On the Descriptive Validity of ICD-10 Schizophrenia: Empirical Analyses in the Spectrum of Non-Affective Functional Psychoses

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Abstract

In order to examine the descriptive validity of ICD-10 schizophrenia, 1,476 consecutively admitted in-patients were included in the present study. ICD-10 schizophrenia (n = 951) was compared with other non-affective psychotic disorders [persistent delusional disorders (n = 51), acute and transient psychotic disorders (n = 116) and schizoaffective disorders (n = 354)] with respect to socio-demographic, symptomatological and other clinical parameters. Analyses revealed that it is possible to distinguish schizophrenia from other non-affective psychotic disorders according to ICD-10 criteria: schizophrenic patients were characterised by more pronounced negative symptoms and a lower global functioning. They were younger than patients with persistent delusional disorders and schizoaffective disorders but older than patients with acute and transient psychotic disorders. The results are in line with a high descriptive validity of ICD-10 schizophrenia and highlight the importance of negative symptoms for this diagnosis.

Introduction

More than 100 years ago, Kraepelin [1] divided functional psychoses into 'dementia praecox', and 'manic-depressive insanity'. K. Schneider [2] reinforced this strict dichotomous classification. His famous book *Clinical Psychopathology* had a great influence on the psychiatric classification. However, K. Schneider's [2] dichotomous classification was criticised for example by Strömgren [3] because K. Schneider [2] did not mention the concept of reactive psychoses, which was seen as an own entity separated from schizophrenia. Strömgren [4] claimed that these psychoses should be separated strictly from schizophrenia because there are great differences between them, not only with regard to the clinical picture but also prognosis and required treatment. In contrast to schizophrenia, reactive psychoses are usually not associated with a chronic course. Apart from the Scandinavian tradition of reactive psychoses, other authors developed further diagnostic concepts, such as schizoaffective psychoses [5], schizophreniform psychoses [6] and cycloid psychoses [7, 8]. In spite of several differences, these diverse labels all denote psychotic disturbances with a brief duration and remitting course, which are often associated with an acute onset after psychosocial stressors [9].

Neither the ICD-10 nor the DSM-IV follow K. Schneider's [2] dichotomous classification, but divide functional, non-affective psychotic disorders into a variety of different subgroups. In ICD-10, these disorders are classified in schizophrenia (F20), persistent delusional disorders (F22), acute and transient psychotic disorders (F23) and schizoaffective disorders (F25). This classification has its roots in the historical concepts mentioned above. Acute and transient psychotic disorders are in the tradition of the concept of reactive psychoses, schizoaffective disorders are in the tradition of Kasanin's [5] concept and persistent delusional disorders have their origin in Kraepelin's [1] 'paranoia', a separate category for pure delusional psychoses. In order to improve reliability and validity, in ICD-10, diagnostic groups are operationalised by descriptive criteria such as mode of onset, duration of symptoms, prominence of affective symptoms, presence of hallucinations and bizarre thinking or behaviour [10].

However, the principal question is whether or not ICD-10 schizophrenia can be distinguished from the other non-affective psychotic disorders. In the present study, descriptive validity will be investigated with regard to the patients' sociodemographic background, symptomatological picture and other clinical parameters. A similar analysis for DSM-III was published by Fabrega et al. [11]. The present study focuses on a large and representative sample of in-patients from a university hospital, thus allowing determination of the sociodemographic and clinical similarities and differences of ICD-10 schizophrenia and other non-affective psychotic disorders. The study tries to answer the following three questions.

(1) Do patients with an ICD-10 diagnosis of schizophrenia differ sociodemographically from patients with other non-affective psychotic disorders?

(2) Do ICD-10 schizophrenic patients display a different symptomatological picture than patients with other non-affective psychotic disorders?

(3) Do ICD-10 schizophrenic patients differ from other non-affective psychotic patients with respect to other clinical parameters?

Methods

The study was conducted in the Psychiatric Hospital of the Ludwig-Maximilians University, Munich, Germany. All consecutively admitted in-patients of the years 1995–1999 with the diagnosis of schizophrenia (F20), persistent delusional disorders (F22), acute and transient psychotic disorders (F23), schizoaffective disorders (F25) or other non-organic psychotic disorders/unspecified non-organic psychoses (F28, F29) were included in the study. Therefore, the study refers to a representative sample of in-patients admitted to a university psychiatric department. Diagnoses were made by well-experienced resident psychiatrists according to the clinical descriptions and diagnostic guidelines for ICD-10 [12], and rater trainings were regularly performed.

