Psychiatric disorders and associated factors in cancer: results of an interview study with patients in inpatient, rehabilitation and outpatient treatment

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Abstract

An association between mental disorders, especially affective and anxiety disorders, and cancer has been reported in many studies. The present study investigated current (4-weeks-, 12-months-, and lifetime-prevalence rates of comorbid mental disorders in cancer patients. Through a cross-sectional design, 517 patients (75% female patients) from two acute inpatient care clinics, two rehabilitation clinics and nine specialised practices for oncology were examined with standardised scales for psychological burden and quality of life. Somatic parameters were assessed through standardised medical records. In the second-stage-examination, a sample of 200 patients was interviewed with standardised clinical interview (CIDI) in order to obtain DSM-IV diagnoses of mental disorders. Differences in the type of mental disorders were examined for gender, treatment setting, severity of cancer and physical impairment. Prevalence rates of mental disorders were 23.5% for the 4-weeks, 40% for the 12-months, and 56.5% for the lifetime periods. The current and 12-months rates of affective and anxiety disorders were approximately 25–33% higher than prevalence rates found in recent epidemiological studies of the general population. These higher rates were, however, mainly due to the preponderance of female patients with a higher risk for mental disorders compared with males. The most prevalent current disorders were affective (9.5%), and anxiety disorders (13%). Female gender was associated with an approximately 2-fold risk of mental disorders during the patient's lifespan. Current diagnosis of affective disorders in women was highly related to the cancer. Physical impairment was also associated with the frequency of current psychiatric disorders, especially affective and anxiety disorders. The frequency of mental disorders in cancer patients does not differ from results of recent international epidemiological studies of the normal population. The slightly higher rates of anxiety disorders are mainly due to phobias (simple, social and agoraphobia) without urgent need for treatment. A relatively large portion of patients, however, fulfil the criteria of minor depressive disorder which deserves clinical attention. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

Primary reactions of patients to the diagnosis of a tumour are often followed by a period of emotional instability marked with increased anxiety, depressive mood and decrease of daily activities. These reactions are an adaptation to the disease. In the following period, most patients are able to cope with the illness, its effects and the change of life, either alone or with the help of attending physicians, family and friends. However, a proportion of cancer patients develop psychiatric disorders following the diagnosis which requires special treatment. A number of patients also have psychiatric disorders, that already exist premorbidly or recur because of the increased strain as a result of the disease and its treatment (e.g. recurrent depressive disorders).

In the past 20 years, numerous studies on the prevalence of psychiatric disease in tumour patients have been conducted [1–7]. These studies focused on the examination of depressive disorders which are frequently associated with cancer. In their review, DeFlorio and Massie [8] described 49 studies and van't Spijker and colleagues in their meta-analysis [9] described 58 studies between 1980 and 1994, in which this association was examined. Noyes and colleagues [10] reported on 23 studies concerning the prevalence of anxiety disorders in tumour patients within the past 25 years which partly overlapped with the studies from the aforementioned reviews [8,9]. In the meantime, the results of these studies and their clinical implications have also been considered in numerous other reviews and chapters [11–17]. The prevalence rate for general psychiatric burden or psychiatric disorders among cancer patients ranges between 5 and 50% ([9], see also [12,18–20]), for depressive disorders between 0 and 46% and for anxiety disorders between 0.9 and 49%. DeFlorio and Massie [8] report a similar range of 1–53% for the occurrence of depressions, while Noyes and colleagues [10] report 15–28% for anxiety disorders.

The large variations in the prevalence rates are due to methodical and clinical differences. Comorbidity studies are based on different: (a) instrumentation (questionnaire versus clinical interview or standardised clinical interview procedures), (b) classification systems (now ICD-10 and DSM-IV), (c) time periods of prevalence and (d) clinical differences in tumour patients (e.g. tumour site, stage, setting). In addition, there are difficulties in making a diagnosis because of symptom overlap, particularly depression (e.g. weight reduction, sleep disturbance, loss of energy) and somatic symptoms caused by the cancer and treatment [21–24].

