Similar results were found for all examined diagnoses; however, most comparisons failed statistical significance.

The same analyses were conducted for parents with children under six years in order to check whether the children's age affected these associations (not shown in Table 2). Prevalence rates among parents with younger children were slightly but not significantly lower than prevalence rates for parents in general (for any mental disorder: 27.1% vs. 29.7%). Again, having two children was associated with lower rates of mental disorders than having one child or having more than two children (22.9% vs. 30.2% for one child and more than two children, respectively).

Effects of demographic and socio-economic variables

In order to clarify the impact of demographic and socio-economic variables on the association between parental status and mental health, interaction terms for these variables, parenthood and mental disorders were conducted. Since results for somatoform disorders mostly failed statistical significance, they were excluded from Table 2 in order to enhance readability of the table. Specifications on these results are given in the text.

As expected, women were significantly more often affected by mental disorders among parents and non-parents; however, the interaction term revealed that this gender effect was significantly smaller in non-parents (interaction: OR = 0.61; CI 0.43–0.88). In the diagnostic subgroups, this could be found as a trend in mood disorders and somatoform disorders, although results failed statistical significance. In anxiety disorders and substance use disorders, gender differences in interaction with parenthood were less prominent or not existent.

Age in general did not affect the associations between parenthood and mental health. Substance use disorders were more frequent among younger persons in both groups.

The most important moderating variable was partnership status, indicating partnership to be positively associated only with parents' mental health (interaction: OR = 0.39; CI 0.24–0.65). Parents without partner reported mental disorders almost twice as often as parents with partner did (51.6% vs. 27.9%; OR = 2.75; CI 1.80–4.21). This finding could be replicated for all diagnostic groups except for somatoform syndromes, where partnership did not significantly affect the association between mental health and parental status. Among non-parents, rates of psychiatric morbidity were independent from partnership status (35.2% vs. 33.3% for any mental disorder). Only substance use disorders were twice as frequent among singles compared to non-parents with a partner (OR = 2.20; CI 1.37–3.54).

Full-time employment compared to part-time employment was advantageous in terms of lower prevalence of mental disorders for parents but not for non-parents (interaction: OR = 0.47; CI 0.26–0.48). Unemployment was linked to increased prevalence rates of mental disorders in both groups, but somewhat more in parents. A similar effect was found for persons who were not in the workforce (homemakers, students, etc.). The finding of lower prevalence of substance use disorders in part-time employment compared to fulltime (OR = 0.10; CI 0.01–0.77) can be explained by a gender effect (>90% of part-time working respondents were women) and was not specific for parents or non-parents. For substance use disorders, we also found an interaction between parental status, mental health and not being in the workforce, indicating that parents who were not economically active are significantly less often affected by substance use disorders than parents with full-time employment, whereas non-parents were assigned a diagnosis of a substance use disorder more often when economically active.

A medium or a high household income was associated with lower rates of mental disorders. The positive effect of higher income was found for both

Table 2 Parental status and the prevalence of mental disorders (12-month): Interaction with demographic and socio-economic variables

