



Hypochondriasis and health anxiety in the German population

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Epidemiologic studies on hypochondriasis are very rare and have not been included in large North American community surveys until now. In order to gain information on the prevalence as well as the socio-demographic characteristics of hypochondriasis, the following community study was carried out. Analyses are based on an assessment of 1575 subjects selected by socio-demographic representation criteria for the German community. All subjects completed the Illness Attitude Scales (IAS) and responded to several additional questions on sociodemographics and diagnostic criteria pertaining to Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) hypochondriasis. The IAS is internationally one of the best-established self-rating questionnaires for the assessment of hypochondriasis and health anxiety. Results reveal a 0.4% point prevalence rate of DSM-IV hypochondriasis. In contrast to that, 6% of the German population suffers from severe health anxiety. There are small positive effects for female gender, higher age and lower school education on health anxiety. Subjects with high health anxiety report a much lower health-related quality of life and a higher risk for a type of psychotherapeutic or psychiatric treatment. These results support the development of less restrictive criteria for hypochondriasis and place emphasis on the clinical and socio-economic relevance of health anxiety.

Noyes (2001) stated some years ago: 'Relatively little is known about the epidemiology of hypochondriasis . . . No surveys of the general population have been completed' (p. 127). The present situation has not improved much.

One can only speculate the reason for the exclusion of hypochondriasis in the Epidemiologic Catchment Area Study and the National Comorbidity Survey. In the few community surveys that include hypochondriasis, a wide range of prevalence rates were found. Looper and Kirmayer (2001) randomly selected 533 subjects out of the general population in Montréal, Canada. Only one subject (0.2%) met the full criteria for ICD-10 and DSM-IV diagnosis of hypochondriasis. An Italian study by Faravelli *et al.* (1997) found different results. Six hundred and seventy-three subjects were interviewed by their general practitioners who had received psychiatric training. The 1-year prevalence rate for

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hypochondriasis according to DSM-III-R criteria was 4.5%. As each Italian citizen has to be registered by a general practitioner and the subjects were selected randomly from these lists, this study shall be considered as a community survey. Noyes, Happel, and Yagla (1999), in their study, interviewed first-degree relatives of general medical patients and found a prevalence rate of 7.7% for DSM-IV hypochondriasis. Rief, Hessel, and Braehler (2001) reported a prevalence rate of 6.9% for hypochondriasis, but used a screening questionnaire for somatoform disorders that provides only a broad indication of hypochondriasis.

The majority of epidemiologic studies on hypochondriasis were carried out in medical outpatient settings. The largest is the WHO cross-national study (Gureje, Üstün, & Simon, 1997). A stratified sample of 5447 patients, making ambulatory visits to primary care clinics in 14 countries were interviewed with the Composite International Diagnostic Interview (CIDI) (WHO, 1990). The 12-month prevalence rate for the entire sample was 0.8% for ICD-10 hypochondriasis. In their review, Creed and Barsky (2004) provide detailed information on epidemiologic studies for hypochondriasis. The range of hypochondriasis prevalence rates in primary care was from 0.26 to 8.5%, when DSM or ICD criteria were used. Along with these authors, it can be argued that further studies are needed, especially for population-based samples.

In the style of alternative concepts for a broader somatization disorder (Escobar *et al.*, 1998; Hiller, Rief, & Fichter, 1995; Rief & Hiller, 1999), attempts have been made to define and validate a subsyndromal form of hypochondriasis (Barsky, Cleary, Sarnie, & Klerman, 1993; Barsky, Wyshak, & Klerman, 1990a; Gureje *et al.*, 1997; Looper & Kirmayer, 2001). Gureje *et al.* defined an abridged version of hypochondriasis by leaving out the ICD-10 criterion 'refusal to accept medical reassurance.' The criteria for abridged hypochondriasis were met by 2.2% subjects. In terms of impairment, the latter was comparable to patients with ICD-10 hypochondriasis. In addition to concepts of abridged hypochondriasis, the term 'health anxiety' was conceptualized on a continuum ranging from mild to severe (e.g. Barsky, Wyshak, & Klerman, 1986), with hypochondriasis being at the severe end of the continuum (Asmundson, Taylor, Sevgur, & Cox, 2001).