Up to now, it has not been possible to differentiate the prevalence of mental disorders in different types of tumour diseases. The exception is pancreatic carcinoma which is associated with a high prevalence of depressive disorders. The stage or severity of the tumour disease is most likely correlated to the frequency of the depressive disorders [2,11,20]. Furthermore, several risk factors are verified empirically with regard to their influence on the development of depressive disorders (e.g. uncontrolled pain, absence of social support [13,21]).

The question of whether there are gender differences regarding the type and frequency of mental disorders in cancer patients is also not definitely answered: In contrast to epidemiological studies of the general population, the majority of studies show no significant gender differences. However, there are also studies that show significant gender differences or non-significant trends, e.g. regarding the frequency of anxiety disorders [9]. Furthermore, it is not clear whether inpatients of a primary care clinic or a rehabilitation centre are more or less frequently psychologically disturbed than outpatients. The present study examines the following questions:

- To what extent are cancer patients burdened regarding their current well-being ?
- What is the 4-weeks, 12-months and lifetime prevalence of various mental disorders in cancer patients?
- To what extent are mental disorders comorbid among cancer patients?
- Are there differences in the prevalence with regard to gender, the severity of the tumour, physical function or treatment setting (outpatient versus inpatient treatment)?

2. Patients and methods

2.1. Study sample

The inpatient and rehabilitation samples were recruited from four oncology units, one from the Freiburg Medical Centre (department of Gynaecology and Obstetrics), two from the Clinic for Tumourbiology in Freiburg (primary care and rehabilitation department), and one from another rehabilitation clinic. Because of this access, a higher rate of female patients was expected in the study sample. The outpatient sample comes from one outpatient clinic and eight specialised practices for oncology and haematology in Southern Germany. Within a determined time period, all newly registered patients or those seeking treatment were consecutively examined to minimise selection bias. To record mental disorders, every second patient was asked to participate in a clinical interview. The interviewing of inpatients was conducted within the first 3 days after admission into the clinic. The outpatients were interviewed on the day of their visit. Interviews with outpatients were carried out in only four of the nine practices which were close to the study centre. The other five practices were too far away to carry out face-to-face interviews with the patients.

Participants were at least 17 years old (maximum age of 84 years) and were engaged in active treatment interventions. Patients were informed that the aims of the study were to determine the prevalence of psychiatric morbidity in cancer patients and to measure the consequences of cancer and comorbid mental illnesses on daily living and quality of life.

2.2. Measures

The two-step study consisted of a questionnaire and medical records combined with the use of a standardised interview procedure to record mental disorders.

- General Health Questionnaire (GHQ-12) [25]

The GHQ-12 is a screening test to identify mental disorders primarily in the general population and in non-psychiatric clinical settings, especially in primary care (score range = 0–12).

- Hospital Anxiety and Depression Scale (HADS) [26]

The HADS was developed for specific use in patients with somatic illnesses (score range: 0–21). The HADS is the best examined screening instrument for depressive and anxiety disorders in cancer patients (e.g. [27–30]) and is also recommended as such in the guidelines for screening [17].

- SF-36 Health Survey [31]

The SF-36 records eight dimensions of life quality which can be categorised conceptionally in 'physical health' and 'mental health'. It is especially suited as an instrument to screen the general state of health and its changes.

- Composite International Diagnostic Interview (M-CIDI) [32]

The M-CIDI is an expanded, updated and computerised version of the World Health Organization CIDI [33]. It is an assessment system which enables the diagnosis of mental disorders reliably and efficiently using the DSM-IV criteria. The main advantage of this procedure is the high objectivity and interrater-reliability (kappa: 82–0.98 [33]).

- Medical Chart

All patients were assessed regarding the somatic diagnoses, the TNM stage, the severity of the disease (tumour stage, existing metastases, relapse) and the type of initiated treatment (chemotherapy, operations, radiation therapy, etc.) by the attending physicians.

2.3. Interviewer

All interviewers were psychologists, psychology students in the last term of training or doctors either in clinical training or with clinical experience. The interviewers were trained to use the CIDI interview in a standardised 2-day interview training. In addition, two members of our work group had previously completed a train-the-trainer seminar with the author of the German CIDI-version (H.-U. Wittchen).