		Any mental disorder			Any depressive disorder			Any anxiety disorder			Any substance disorder		
		%	OR[a]	95% CI	%	OR[a]	95% CI	%	OR[a]	95% CI	%	OR[a]	95% CI
Parental status	Parent	29.7			10.8			14.6			4.4		
	Non-parent	34.2	1.23*	1.03–1.47	13.4	1.28*	1.01–1.63	13.8	0.93	0.75–1.16	7.0	1.63*	1.13–2.35
Number of children	One child	34.3			12.3			16.6			4.4		
	Two children	25.4	0.65*	0.50–0.85	9.1	0.72	0.49–1.04	12.5	0.72*	0.52–0.99	4.1	0.9	0.49–1.68
	More than two children	28.5	0.76	0.50–1.15	11.2	0.90	0.51–1.59	15.5	0.92	0.57–1.49	5.5	1.2	0.51–3.04
Sex													
Parents	Male	21.5			6.7			8.4			7.3		
	Female	36.9	2.14*	1.64–2.78	14.4	2.36*	1.59–3.49	20.2	2.75*	1.96–3.88	1.8	0.24*	0.13–0.44
Non-parents	Male	31.4			11.2			9.5			10.4		
	Female	37.5	1.31*	1.03–1.68	16.3	1.52*	1.08–2.13	18.9	2.21*	1.59–3.07	2.9	0.26*	0.15–0.44
	Parent × sex[b]		0.61*	0.43–0.88		0.64	0.38–1.08		0.80	0.50–1.29		1.07	0.47–2.42
Age													
Parents	18–34	31.0			10.7			14.4			6.2		
	35–49	28.9	0.90	0.70–1.17	10.8	1.02	0.71–1.47	14.8	1.03	0.75–1.40	3.3	0.51*	0.29–0.90
Non-parents	18–34	33.4			12.0			13.4			8.7		
	35–49	35.4	1.09	0.85–1.41	15.8	1.38	0.99–1.92	14.5	1.10	0.79–1.51	4.1	0.45*	0.27–0.74
	Parent × age		1.21	0.84–1.74		1.35	0.82–2.22		1.07	0.68–1.67		0.87	0.41–1.87
Partnership status													
Parents	Partner	27.9			9.8			13.6			3.8		
	No partner	51.6	2.75*	1.80–4.21	23.6	2.85*	1.73–4.70	27.5	2.41*	1.49–3.90	12.5	3.65*	1.88–7.10
Non-parents	Partner	33.3			12.3			14.0			4.5		
	No partner	35.2	1.09	0.85–1.39	14.6	1.22	0.88–1.70	13.7	0.97	0.70–1.34	9.5	2.20*	1.37–3.54
	Parent × partner		0.39*	0.24–0.65		0.43*	0.24–0.78		0.40*	0.23–0.72		0.60	0.27–1.36
Income													
Parents	Low	33.7			13.3			18.9			4.0		
	Medium	27.7	0.75*	0.57–1.0	10.1	0.74	0.50–1.09	12.7	0.62*	0.44–0.87	5.0	1.29	0.69–2.44
	High	27.2	0.73	0.47–1.14	6.9	0.49	0.24–1.00	13.0	0.64	0.36–1.13	2.6	0.65	0.21–1.95
Non-parents	Low	40.9			16.4			15.5			8.2		
	Medium	35.7	0.80	0.56–1.15	13.5	0.79	0.49–1.28	16.1	1.04	0.66–1.64	9.0	1.11	0.60–2.04
	High	31.3	0.66*	0.45–0.96	12.8	0.75	0.45–1.22	11.5	0.70	0.44–1.14	5.2	0.61	0.31–1.20
	Parent × medium vs. low income		1.07	0.67–1.69		1.08	0.58–1.28		1.67	0.95–2.95		0.86	0.36–2.07
	Parent × high vs. low income		0.90	0.50–1.59		1.53	0.64–3.66		1.10	0.25–2.30		0.95	0.26–3.44
Employment													
Parents	Full-time	22.8			6.7			9.7			5.4		
	Part-time	38.7	2.13*	1.55–2.93	13.2	2.13*	1.33–3.40	21.7	2.60*	1.76–3.78	2.6	0.46	0.20–1.08
	Unemployed	45.8	2.85*	1.72–4.74	23.4	4.23*	2.32–7.85	22.1	2.65*	1.44–4.85	6.9	1.92	0.86–4.27
	Not in workforce	31.1	1.53*	1.08–2.16	15.7	2.61*	1.63–4.17	17.0	1.91*	1.26–2.91	1.9	0.33*	0.14–0.82
Non-parents	Full-time	32.1			12.4			11.6			5.3		
	part-time	32.1	1.00	0.61–1.63	14.5	1.20	0.62–2.31	16.6	1.50	0.84–2.70	0.6	0.10*	0.01–0.77
	Unemployed	47.0	1.88*	1.14–3.09	20.2	1.78	0.99–3.20	23.9	2.37*	1.36–4.14	9.8	1.92	0.86–4.27
	Not in workforce	35.8	1.18	0.88–1.58	13.6	1.11	0.75–1.65	14.8	1.31	0.90–1.92	9.9	1.95*	1.15–3.31
	Parent × part time vs. fulltime		0.47*	0.26–0.84		0.57	0.25–1.27		0.58	0.29–1.17		0.23	0.03–1.99
	Parent × unemployed vs. fulltime		0.67	0.32–1.34		0.42*	0.18–0.97		0.90	0.39–2.04		1.47	0.44–4.96
	Parent × NIW vs. fulltime		0.77	0.49–1.21		0.43*	0.23–0.79		0.69	0.39–1.20		5.83*	2.06–16.46