Unlike somatization disorder, hypochondriasis seems to be less related to demographic factors. Gureje *et al.* (1997) and Escobar *et al.* (1998) found no gender differences for abridged hypochondriasis. A representative questionnaire study by Rief *et al.* (2001) found significantly higher scores for women, but the effect size was very small. A positive correlation with hypochondriasis and age is found in most studies (e.g. Gureje *et al.*, 1997; Hinz, Rief, & Braehler, 2003). Interestingly, Looper and Kirmayer (2001) demonstrated an age effect only for the subsample of subjects with illness worry as well as a medical illness, whereas subjects with illness worry but without a medical illness were of an age similar to the healthy controls.

The purpose of this study was (a) to gain information on the prevalence and the socio-demographic characteristics of hypochondriasis and hypochondriacal features and (b) to examine the impairment of subjects with health anxiety in terms of a lower health-related quality of life and the use of psychotherapeutic/psychiatric treatment.

Methods

Subjects and recruitment

The original sample consisted of 2198 subjects. Inclusion criteria were: residence in Germany, sufficient language ability and a minimum age of 18. The majority of subjects were assessed in the Rhine-Main-Area. Data collection was carried out by a group of eight trained psychology students from March to May in 2002. Subjects were asked to

participate in a study on the health beliefs of the German population by filling out a short questionnaire. No incentive was given. Recruitment took place in 10 different companies among: employees and workers (28.0%), music (19.4%) and sports clubs (13.5%), by front-door questioning in a district chiefly inhabited by the lower class (10.1%), different schools for all levels of education (8.5%), means of public transportation (6.8%), several clubs and two homes for the elderly (6.7% and 3.6%, respectively), and in a furniture shop (3.4%). Two hundred and fifteen questionnaires had to be excluded because of missing data, so a sample of 1983 remained. This sample had to be reduced in order to fulfil the criterion of representation according to gender, age, education and marital status. The data source was the 'Mikrozensus' published by the German Federal Statistical Office (<http://www.destatis.de>). Table 1 shows the socio-demographic characteristics of the study sample and the German population. The mean deviation of the study sample from the German population was 5.9% for the age groups (maximum of 13.1% deviation for the oldest group 76 years and above), 5.3% for the gender groups, 3.5% for the marital status groups (maximum of 8.7% deviation for the widowed subsample) and 23.9% for the type of schooling (more subjects with advanced secondary school experience in the study sample). Due to our criteria of representation, the final sample consisted of 1575 subjects.

Instruments

Subjects filled out a form with four pages which contained: socio-demographic information on page 1, the Illness Attitude Scales (IAS) on pages 2 and 3, and 10 additional questions on page 4, which are described later.

Table 1. Sample representation ($N = 1575$)

Age (years)	German population %	Sample % (N)
18–25	9.64	10.66 (168)
26–35	18.29	18.1 (285)
36–45	20.08	19.87 (313)
46–55	15.45	16.7 (263)
56–65	16.49	15.56 (245)
66–75	11.37	11.56 (182)
76 and above	8.70	7.56 (119)
Sex		
Male	48.82	46.16 (727)
Female	51.18	53.84 (848)
Marital status		
Unmarried	25.84	26.10 (411)
Married	57.80	58.10 (915)
Widowed	9.45	8.63 (136)
Divorced	6.90	7.17 (133)
Education (y.)		
Hauptschule (8–9)	51.89	39.62
Realschule (10)	27.89	33.53
Fachoberschule (12)	3.91	5.63
Gymnasium (13)	16.30	21.65

y., years of schooling. German schooling system can broadly be compared with British system as follows: Hauptschule – comprehensive school, Realschule – secondary school, Fachoberschule – specialized secondary school, Gymnasium – grammar school.