2.4. Data analysis

Data analysis included descriptive statistics, standard Chi-square tests for two-way contingency tables of categorical variables and analyses of variance (ANOVA, t-test) for continuous data. The associations between DSM-IV diagnosis of mental disorders and potential risk factors (gender, disease severity, physical impairment, treatment setting) were analysed via calculations of the odds ratios [Statistical Package for the Social Services (SPSS) Version 9.0].

3. Results

3.1. Patients

A total of 517 cancer patients from 13 institutions (four clinics, nine practices) were examined (Table 1). Nearly all patients gave their consent to fill in the questionnaire (return rate: 96%). Of these, 39% of the patients included in the study were interviewed with the CIDI. The goal to interview every second patient was reached very well in the inpatient (51%), the rehabilitation setting (44%), and partially in the outpatient sample (32%). This was due to the fact that interviews were carried out in only four of the nine practices. Complete medical charts from the attending physicians were available for 491 patients (95%).

Because the recruitment of inpatients was carried out mainly in the Department of Gynaecology and Obstetrics, 75% of the patients were female. Therefore, the percentage of 88% women was higher in the inpatient sample compared with the other two settings ($\chi^2 = 21.94$ degrees of freedom (df) = 2, $P < 0.001$). At the time of the study, the average patient's age was 55 years (range: 17–84 years). There was no significant difference between the samples regarding marital status. Two thirds of the patients were married, 10% were divorced, 10% widowed and 12% single (Table 2).

The most frequent diagnoses were tumours of the breast, of the gastrointestinal tract and gynaecological tumours (Table 3). Approximately half the patients (45%) had a relapse in the clinical course, and at the time of the study 51% of the tumours had metastasised. Furthermore, the patients' physical function was clearly impaired and they were burdened by bodily pain. Almost half of the patients were in complete remission, 22% had progressive disease and 32% were in remission or had stable disease at the time of admission. More than 80% of the patients were involved in active anti-cancer therapy, with chemotherapy or surgery being the most frequent procedures.

3.2. Psychological burden

Screening with the questionnaire for the GHQ-12 and HADS showed that a considerable percentage of patients reported a medium to high level of psychological burden: In the GHQ, 23% reported a medium (score: 2–4) and 38% a heavy burden during the past weeks (score: 5–12). On the scale *depression* in the HADS

(Fig. 1), 17% of the patients indicated a burden which lies above the recommended cut-off value ⩾11 (5% with high scores from 15 to 21). On the scale *anxiety*, there were comparable results: 20% of the patients had scores above the cut-off ⩾11 (4% with high scores from 15 to 21).

There were no significant differences in the GHQ scores between patients which were examined with the questionnaire *only* [mean = 4.0, standard deviation (S.D.) = 4.0] compared with those examined with questionnaire *and* interview (mean = 4.1, S.D. = 3.9). Similarly, the scores of the sub-scales *depression* (mean — questionnaire sample = 6.1, S.D. = 4.5; mean — interview sample = 6.2, S.D. = 4.2) and *anxiety* (mean — questionnaire sample = 6.6, S.D. = 4.2; mean — interview sample = 7.2, S.D. = 4.1) of the HADS also showed no significant differences. These findings indicate that the patients chosen for the interview did not have a greater psychological burden compared with the patients who were examined with the questionnaire only.

3.3. Prevalence of psychiatric disorders

Table 4 presents the 4-weeks-, 12-months-, and lifetime-prevalence rates for psychiatric disorders

(DSM-IV) in the sample. As expected, the most frequent diagnoses found were anxiety and affective disorders which together made up 58% of all psychiatric diagnoses. Furthermore, the prevalence rates of substance-related disorders, especially nicotine dependence were significant.

Regarding psychiatric comorbidity (two or more simultaneous mental disorders), the rates were 5.5% for the 4-weeks prevalence, 12.0% for the 12-months prevalence, and 29.0% for the lifetime prevalence, the most frequent being multiple anxiety disorders or simultaneous affective and anxiety disorders.