[a] OR (95% CI) from logistic regression; reference: upper category
[b] Interaction with parental status
* $p < 0.05$

groups, parents and non-parents, and, thus, did not interact with parental status. We also found no interaction with education (results not reported in Table 2).

Due to the strong interactions with gender, we additionally computed analyses stratified for gender (Table 3). Results affirmed positive associations between parental status and mental health for men, but not for women. Partnership significantly interacted with parental status and mental health for both, mothers and fathers; however, except for substance use disorders, this interaction was stronger in men. Interestingly, substance use disorders were more prevalent in younger ages among both parents and non-parents, but again only in men. Effects of income were independent from gender. Fathers with other than full-time employment suffered significantly more often from depressive disorders than fulltime working fathers. This association could neither be found for mothers nor for non-parents.

Discussion

The study explored relationships between parental status and common mental disorders with help of epidemiological data representative for the German population in the age group of 18 years to 49 years. In

Table 3 Odds Ratios stratified for gender

		Any mental disorder		Any depressive disorder		Any anxiety disorder		Any substance disorder	
		Male	Female	Male	Female	Male	Female	Male	Female
Parental status: ref. parent		1.67*	1.02	1.76*	1.13	1.15	0.92	1.48	1.59
Age: ref. 18–34	Parents	1.01	0.95	0.93	1.19	1.60	1.01	0.37*	0.78
	Non-parents	1.23	0.93	1.17	1.50	1.29	0.90	0.48*	0.47
Partnership status: ref. partner	Parents	4.19*	1.96*	4.57*	2.04*	2.83	1.82*	5.00*	8.43*
	Non-parents	1.09	1.17	1.11	1.46	1.18	1.04	2.35*	1.07
Income: ref. low income									
Parents	Medium	0.80	0.75	0.77	0.76	0.55	0.69	1.88	0.39
	High	0.82	0.73	0.71	0.42	0.67	0.68	0.78	0.37
Non-parents	Medium	0.94	0.68	0.77	0.82	0.76	1.34	1.23	0.79
	High	0.67	0.66	0.88	0.65	0.48	1.00	0.56	0.65
Employment: ref. full-time									
Parents	Part-time	2.97	1.15	6.14	0.93	0.67	1.44	3.07	n.c.
	Unemployed	1.87	2.15*	6.30*	1.86	1.65	1.94	1.36	n.c.
	Not in workforce	2.26	0.82	7.60*	1.10	2.30	1.05	1.78	n.c.
Non-parents	Part-time	0.50	1.03	n.c.	1.38	2.20	1.07	n.c.	0.31
	Unemployed	1.63	2.21*	1.50	2.12	1.63	3.11*	2.42	0.70
	Not in workforce	0.99	1.33	0.81	1.36	0.94	1.43	2.30	2.07

* $p < 0.05$
n.c. not calculable

contrast to other studies [4, 5], we found an overall positive effect of parenthood on mental health that implied significantly lower rates of depressive disorders and substance use disorders in parents. This positive association between parenthood and mental health interacted with gender but not with age, indicating that gender differences in the prevalence of mental disorders are stronger in parents than in non-parents. We also could not confirm findings on a negative association between parenthood and current women's mental health (and depressive disorders, particularly). Although our findings suggest that only men's mental health is significantly linked to parental status, we found no evidence for disadvantages of parenthood among women. The fairly small variance of prevalence rates within the age groups is consistent with prior findings in the relevant age groups [1, 12].