IAS are self-rating questionnaires that were developed by Kellner, Abbot, Pathak, Winslow, and Umland (1983–84) to assess psychopathology associated with hypochondriasis and abnormal illness behaviour. Questions were based on statements made by psychiatric patients who showed hypochondriac behaviour or felt sure they had a serious illness. The 27 items of the IAS are rated on a 5-point Likert-type scale from 'no' to 'most of the time.' Two more items are open questions. There are nine scales consisting of three items each: (1) worry about illness; (2) concerns about pain; (3) health habits; (4) hypochondriacal beliefs; (5) thanatophobia; (6) disease phobia; (7) bodily preoccupations; (8) treatment experience; and (9) effects of symptoms. Test-retest reliability over 1- to 4-week intervals ranged from .62 and .75 (scale 'hypochondriacal beliefs') to .92 and 1.00 (scale 'disease phobia') for two groups of healthy subjects (Kellner, Abbot *et al.*, 1987; Kellner, Slocumb *et al.*, 1987). Convergent validity with the Whiteley Index and the Somatosensory Amplification Scale was satisfactory (Speckens, Spinhoven, Sloekers, Bolk, & van Hemert, 1996). Kellner created the IAS subscales on the basis of theoretical considerations and never confirmed these by factor analyses or measures of internal consistency. Several studies by other authors found much less than nine factors (reviewed in Speckens, 2001). Concordantly, Speckens *et al.* (1996) and Hiller, Rief, and Fichter (2002) demonstrated a 2-factor solution with the subscales being 'health anxiety' and 'illness behaviour.' Sensitivity and specificity analysis brought out an optimal cut-off point of 45 (total score) with a sensitivity of 72% and specificity of 79% for a hypochondriacal group contrasted against a non-somatoform clinical control group (Hiller & Rief, 2004; Hiller *et al.*, 2002).

In addition to the IAS and socio-demography, five additional items had to be answered on a fourth page. Item 1 measured the health-related quality of life (EuroQoL; Kind, 1996; 'How good or bad is your state of health today?') with the use of a visual analogue scale. A cross had to be made on a line of 10 cm, the left end labelled 'worst status of health you can think of,' and the right end labelled 'best status of health you can think of.' Items 2–5 were devised according to the criteria of DSM-IV hypochondriasis. The exact wording is: (2) 'Did medical doctors find a precise cause for your complaints?,' (3) 'Do you worry or do you believe that you have a serious physical illness?,' (4) 'Did you feel severely impaired in daily life by the fear of having (or the conviction to have) a disease?,' (5) 'Did you have this fear or conviction for at least 6 months?.' For these items, the IAS response format was used. Finally, item 6 ('Have you ever been in psychotherapeutic or psychiatric care?') had to be answered with 'yes' or 'no.'

Statistical methods

Data analysis was performed by Statistical Package for the Social Sciences, release 11.5 (SPSS 11.5). Statistical analyses reported in this paper involve univariate tests, such as chi-squared for binary variables, Mann-Whitney *U* and Spearman's correlation for ordinal-scaled variables for item analyses. For interval-scaled scores, *t* tests for independent samples and Pearson's correlation were computed. As statistical significance does not indicate clinical relevance (especially in a large setting), effect sizes were computed as Cohen's (1988) *d*. According to Cohen, an effect size of at least $d = .20$ and $r = .10$, respectively, characterize effects of clinical significance.

Hypochondriacal features were measured by item response frequencies, scores on the two IAS subscales 'illness behaviour' and 'health anxiety' or the IAS total score. 'Hypochondriacs' were either defined by reaching the cut-off score of 45 in the IAS total score or by fulfilling diagnostic criteria described as follows: diagnostic criteria according

to DSM-IV were operationalized by IAS items and the additional questions. As a rule, criteria were fulfilled when subjects ticked one of the two most extreme ratings, e.g. 'often' or 'most of the time.' The detailed operationalization is described in the results.