The DSM-IV diagnosis *mood disorder due to a medical condition* (in this case: cancer) is especially relevant regarding lifetime-prevalence (Table 5). This diagnosis was made by the CIDI procedure, if the patient reported an association between cancer and psychological problems. A careful *post-hoc* analysis of the affective symptoms of these patients (counting of all the symptoms) within the documented interviews showed that, except for one case, there was no direct pathophysiological correlation to cancer or other somatic illnesses that would justify this DSM-IV diagnosis. Furthermore, all patients in this category fulfilled the criteria of a

Table 1
Study samples, measurements

	Inpatient sample n = 169	Rehabilitation sample n = 87	Outpatient sample n = 261	Total sample n = 517
Clinics/practices	2	2	9	13
Questionnaires (return rate %)	161 (95)	87 (100)	247 (95)	495 (96)
CIDI interviews (rate in %)	82 (51)	38 (44)	80 (32)	200 (39)
Medical charts (rate in %)	158 (94)	87 (100)	246 (94)	491 (95)

CIDI, Composite International Diagnostic Interview.

Table 2
Demographic characteristics of patients

	Inpatient sample n = 161	Rehabilitation sample n = 87	Outpatient sample n = 247	Total sample n = 495
Sex (%) F:M	88:12	71:29	68:32	75:25
Age, mean (range) (years)	56 (26–84)	50 (19–78)	57 (17–81)	55 (17–84)
Marital status (%)				
Married	62	65	70	66
Divorced	7	10	11	10
Separated	2	2	1	2
Widowed	13	8	9	10
Single	16	15	9	12
Living with partner	69	82	80	77
Occupational status (%)				
Fully employed	13	34	12	16
Part-time employed	17	19	14	16
Housewife/husband	19	21	27	23
Unemployed/unoccupied	2	1	1	2
Early retired	17	9	16	15
Retired	32	16	30	28

F, female; M, male.

Table 3
Diagnoses, Tumour Status, Severity and Treatment

	Inpatient sample $n = 158$	Rehabilitation sample $n = 87$	Outpatient sample $n = 246$	Total sample $n = 491$
Organ system (in %)				
Breast	37	35	40	38
Gastrointestinal	10	9	25	18
Gynaecological	33	12	7	16
Haematological/lymphatic	4	17	9	9
Urological	4	9	2	4
Others	12	18	17	15
Time since first diagnosis: mean (years)	1.7	2.8	3.2	2.7
Severity of disease (in %)				
Metastases	42	15	69	51
Relapse	37	16	62	45
Tumour status (in %)				
Complete remission	48	74	33	46
Progression	25	11	26	22
Remission	15	9	19	16
Stable disease	12	6	22	16
Physical impairment (range: 0–100) mean				
Bodily pain (range: 0–100) mean	52	66	62	60[a]
Current treatment (multiple responses, in %)	55	60	69	62[b]
Chemotherapy	48	2	83	57
Radiotherapy	9	0	8	7
Phase after surgery	45	2	16	23
Hormone therapy	4	20	12	10
No treatment	3	75	5	18

[a] Comparison to sample of cancer patients (mean = 75) in the SF-36 manual [31].
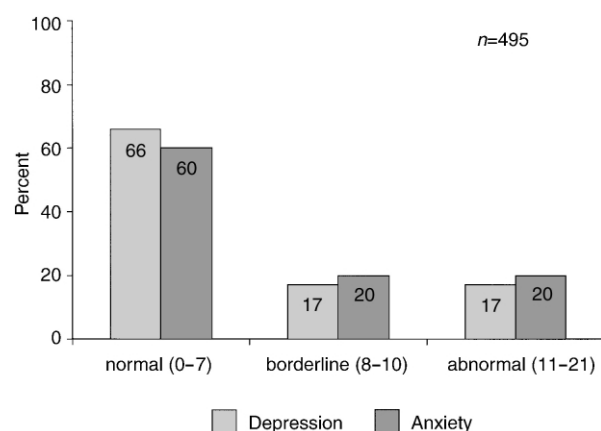[b] Comparison to sample of cancer patients (mean = 60) in the SF-36 manual [31].

Fig. 1. Distribution of depression and anxiety scores (HADS).

major depression (minimum: five of nine criteria). Therefore, including these three categories (MD single episode, recurrent and affective disorder due to a medical condition) major depressive disorders were diagnosed in 5.5% of the patients currently, 12.5% in the yearly interval and 20.5% in the lifetime period.