Interestingly, current partnership was significantly associated with lower rates of mental disorders in parents but not in non-parents. This finding contributes to prior evidence for single parents being a high-risk group for mental disorders [8–11]. Single fathers represent only less than a quarter of all single parents but these cases are even more disadvantaged in terms of elevated prevalence rates than single mothers. The finding that partnership status did not interact with mental health among non-parents suggests that the negative effects of singlehood presumed in the prior literature [3, 12] might be existent only in parents.

Low income was associated with elevated rates of mental disorders in both parents and non-parents but did not interact with parental status. Against the background that parents were overall disadvantaged in terms of socio-economic status, it was surprising that parents in all income groups reported lower rates of the most common mental disorders since previous health surveys and meta-analyses indicated that such shortcomings are linked to poorer mental health [7, 10, 34, 35]. Unemployment also was associated with higher rates of mental disorders both in parents and non-parents, but this effect was stronger—although not statistically significant—in parents. Employment, therefore, seems to play an even more important role for parents. These findings support the assumption that financial hardship and unemployment are indeed associated with poor mental health but that interactions between gender, family status and the perception of the financial situation have to be considered [36–38].

Results regarding employment also indicate that part-time employment is negatively associated with mental health for parents but not for non-parents. Detailed analyses revealed that this was only true for men. We could not confirm findings that rates of depressive disorders are higher in mothers with full-time employment [14]. However, this finding needs further clarification, especially regarding possible interactions with partnership status.

We also found some evidence that the number of children living in the household may affect parents' mental health: Having two children was associated with lower rates of almost all common mental disorders. Reasons for that are unclear and, due to rather small sample sizes for parents with more than two children, they could not be explored. Sociological surveys have found that having two children is regarded as most desirable in the population [17]. In this respect, the association might be a result of selection processes—having two children might be a feature of well-adjusted couples. Data of prospective studies are needed to provide further clarification of

these associations. The age of the children was negligible for the prevalence of mental disorders.

Limitations

The results of our study are limited in several regards. Because the data were collected retrospectively and cross-sectionally, we cannot suggest causal interpretation of our findings. They are to be regarded as associations that might have reasons other than the assumed ones (e.g. it remains unclear whether having two children is a protective factor for mental health or whether only persons without mental problems have more than one child). Moreover, we cannot rule out that other sources of variance (e.g, relationship history) additionally influence the found associations. A few analyses need to be interpreted cautiously due to the small size of some sub-samples.

Subsamples were restricted to the age range of 18–49 years and defined as distinctively as possible; however, there are some uncertainties about group assignment. For persons assigned to the non-parent group, we do not know whether they have children who do not live in their household or whether they are (still) childless. This might be relevant as studies indicate that empty-nest parents report more well-being than parents whose children still live in the household [4]. However, since this would rather reduce the potential differences between parents and non-parents, we found that acceptable for an investigation of relations between current parental status and mental health.

Despite these limitations, our findings can be regarded as being representative for the German population, and they contribute to the exploration of mental health correlates. However, some questions remain. According to findings that involuntary childlessness is associated with depression as well as psychosomatic disorders [39], it should be differentiated between intended and unintended childlessness. Research on parenthood should also ask for unintended pregnancies as a potential source of mental health problems [40]. According to role hypotheses, diversification of roles positively affects mental health whenever desired. Unwanted roles, on the other hand, might implicate impairment. In this regard, unwanted separation from children (e.g. by divorce) and its effects on mental health have not been sufficiently explored yet. There are some studies demonstrating negative effects of separation on children's well-being [e.g. 41], including suicidal ideation [42], but effects of separation on the mental health of parents also need further clarification.

Conclusion

Parental status is associated with lower rates of any mental disorder in general, and depressive and substance use disorders, in particular. This association is clearly stronger in men. The absence of partnership is linked to an increase of psychiatric morbidity in single parents but not in single non-parents. Future studies should address unsolved issues such as actual direction of these associations (selection or causation hypothesis) and the influence of antecedents of parenthood (intended vs. unintended parenthood, relationship history).