Results

Prevalence of hypochondriacal core features

Table 2 describes the frequencies of all items of the IAS health anxiety subscale in the form of single item analysis. The question *Does the thought of a serious illness scare you?* (IAS item no. 3) was affirmed with 'often' or 'most of the time.' by 18.3% subjects. The question *Do you worry about your health?* (IAS item no. 1) was affirmed with 'often' or 'most of the time.' by 13.8% subjects. The lowest mean score can be found for

Table 2. Item frequencies of the IAS health anxiety subscale ($N = 1575$)

IAS item number and text	No 1	Rarely 2	Some times 3	Often 4	Most of the time 5	$M (SD)$
1. Do you worry about your health?	16.5	24.1	45.6	11.1	2.7	2.6 (1.0)
2. Are you worried that you might get a serious illness in the future?	24.9	26.1	39.1	8.8	1.1	2.4 (1.0)
3. Does the thought of a serious illness scare you?	26.1	21.4	34.2	10.8	7.5	2.5 (1.2)
4. If you have a pain, do you worry that it may be caused by a serious illness?	35.5	28.1	25.7	7.7	3.1	2.2 (1.1)
6. If a pain lasts a week or more, do you believe that you have a serious illness?	36.9	24.0	27.0	6.8	5.3	2.2 (1.2)
9. Do you examine your body to find whether there is something wrong?	26.2	27.1	31.2	9.1	6.5	2.4 (1.2)
10. Do you believe that you have a physical disease but the doctors have not diagnosed it correctly?	73.6	11.7	10.7	2.6	1.3	1.5 (0.9)
12. When you have been told by a doctor what he found, do you soon begin to believe that you may have developed a new illness?	79.1	13.3	6.3	0.8	0.5	1.3 (0.7)
13. Are you afraid of news that reminds you of death?	58.2	14.8	19.1	5.1	2.8	1.8 (1.1)
14. Does the thought of death scare you?	49.0	17.8	22.7	5.6	4.9	2.0 (1.2)
15. Are you afraid that you may die soon?	72.0	14.3	10.6	2.2	0.8	1.5 (0.8)
16. Are you afraid that you may have cancer?	51.1	20.1	23.3	4.3	1.1	1.8 (1.0)
17. Are you afraid that you may have heart disease?	57.5	18.3	18.3	4.2	1.7	1.7 (1.0)
18. Are you afraid that you may have another serious illness?	70.0	15.4	11.6	2.2	0.7	1.5 (0.8)
19. When you read or hear about an illness, do you get symptoms similar to those of the illness?	82.8	10.0	5.5	1.3	0.4	1.3 (0.7)
20. When you notice a sensation in your body, do you find it difficult to think of something else?	49.3	24.5	20.1	4.0	2.0	1.9 (1.0)
21. When you feel a sensation in your body, do you worry about it?	26.1	33.6	31.0	6.0	3.4	2.3 (1.0)
Do you worry or do you believe that you have a serious physical illness? (additional item)	77.8	11.4	7.9	1.6	1.3	1.4 (0.8)

the additional item *Do you worry or do you believe that you have a serious physical illness?* (2.9% affirming with 'often' or 'most of the time;' $M = 1.4$, $SD = 0.8$).

Prevalence of hypochondriasis

Two different ways of assessing the prevalence of hypochondriasis were used. In the first, IAS items and additional questions were used to check if DSM-IV diagnostic criteria were met, whereas in the second, the cut-off criteria based on the IAS total score to classify hypochondriasis were computed.