The most frequent syndromes of the anxiety disorders were specific phobias and panic disorders with or without agoraphobia. An extended re-analysis showed, however, that only approximately 2/3 of these anxiety disorders also needed treatment. Regarding the CIDI, those disorders were in need of treatment where the patient felt his/her life and daily activities were impaired. Accordingly, the prevalence of anxiety disorders in need of treatment was reduced within the three time periods from 13.0 to 7.5% (4 weeks), from 20.5 to 11.5% (12 months), and from 30.5 to 19.5% (lifetime). This reduction was mainly due to lower rates of specific or social phobias, and panic disorders with and without agoraphobia in need of treatment.

3.4. Risk factors

The analysis of prevalence rates in relation to gender, severity of tumour disease (metastasis yes/no), physical impairment (high versus low), and treatment condition (inpatient versus outpatient) shows that there were *gender differences* in the prevalence rates in all three time periods: Women were more likely than men to report mental disorders (on the whole) in the lifetime interval [odds ratio (OR) = 2.2; $\chi^2 = 5.82$, df = 1, $P = 0.01$]. The rates for mental disorders among women were also higher in the 4-weeks (OR = 1.5) and 12-months period (OR = 1.5), although not significantly. The prevalence rates of current affective illnesses were particularly elevated in women (OR = 7.5; $\chi^2 = 5.03$, df = 1, $P = 0.02$),

but not significantly higher in the other two prevalence periods (OR = 1.6 res. 1.8). Anxiety disorders were also more common among women within the 12-months (OR = 2.0; χ^2 = 3.3, df = 1, *P* = 0.05) and lifetime periods (OR = 2.0; χ^2 = 3.58, df = 1, *P* = 0.04).

Patients in an *inpatient setting* (acute inpatient and rehabilitation inpatient setting) showed a higher rate for comorbid mental disorders. However, the difference was only significant for the 4-weeks prevalence of anxiety disorders (OR 2.5; χ^2 = 3.6, df = 1, *P* = 0.04).

Although patients with *metastasised tumours* were somewhat less likely to have anxiety and more likely to have affective disorders, none of the calculated ORs was significant. In contrast, there was a significant correlation between *physical function* (dichotomised as high- and low-physical function, SF-36 subscale) and the rate of mental illness: in the 4-weeks interval, patients with a low physical function were more likely to have a mental

disorder on the whole (OR 2.3; χ^2 = 5.8, df = 1, *P* = 0.02), as well as anxiety (OR 2.5; χ^2 = 4.1, df = 1, *P* = 0.03) and affective disorders (OR 2.8; χ^2 = 4.1, df = 1, *P* = 0.04) in particular.

4. Discussion

To our knowledge, this study is the first with a relatively large-patient sample, which has documented the prevalence rates of different mental disorders (affective, anxiety, substance-related disorders, etc.) using the fully standardised CIDI analogous to epidemiological population studies (up until now, only one study has been conducted in a small sample of 22 patients [34]). With this procedure, a simultaneous documentation of the frequency of mental disorders in different, explicitly defined prevalence time periods (4 weeks, 12 months,

Table 4
Rates of DSM-IV psychiatric disorders observed in 200 cancer patients

Disorders	4-weeks prevalence *n* (%)	12-months prevalence *n* (%)	Lifetime prevalence *n* (%)
Total	47 (23.5)	80 (40.0)	113 (56.5)
Affective disorders	19 (9.5)	35 (17.5)	52 (26.0)
Anxiety disorders total	26 (13.0)	41 (20.5)	61 (30.5)
(in need of treatment)	15 (7.5)	23 (11.5)	39 (19.5)
Somatoform pain disorders	5 (2.5)	15 (7.5)	32 (16.0)
Substance-related disorders	5 (2.5)	10 (5.0)	33 (16.5)
Eating disorders	2 (1)	3 (1.5)	5 (2.5)
Schizophrenia and other psychotic disorders	0 (0)	2 (1.0)	8 (4.0)