Psychopathological characteristics were prospectively assessed in a standardised manner by using the AMDP system. The ratings were performed on the day of admission and at discharge. Psychopathological rater trainings were regularly performed to establish a high interrater reliability. The AMDP system was developed in Europe by the Association for Methodology and Documentation in Psychiatry in order to standardise the assessment of psychopathological symptoms, and is a comprehensive rating instrument that includes more than 200 items. It is based on traditional descriptive psychopathology and covers all psychopathological manifestations of functional psychoses [13]. With the items 'delusional perception', 'hearing of voices', 'thought broadcasting', 'thought withdrawal', 'thought insertion' and 'other experience of influence', the AMDP system covers important first-rank symptoms according to K. Schneider [2]. Each item of the AMDP system can be graduated on a 4-point (0–3) scale. Pietzcker et al. [14] extracted several psychopathological syndromes by using the principal component analysis of the AMDP ratings. For the purpose of the present study, the summary scores of the paranoid-hallucinatory, manic and depressive syndromes [14] and the negative syndrome [15] were calculated.

Psychosocial functioning was recorded by the Global Assessment Scale (GAS) [16]. This is an internationally well-known single-dimension rating scale for the evaluation of the overall functioning of a subject on a continuum, from severe psychiatric illness (rated 0) to health (rated 100). The GAS has 10 behavioural definitions, 1 for each 10-point interval. It is not influenced by consideration of prognosis, previous diagnosis, or the presumed nature of the underlying disorder.

Information about sociodemographic parameters such as age, marital status, social class (according to Hollingshead and Redlich) and other clinical parameters such as duration of illness (time since first occurrence of psychopathological symptoms) and presence of psychosocial stressors prior to hospitalisation were derived from the hospital's computerised documentation system. The documentation of these data is operationalised.

Differences between diagnostic groups for continuous variables were evaluated using the t test. Group differences for all categorical variables were evaluated using the χ^2 test. A p value of <0.05 (2-tailed) was considered as statistically significant.

Results

Sample

Over the years 1995 to 1999, a total of 1,476 in-patients [788 females (53.4%) and 688 males (46.6%)] were included in the study. The mean age ± SD of the female patients was 41.7 ± 13.6 years, and of the male patients 34.6 ± 11.9 years. Nine hundred and fifty-one patients (64.4%) were diagnosed with schizophrenia (F20), 51 (3.5%) with persistent delusional disorder (F22), 116 (7.9%) with acute and transient psychotic dis-

Table 1. Differences between ICD-10 schizophrenia and other psychotic disorders with respect to sociodemographic parameters

	Schizophrenia (F20) (n = 951)	Persistent delusional disorders (F22) (n = 51)	Acute and transient psychotic disorders (F23) (n = 116)	Schizoaffective disorders (F25) (n = 354)
Age[1], years	37.1 (±13.3)	46.5 (±15.4)	34.4 (±10.8)	42.1 (±12.5)
t		−4.836	2.446	−6.120
Significance		*p < 0.001*	*p = 0.016*	*p < 0.001*
Gender (female), %	47.3	47.1	51.7	71.2
χ^2		0.001	0.804	59.124
Significance		p = 0.971	p = 0.370	*p < 0.001*
Marital status, %				
Single	65.8	34.1	48.2	38.2
Married/stable partnership	20.3	43.9	37.5	44.2
Separated/divorced	11.2	17.1	14.3	12.7
Widowed	2.6	4.9	0	4.8
χ^2		18.168	21.702	86.474
Significance		*p < 0.001*	*p < 0.001*	*p < 0.001*
Social class, %				
Higher (Hollingshead 1–3)	61.5	65.0	79.2	79.5
Medium (Hollingshead 4)	21.9	30.0	17.0	15.5
Lowest (Hollingshead 5)	16.5	5.0	3.8	5.0
χ^2		4.364	15.874	38.708
Significance		p = 0.113	*p < 0.001*	*p < 0.001*

[1] Figures in parentheses indicate mean ± SD.

orders (F23), 354 (24.0%) with schizoaffective disorders (F25) and 4 (0.3%) with other non-organic psychotic disorders/unspecified non-organic psychoses (F28, F29). Because of its small size, the last group was not included in the statistical evaluation.

Do Patients with an ICD-10 Diagnosis of Schizophrenia Differ Sociodemographically from Patients with Other Non-Affective Psychotic Disorders?

The comparison of demographical parameters revealed the following results (table 1). Patients with ICD-10 schizophrenia differed significantly from the other three groups of non-affective psychotic disorders (persistent delusional disorders, acute and transient psychotic disorders and schizoaffective disorders) with respect to age and marital status. Schizophrenic patients were more often single than patients with other non-affective psychotic disorders. They were younger than patients with persistent delusional disorders and schizoaffective disorders but older than patients with acute and transient psychotic disorders.