In Table 3, items and response levels used for the diagnoses of hypochondriasis are listed. As criteria C and F concern the differential diagnoses of other mental disorders, they cannot be assessed suitably by questionnaire and therefore were left out. Criterion A (fear or belief that one has a serious illness) was fulfilled if subjects ticked 'often' or 'most of the time' for at least one of the items, IAS 10 (belief to have an undiagnosed physical disease), IAS 16 (fear of having cancer), IAS 17 (fear of having a heart disease) or IAS 18 (fear of having another serious disease). Criterion A was fulfilled by 13.5% of the subjects ($N = 212$). Criterion B (persistence despite medical reassurance) was fulfilled if subjects ticked 'no' or 'rarely' for the additional item 'Did medical doctors find a precise cause for your complaints?'. This was the case for 16.2% subjects ($N = 255$). The combination with criterion A was applied to 2.9% sample. Criterion D (significant distress or impairment) was fulfilled if subjects affirmed the additional question 'Did you feel severely impaired in daily life by the fear of having or the conviction to have a disease?' with 'often' or 'most of the time.' In combination with criterion A, criterion D was reached for 2.0% subjects ($N = 31$, missing data for 8 subjects). Criterion E (duration of 6 months) was fulfilled if subjects affirmed the additional item 'Do you have this fear or conviction of having a serious illness for at least 6 months?' with 'yes.' Combined with criterion A, criterion E was fulfilled by 2.0% subjects ($N = 60$, missing data for 14 subjects). When all criteria necessary for the diagnosis of hypochondriasis are applied, the prevalence rate of hypochondriasis is 0.4% ($N = 6$, missing data for 14 subjects).

When the cut-off point of 45 (total score of the IAS) was used to classify hypochondriasis, as suggested by Hiller *et al.* (2002), the prevalence rate for hypochondriasis was 6.7% ($N = 106$). Fifty-one subjects (3.2%) reached the mean total score of 51.7 ($SD = 15.5$) that was reported by Hiller *et al.* for the sample of hypochondriacs diagnosed by DSM-IV.

Table 3. Additional items and response levels used for the diagnoses of hypochondriasis

	No	Rarely	Sometimes	Often	Most of the times
Did medical doctors find a precise cause for your complaints?*	11.7	5.0	7.6	15.3	37.0
Did you feel severely impaired in daily life by the fear of having or the conviction to have a disease?	84.4	6.7	5.4	2.3	1.2
Do you have this fear or conviction of having a serious illness for at least 6 months?	No: 86.8		Yes: 13.2		

*23.2% subjects ticked 'I have no complaints'. IAS items no. 10, 16, 17 and 18 were also used. Their frequencies are displayed in table 2.

Socio-demographic characteristics

Effects of gender, age, education and marital status were analysed. There were no significant gender effects found for the prevalence rates of hypochondriasis. There were three women and three men in the small subsample of subjects fulfilling criteria A + B + D + E pertaining to DSM-IV. Criterion A was fulfilled by 12.5% female and 14.6% male subjects. The cut-off criterion of IAS total score of 45 or higher was fulfilled by 6.8% of the female compared with 6.6% of the male subjects.

Non-parametric item analyses show a few gender differences. Table 4 shows item analyses with significant gender effects and effect sizes of at least $d = .20$. All gender group comparisons obtained small effect sizes. The highest effect sizes between the gender groups were achieved for items concerning health behaviour. Women avoid harmful habits ($d = .30$) and unhealthy food ($d = .36$) more often than men. Also, it is reported that women go to the doctor more often ($d = .28$).

Age effects are displayed in Table 5. Subjects who fulfil the cut-off criterion are significantly older ($d = .41$). There are significant but small correlations with age for the illness behaviour subscale ($r = .18$) and the IAS total score ($r = .13$). Most items correlate only minimally with age. The highest correlations with age were found for health habits (items 7 and 8) and medical consulting behaviour (item 23).