Table 5
Rates of specific psychiatric disorders in 200 cancer patients

Disorders	4-weeks prevalence (%)	12-months prevalence (%)	Lifetime prevalence (%)
Affective disorders			
Major depression	1.5	4.5	9.0
Major depression (recurrent)	2.5	3.5	5.5
Dysthymia	4.0	5.0	5.0
Mood disorder due to a medical condition	1.5	4.5	6.0
Anxiety disorders			
Specific phobia	7.5	12.0	16.5
Panic disorder/agoraphobia	3.0	5.5	10.0
Social phobia	1.5	2.0	3.0
Generalised anxiety disorder (GAD)	0.0	1.0	4.0
Post-traumatic stress disorder (PTSD)	1.5	1.5	2.0
Obsessive-compulsive disorder	1.0	1.0	2.0
Others	1.5	2.0	4.0
Substance-related disorders			
Alcohol abuse/dependence	0.5	1.5	6.0
Nicotine-dependence	2.0	3.5	13.0
Others	0.5	0.5	1.5

lifetime) was possible. The interview procedure permitted a reliable documentation of mental disorders in view of the DSM-IV and proved to be practical for the examination of cancer patients.

To have a valid estimation of the psychiatric morbidity, an extended sample of relevant treatment settings for the care of tumour patients was examined (acute inpatient, rehabilitation inpatient, and outpatient treatment). In a cross-sectional design, patients were first interviewed by means of valid screening instruments regarding mental burden. In a second step, approximately 40% of the patients were tested by means of standardised clinical interview procedures (CIDI) for the documentation of psychiatric diagnoses.

The mental burden of patients examined with the HADS was, viewing the 17% on the subscale depression with the same cut-off ($\geqslant 11$), higher than in comparable surveys with large samples (e.g. 9% [27], 3.5% [35]). There was, however, a similar burden caused by anxiety symptoms [27,35–38]. The high burden scores of the interviewed patients and those examined with questionnaire only proved that these samples were highly comparable (no selection of higher burdened patients), thereby improving the generalisation of the study results.

Data for the two prevalence time periods of mental disorders (4 weeks and 12 months) which were documented in Germany within the same time period enabled an optimal comparison and a quantitative, as well as qualitative, classification of the results. In the German health survey [39,40], the prevalence of mental disorders (4-weeks and 12-months prevalence) was documented in a representative sample of more than 4000 probands in the general population, using the same instruments (CIDI), in a comparable time period (1998–1999). Comparing these data in the 4-weeks interval, the tumour patients had approximately a one third higher prevalence of mental disorders in our study (23.5% versus 17.3% in the health survey) [39,40]. With regard to the 12-months interval, the prevalence of psychiatric disorders was increased by 25% (40% versus 32.1% in the health survey) [39,40]. These differences in the prevalence rates between the clinical sample and the general population can be partly explained by the increased prevalence of affective and anxiety disorders. These higher current prevalence rates in our study compared with the German health survey are also due to the fact that we had more females in the study sample. It is well known that women have a 2-fold risk of mental disorders compared with men [39,40,42]. Indeed, the prevalence rate of women for any current mental disorder in the studies of Wittchen and colleagues were 22.8% [40]. This percentage is similar to our rate of 25.0% for any current mental disorder of female patients (men: 18.5%). However, the 12-months prevalence rates for any mental disorder were none the less higher in our study in both

women (42.5% versus 34.0% in the health survey) and men (33.3% versus 27.7% in the health survey) [39].

The 12-months rates for substance-related (6.0%) and somatoform disorders (7.5%) were slightly lower than in the study of Wittchen and colleagues, where 6.8% of the probands reported substance-related disorders, and 11% somatoform disorders [39,40]. Similar low rates for substance-related disorders in cancer patients are also known from other studies [41]. The tendency of patients to dissimulate or trivialise has to be considered in the CIDI as a possible interpretation of these low rates. There is no convincing reason why cancer patients should be less burdened by substance-related disorders than people in the general population [41]. An alternative explanation could be that cancer patients often give up unhealthy behaviour (smoking, consumption of alcohol) and for that reason may have a lower prevalence rate. It is more likely, however, that the preponderance of females in the study sample is responsible for the lower rates because women generally have less substance-related disorders [39,40,42].