Acknowledgements This study was in part supported by grant 01EH970/8 (German Federal Ministry of Research, Education and Science; BMBF). Reported data on mental disorders were assessed in the Mental Health Supplement of the German Health Survey (GHS-MHS), conducted by the Max Planck Institute of Psychiatry, Munich. Principal investigator was Prof. Dr. Hans-Ulrich Wittchen. Reported socio-demographic variables come from the study's Core Survey (GHS-CS), conducted by the Robert Koch Institute, Berlin. Principal investigators of the GHS-CS were Dr. Bärbel-Maria Kurth and Dr. Wolfgang Thefeld.

References

1. Al-Windi A, Elmfeldt D, Tibblin G, Svärdsudd K (1999) The influence of sociodemographic characteristics on well-being and symptoms in a Swedish community. Results from a postal questionnaire survey. Scand J Prim Health Care 17:201–209
2. Wilson SE (2001) Socioeconomic status and the prevalence of health problems among married couples in late midlife. Am J Public Health 91:131–135
3. Klose M, Jacobi F (2004) Can gender differences in the prevalence of mental disorders be explained by sociodemographic factors? Arch Womens Ment Health 7:133–149
4. Evenson RJ, Simon RW (2005) Clarifying the relationship between parenthood and depression. J Health Soc Behav 46:314–358
5. Bebbington P, Dunn G, Jenkings R, Lewis G, Brugha T, Farrell M, Meltzer H (1998) The influence of age and gender on the prevalence of depressive conditions: report from the National Survey of Psychiatric Morbidity. Psychol Med 28:9–19
6. Hoffmann B, Swart E (2002) Selbstwahrnehmung der Gesundheit und ärztliche Inanspruchnahme bei Alleinerziehenden – Ergebnisse des Bundesgesundheitssurveys. Gesundheitswesen 64:214–233
7. Targosz S, Bebbington P, Lewis G, Brugha T, Jenkins R, Farrell M, et al. (2003) Lone mothers, social exclusion and depression. Psychol Med 33:715–722
8. Lipman EL, MacMillan HL, Boyle MH (2001) Childhood abuse and psychiatric disorders among single and married mothers. Am J Psychiat 158:73–77
9. Brown GW, Moran PM (1997) Single mothers, poverty and depression. Psychol Med 27:21–33
10. Cairney J, Boyle M, Offord DR, Racine Y (2003) Stress, social support and depression in single and married mothers. Soc Psych Psych Epidemiol 38:442–449
11. Wang JL (2004) The difference between single and married mothers in the 12-month prevalence of major depressive syndrome, associated factors and mental health service utilization. Soc Psych Psych Epidemiol 39:26–32
12. Jenkins R, Lewis G, Bebbington P, Brugha T, Farrell M, Gill B, Meltzer H (2003) The national psychiatric morbidity surveys of Great Britain – initial findings from the Household Survey. Int Rev Psychiat 15:29–42
13. Abele AE (2001) Rollenvielfalt von Frauen-Einfluss auf psychische Gesundheit und Wohlbefinden. In: Franke A, Kämmerer A (eds) Klinische Psychologie der Frau. Hogrefe, Göttingen, pp 559–576