Table 4. Items with significant gender effects and effect sizes $d \geq .20$ ($N = 848$ women; $N = 727$ men)

	Sex	M (SD)	Z	Effect size d
3. Does the thought of a serious illness scare you?	f	1.65 (1.20)	-4.67***	.23
	m	1.38 (1.19)		
7. Do you avoid habits that may be harmful to you such as smoking?	f	2.70 (1.62)	-5.82***	.30
	m	2.21 (1.68)		
8. Do you avoid foods that may not be healthy?	f	2.40 (1.44)	-7.08***	.36
	m	1.88 (1.45)		
12. When you have been told by a doctor what he found, do you soon begin to believe that you may have developed a new illness?	f	0.24 (0.60)	-4.80***	.21
	m	0.38 (0.73)		
14. Does the thought of death scare you?	f	1.11 (1.25)	-3.44***	.21
	m	0.87 (1.07)		
23. How often do you see a doctor?	f	1.69 (0.89)	-5.28***	.28
	m	1.44 (0.88)		

*** $p < .001$. f, female; m, male.

A very modest, but negative influence of school education on hypochondriasis was found: the correlation between the level of education and the IAS total score is $r = -.10$ ($p < .001$).

The analysis of effects for marital status (comparing married subjects with non-married) found no significant differences for the IAS scales and frequencies of fulfilled criteria for hypochondriasis.

Illness behaviour, impairment, and illnesses diagnosed by physicians

In essence, the IAS subscale 'illness behaviour' includes health-care utilization and the subjective impairment by symptoms. The intercorrelation between the 'illness

Table 5. Age effects for IAS cut-off, subscales, total score and single items with a minimum $r = .10$ and $d = .20$, respectively ($N = 1575$)

	Age (years)		Effect sizes
	M (SD)		
Cut-off hypochondriasis	55.0 (19.1)	$t = 4.01$	$d = .41^{***}$
No cut-off hypochondriasis	47.4 (17.6)		
IAS 'illness behaviour' scale			$r = .18^{***}$
IAS total score			$r = .13^{***}$
4. If you have a pain, do you worry that it may be caused by a serious illness?			$r = .11^{***}$
7. Do you avoid habits that may be harmful to you such as smoking?			$r = .26^{***}$
8. Do you avoid foods that may not be healthy?			$r = .33^{***}$
17. Are you afraid that you may have heart disease?			$r = .18^{***}$
22. Has your doctor told you that you have an illness now? (dichotomous item)			$r = .18^{***}$
23. How often do you see a doctor?			$r = .28^{***}$
25. How often have you been treated during the past year (e.g. drugs, surgery)			$r = .18^{***}$
27. Do your bodily symptoms stop you from working?			$r = .14^{***}$

*** $p < .001$.

behaviour' subscale and the other IAS subscale 'health anxiety' is $r = .46$ ($p < .001$). In comparison, the correlation of 'having a diagnosed medical illness' (IAS item 22) with 'illness behaviour' is $r = .40$ ($p < .001$).

Two other measures of impairment were analysed. First, the use of psychotherapeutic or psychiatric treatment is related to hypochondriasis. Subsequently, assessing health-related quality of life in relation to hypochondriasis is examined. Table 6 shows these correlations and results of inferential statistics.

Table 6. Interrelation between hypochondriacal features, use of psychotherapeutic/psychiatric treatment and health-related quality of life

	'Have you ever been in psychotherapeutic/psychiatric care?'		Significance/effect sizes	'How good or bad is your state of health today?' +	
	Yes	No		Significance/effect sizes	
IAS cut-off hypochondriasis	$N = 33$ 31.1%	$N = 73$ 68.9%	$\chi^2 = 23.6^{***}$	$M = 50.5$ $SD = 23.9$	$t = -9.24^{***}$ $d = 1.01$
No IAS cut-off hypochondriasis	$N = 200$ 13.7%	$N = 1256$ 86.3%		$M = 73.0$ $SD = 20.4$	
IAS total score			$r = .20^{***}$		$r = -.43^{***}$
IAS health anxiety			$r = .15^{***}$		$r = -.36^{***}$
IAS illness behaviour			$r = .23^{***}$		$r = -.43^{***}$

*** $p < .001$. + visual analogue scale, range 0–100.

About one-third of the subjects who fulfilled the cut-off criterion for hypochondriasis (31%) have already experienced psychotherapeutic or psychiatric care. This equates to an odds ratio of 2.3, compared with the subjects who did not fulfil the cut-off criterion. The correlation of illness behaviour (basically measuring health-care utilization) and former psychotherapeutic/psychiatric care is $r = .23$. Also, the correlation of the IAS total score with former psychotherapeutic/psychiatric care is moderate ($r = .20$).