The frequency of affective disorders in the cancer patients correspond with Anglo-Saxon studies, conducted by clinical interview, which reported increased prevalence rates of cancer patients in comparison with people in the general population. The frequency of current (4-weeks and 12-months interval) and lifetime affective disorders (major depression and dysthymia) in our study was approximately 25–30% higher than rates of these disorders documented in studies of the general population in Germany, as well as in the USA [39,42,43]. Furthermore, the rates of affective disorders, especially of major depression and dysthymia, were similar to those in Anglo-Saxon studies conducted via clinical interview ([1,3]; see also [16]).

The 25–33% increase of mental disorders in our sample in comparison to the German general population was markedly lower than the increased rates for mental disorders which were reported in former Anglo-Saxon studies [1,2,5]. They were also lower than the rates of mental disorders in epidemiological surveys of patients with other chronic diseases [12,44,45]. The results of the studies more likely support the hypothesis that mental disorders in cancer patients, with the exception of affective and anxiety disorders, are generally not more frequent than in the general population, as demonstrated by van't Spijker and colleagues in their meta-analysis [9]. One explanation for the lower prevalence of mental disorders in our study in comparison with former studies may be that by using the interview procedure (CIDI) the diagnosis of adjustment disorders was not possible. These were responsible in the study of Derogatis and colleagues for 32% of all psychiatric diagnoses [1]. A specific analysis of our patients with depressive symptoms, however, identified 31% of the

sample who fulfilled the research criteria for a minor depressive disorder (at least two, but less than five affective symptoms). This new DSM-IV category is, regarding the severity, very similar to the category of adjustment disorders [46]. Thus, an effort should be made to develop a supplementing CIDI module to enable the diagnosis of adjustment disorders in chronic somatic diseases.

However, the prevalence especially of simple phobias was higher than in comparable studies with cancer patients and other epidemiological surveys [1,40,42,47]. A meta-analysis [9] also showed that cancer patients are not burdened to a greater extent by anxiety disorders than people in the general population. This difference could be due to the fact that the fully standardised interview (CIDI) questions the full range of anxiety disorders (especially simple phobias) in detail. However, in an open clinical-psychiatric interview, as in studies by Derogatis [1] and others, the clinical relevance of current disorders is possibly more emphasised. Accordingly, the prevalence of current anxiety disorders was reduced from 13.0 to 7.5% in our study if only anxiety disorders in need of treatment were taken into consideration.

The analysis of potential risk factors (gender, tumour stage, physical impairment, treatment setting) showed a higher prevalence of mental disorders in female patients, as well as in individual disorder groups (affective and anxiety disorders). The data also corresponded, with the large epidemiological studies linking female gender and mental disorders [40,42,43]. It is possible that our results are less confounded by other variables (age differences, differences in type of tumour and prognosis) and interestingly, a low prevalence of mental disorders has been observed in studies which exclusively examined women (mainly breast cancer patients) [9]. An explanation for our similar results relating to gender to those in epidemiological population surveys could be that we were able to examine a broad age group, different tumour types and patients in different treatment settings, i.e. a representative cross-section of the population of tumour patients. The fact that women showed an approximately seven times higher risk of having an affective disorder at the 4-weeks time period deserves special clinical attention. Further research is also needed regarding the higher risk for inpatients of having mental disorders, especially anxiety disorders compared with the outpatients. Thus, the evaluation of differences in the support systems for in- and outpatients and the effects of the setting on coping processes could result in new information.

The correlation of the severity of tumour disease, referred to as physical impairment, and the frequency of mental disorders were in accordance with former studies ([2]; see also [16]). The correlation was less definite when viewing the current severity (i.e. existing metastases).

Apparently, the subjective assessment of the patient regarding physical function or impairment is a better predictor for depression and anxiety than the objective somatic impairment. It needs to be clarified in which way the severity of cancer disease or the physical function can be used in future studies. It should also be taken into consideration that the time of the survey (e.g. before or after the end of treatment) can be of importance in the study of correlations between severity of disease and the presence of mental disorders.

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