14. Brown GW, Bifulco A (1990) Motherhood, employment and the development of depression: a replication of a finding? Brit J Psychiat 156:169–179
15. Bebbington PE (1996) The origins of gender differences in depressive disorder: Bridging the gap. Int Rev Psychiatr 8:295–332
16. Loewenthal KM, Goldblatt V, Gorton T, Lubitsch G, Bicknell H, Fellowes D, Sowden A (1995) Gender and Depression in Anglo-Jewry. Psychol Med 25:1051–1063
17. Rost H, Rupp M, Schulz F, Vascovics LA (2003) Bamberger Ehepaar-Panel. Staatsinstitut für Familienforschung an der Universität Bamberg, Bamberg
18. Stroebe W, Stroebe M (1991) Partnerschaft, Familie und Wohlbefinden. In: Abele A, Becker P (eds) Wohlbefinden. Juventa, München, pp 155–174
19. Bellach BM, Knopf H, Thefeld W (1998) Der Bundes-Gesundheitssurvey 1997/98. Gesundheitswesen 60:59–68
20. Thefeld W, Stolzenberg H, Bellach BM (1999) German national health interview and examination survey: response, composition of participants, and analysis of non-respondents. Gesundheitswesen 61:57–61
21. Jacobi F, Wittchen HU, Hölting C, Sommer S, Lieb R, Höfler M, et al. (2002) Estimating the prevalence of mental and somatic disorders in the community: aims and methods of the German National Interview and Examination Survey. Int J Method Psych Res 11:1–18
22. Jacobi F, Wittchen H-U, Hölting C, Höfler M, Müller N, Pfister H, Lieb R (2004) Prevalence, comorbidity and correlates of mental disorders in the general population: Results from the German Health Interview and Examination Survey (GHS). Psychol Med 34:597–611
23. Wittchen H-U (1994) Reliability and validity studies of the WHO-Composite International Diagnostic Interview (CIDI): A critical review. Int J Psychiat Res 28:57–84
24. Wittchen HU, Pfister H (1997) DIA-X Interviews: Manual für Screening Verfahren und Interview; Interviewheft Längsschnittuntersuchung (DIA-X – Lifetime); Ergänzungsheft (DIA-X – Lifetime); Interviewheft Querschnittsuntersuchung (DIA-X – 12 Monate); Ergänzungsheft (DIA-X – 12 Monate); PC-Programm zur Durchführung des Interviews (Längs- und Querschnittuntersuchung); Auswertungsprogramm. Swets & Zeitlinger, Frankfurt
25. Wittchen HU, Lachner G, Wunderlich U, Pfister H (1998) Test–restest reliability of the computerized DSM-IV version of the Munich-Composite International Diagnostic Interview (M-CIDI). Soc Psych Psych Epidemiol 33:568–578
26. WHO (1997) Composite international diagnostic interview (CIDI, Version 2.1). World Health Organization, Geneve
27. American Psychiatric Association (1994) Diagnostic and statistical manual of mental disorders, 4th ed. American Psychiatric Press, Washington, DC
28. WHO (1991) ICD-10, Chapter V. Mental and behavioural disorders (including disorder of psychopathological development): (a) Diagnostic guidelines, (b) Diagnostic criteria for research. World Health Organization, Geneve
29. Escobar JI, Rubio Stipec M, Canino G, Karno M (1989) Somatic Symptom Index (SSI): A new and abridged somatization construct: Prevalence and epidemiological correlates in two large community samples. J Nerv Ment Dis 177:140–146
30. Binder DA (1983) On the Variances of Asymptotically Normal Estimators from Complex Surveys. Int Stat Rev 51:279–292
31. Royall RM (1986) Model robust confidence intervals using maximum likelihood estimators. Int Stat Rev 54:221–226
32. Woodruff RS (1971) A simple method of approximating the variance of a complicated estimate. Journal of the American Statistical Association 66(334):411–414
33. Stata Corporation (2001) Stata Statistical Software: Release 8.0 (Version College-Station). Stata Corportion, TX
34. Fryers T, Melzer D, Jenkins R (2003) Social inequalities and the common mental disorders. A systematic review of the evidence. Soc Psych Psych Epidemiol 38:229–237
35. Weich S, Churchill R, Lewis G, Mann A (1997) Do socio-economic risk factors predict the incidence and maintenance of psychiatric disorder in primary care? Psychol Med 27:73–80
36. Rodgers B (1991) Socio-economic status, employment and neurosis. Soc Psych Psych Epidemiol 26:104–114
37. Artazcoz L, Benach J, Borrell C, Cortès I (2004) Unemployment and mental health: Understanding the interactions among gender, family roles, and social class. Am J Public Health 94:82–88
38. Weich S, Lewis G (1998) Poverty, unemployment, and common mental disorders: population based cohort study. BMJ 317:115–119
39. Strauss B, Berger M, Bettge S, et al. (2000) Psychosomatik in der Reproduktionsmedizin – Teil 1. Z Med Psychol 9:101–110
40. Geller PA (2004) Pregnancy as a stressful life event. CNS Spectrums 9:188–197
41. Videon TM (2002) The effects of parent-adolescent relationships and parental separation on adolescent well-being. J Marriage Fam 64:489–503
42. Ang RP, Ooi YP (2004) Impact of gender and parents' marital status on adolescents' suicidal ideation 50:351–360