Interestingly, patients who fulfil the IAS cut-off criterion report a much lower health-related quality of life ($d = 1.01$). IAS total score shows a correlation of $r = -.43$ with health-related quality of life.

Finally, for the subsample of subjects fulfilling the IAS cut-off criterion ($N = 106$), physical illnesses were analysed. Considering item 22 ('Has your doctor told you that you have an illness now. If yes, what illness?'), 22 subjects answered 'yes'. Among these, eight subjects reported to have a cardiovascular disease, five cancer and nine other illnesses. Among the eight subjects who reported to have a cardiovascular disease, six affirmed the IAS item no. 17 'Are you afraid that you may have a heart disease?' with 'often' or 'most of the time'. Among the five subjects reported to have been diagnosed with cancer (item 22), four affirmed the IAS item no. 16 'Are you afraid that you may have cancer?' with 'often' or 'most of the time'. Among the subjects who reported to have other illnesses, only four reported to be afraid of the same illness. To summarize, 14 subjects (1.3% health anxious subsample, 0.9% total sample) actually had the illness they feared.¹

Discussion

This study is one of the very few epidemiologic surveys regarding hypochondriasis in the general population. The initial sample consisted of 2,198 subjects. Representation for the German population was strictly defined according to age, gender, education and marital status.

However, some shortcomings of this study need to be mentioned. First, to be precise, the sample was not randomly selected and therefore may not have been representative. Secondly, it is not known how many subjects of those invited to participate decided not to. Their responses might have differed. Furthermore, only one validated instrument was used to measure hypochondriasis and health anxiety. No clinical interviews could be carried out. The prevalence rates of DSM-IV were based on self-report items of untested reliability. Therefore, the prevalence rates stated below must be taken into consideration.

Regarding health anxiety as a less strictly defined form of hypochondriasis, it can be concluded from the data that 14% German population affirmed the DSM-IV probe question for hypochondriasis (belief or fear of having an undiagnosed serious illness; criterion A) and approximately 6% reached the IAS cut-off score indicating high health anxiety. For hypochondriasis as a distinct and strict category, frequencies decreased considerably: only 0.4% (6 subjects) fulfilled the criteria for DSM-IV hypochondriasis. Gureje *et al.* (1997) used the ICD-10 system and could identify one single criterion that reduced prevalence rates disproportionately. In the present study, the addition of one criterion B, D or E (regardless of which) brought a comparable reduction in the

¹ A detailed list of the illnesses feared and diagnosed can be sent by the authors on request.

prevalence rate (A + B: 3%, A + D: 2%, A + E: 4%). Although these results have to be interpreted carefully, as no clinical interviews were used, the relatively low point prevalence rate of 0.4% for hypochondriasis according to DSM-IV criteria corresponds with the findings of Gureje *et al.* (1997) (0.8%) and Looper and Kirmayer (2001) (0.2%) who reported hypochondriasis to be a rare disorder. The majority of studies that found higher prevalence rates (e.g. Barsky, Wyslak, Klerman, & Latham, 1990b; Kellner, 1985; Noyes *et al.*, 1999; Noyes *et al.*, 1993) were either carried out in the medical setting or used self-administered questionnaires.

In contrast to that, it can be estimated that approximately 6% of the German population suffers from health anxiety in a way that they do feel clearly impaired: the 106 subjects who reached the IAS total score cut-off reported a much lower health-related quality of life ($d = 1.01$). The probability of a previous form of psychotherapeutic or psychiatric care was 2.3, higher for those subjects with high health anxiety. It should be noted that health anxiety (assessed by the IAS subscale) correlated even higher with illness behaviour (mostly measuring visits to medical doctors; $r = .46$) than the fact of having a medical illness ($r = .40$). The implications of such high rates of health anxiety should be considered. It can be estimated that in Germany, more than 5 million people suffer from the fear of having a serious illness. They probably account for a considerable part of the total visits to medical doctors, which are more frequent in Germany than in most other European countries (Schneider, Hofmann, & Köse, 2004). This indicates a great socio-economic relevance of hypochondriasis, especially its subsyndromal forms.

According to the findings of Looper and Kirmayer (2001), 52% subjects with illness worries actually had the illness they worried about. In the present study, it was the case for only 13.2% subjects with health anxiety ($N = 14$, 0.9% total sample). As health anxiety is defined as the fear of having an illness despite the medical reassurance not to have this illness, these 14 subjects were assigned to the health anxious subgroup as false positives by the IAS. Further, researchers using these scales should be aware of this problem. Fortunately, the IAS provides the possibility to select these false positives by evaluation of the items 18 and 22.

Excluding the subjects with illness worries about an illness that was diagnosed, there still remains a rate of 5.8% subjects with high health anxiety. For Looper & Kirmayer as well as for the present study, only the subjects were assessed (and not their physicians), therefore, the results should be interpreted with care.

Several researchers argue that the present ICD-10 and DSM-IV definitions of hypochondriasis are highly restrictive, especially for the use in primary-care settings (Gureje *et al.*, 1997; Looper & Kirmayer, 2001). Even though the present data do not suggest the change of a specific criterion, it is suggested that the criterion related to 'fear despite medical reassurance' is relaxed (see also Gureje *et al.*, 1997), and the '6 months minimum' criterion is reduced (see also Creed & Barsky, 2004) in order to decrease the diagnostic threshold of DSM-IV and ICD-10. Further research is needed to confirm high impairment and costly illness behaviour for abridged criteria of hypochondriasis. One additional reason for the discrepancy between low prevalence rates for hypochondriasis and much higher rates for high health anxiety may be the enduring stigmatization of hypochondriasis. As hypochondriasis is sometimes still mistaken for deliberate deception, e.g. in mass media, people probably have difficulties in acknowledging that hypochondriacal criteria are appropriate for them. When they have to rate for features of health anxiety on a Likert scale, it possibly feels less pathological.

Similar to several other studies, no gender effects for hypochondriasis were found. However, item analyses show some slight significant effects: women report more health behaviour in terms of less smoking and less consumption of unhealthy food. These results are supported by other findings: although gender differences decrease, the prevalence of smoking is still higher in men than in women (National Centre for Health Statistics, 1996; Centres for Disease Control, 1989). It is often reported that women are much more interested in healthy diet. However, as some researchers have found before, health habits do not correlate with health anxiety (e.g. Kellner, Abbot *et al.*, 1987; Kellner, Slocumb *et al.*, 1987; Rief, Hiller, & Margraf, 1998).

Those with severe health anxiety (classified by cut-off score) were on an average 7 years older than those without. Highest correlations with age were found for health habits and medical consulting behaviour. In their survey of the Italian psychiatric population, Altamura *et al.* (1998) found hypochondriasis to be more common among patients of at least 45 years. Following the procedure of Looper and Kirmayer (2001) who demonstrated an age effect only for the subsample of subjects with a medical illness, we partialled out the variable of having a medical illness and found much lower correlations with age. It can be hypothesized that age effects of hypochondriasis demonstrated in other studies can be explained much better by medical diseases.

No effect of marital status was found. This is quite comprehensible considering that marital status *per se* does not reveal the quality of the partnership and the social support. Further studies should concentrate on the quality of the partnership as a potential moderating variable.

The most important finding of this study is the high impairment of subsyndromal hypochondriasis defined as high health anxiety. It can be estimated that at least 6% German population suffer from health anxiety, which considerably reduces their health-related quality of life, increases medical consulting behaviour and the seek of psychotherapeutic or psychiatric care.

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