Furthermore, the proportion of female patients in the group of ICD-10 schizophrenia was lower than in the group of patients with schizoaffective disorders. A smaller percentage of the patients with ICD-10 schizophrenia were in a higher social class than of those with acute and transient psychotic disorders or schizoaffective disorders. On the other hand, compared with the other three groups of non-affective psychotic disorders, a higher percentage of patients with ICD-10 schizophrenia were in the lowest social class. However, the differences between patients with ICD-10 schizophrenia and those with persistent delusional disorders did not reach statistical significance.

Do ICD-10 Schizophrenic Patients Display a Different Symptomatological Picture than Patients with Other Non-Affective Psychotic Disorders?

The comparison of the mean values of the total scores of the depressive, manic, paranoid-hallucinatory and negative syndromes (table 2) revealed the following results. Patients with ICD-10 schizophrenia differed significantly from patients with other non-affective psychotic disor-

Table 2. Differences between ICD-10 schizophrenia and other psychotic disorders with respect to the symptomatological picture

	Schizophrenia (F20) (n = 951)	Persistent delusional disorders (F22) (n = 51)	Acute and transient psychotic disorders (F23) (n = 116)	Schizoaffective disorders (F25) (n = 354)
Admission				
First-rank symptoms, %	60.1	41.2	52.6	42.5
χ^2		7.142	2.393	32.133
Significance		*p = 0.008*	p = 0.122	*p < 0.001*
Par.-hall. syndrome	7.9 (±6.7)	7.9 (±6.3)	7.5 (±6.0)	5.1 (±5.3)
t		−0.107	0.441	7.828
Significance		p = 0.915	p = 0.659	*p < 0.001*
Negative syndrome	9.7 (±5.2)	4.6 (±3.9)	7.3 (±4.4)	7.8 (±5.7)
t		6.814	4.758	5.484
Significance		*p < 0.001*	*p < 0.001*	*p < 0.001*
Depressive syndrome	4.8 (±4.5)	5.4 (±5.2)	5.4 (±4.5)	8.3 (±6.6)
t		−0.951	−1.328	−9.070
Significance		p = 0.342	p = 0.185	*p < 0.001*
Manic syndrome	2.0 (±2.9)	1.5 (±2.4)	2.5 (±3.0)	4.0 (±4.8)
t		1.116	−1.526	−7.005
Significance		p = 0.244	p = 0.127	*p < 0.001*
Discharge				
First-rank symptoms, %	18.8	13.7	2.6	4.2
χ^2		0.813	19.159	42.888
Significance		p = 0.367	*p < 0.001*	*p < 0.001*
Par.-hall. syndrome	1.7 (±3.1)	2.6 (±3.5)	0.2 (±0.8)	0.3 (±1.1)
t		−1.796	11.824	11.478
Significance		p = 0.780	*p < 0.001*	*p < 0.001*
Negative syndrome	4.2 (±1.4)	1.4 (±2.0)	1.4 (±1.7)	1.7 (±2.4)
t		9.175	13.596	13.633
Significance		*p < 0.001*	*p < 0.001*	*p < 0.001*
Depressive syndrome	1.2 (±2.0)	0.9 (±1.5)	0.8 (±1.8)	1.1 (±2.0)
t		0.875	1.761	0.871
Significance		p = 0.382	p = 0.780	p = 0.384
Manic syndrome	0.6 (±1.2)	0.3 (±0.8)	0.1 (±0.4)	0.8 (±1.8)
t		1.144	7.277	−2.159
Significance		p = 0.360	*p < 0.001*	*p = 0.031*

Figures in parentheses are mean ± SD. Par.-hall. = Paranoid-hallucinatory.

ders with respect to the mean total score of the negative syndrome both at time of admission and discharge. Mean total scores of the negative syndrome were higher in schizophrenic patients than in patients with other non-affective psychotic disorders.

First-rank symptoms according to K. Schneider [2] ('delusional perception', 'hearing of voices', 'thought broadcasting', 'thought withdrawal', 'thought insertion' or 'other experience of influence') were common in all diagnostic groups. They did not allow differentiation between ICD-10 schizophrenia and the other three groups of non-

Table 3. Differences between ICD-10 schizophrenia and other psychotic disorders with respect to other clinical parameters

	Schizophrenia (F20) (n = 951)	Persistent delusional disorders (F22) (n = 51)	Acute and transient psychotic disorders (F23) (n = 116)	Schizoaffective disorders (F25) (n = 354)
GAS at admission	37.4 (±14.1)	48.3 (±14.3)	40.8 (±17.7)	41.7 (±15.6)
t		−5.339	−1.994	−4.531
Significance		*p < 0.001*	*p = 0.048*	*p < 0.001*
GAS at discharge	58.3 (±15.1)	66.8 (±14.2)	70.9 (±13.9)	68.3 (±13.3)
t		−3.982	−8.608	−11.688
Significance		*p < 0.001*	*p < 0.001*	*p < 0.001*
Psychosocial stressors prior to hospitalisation, %	16.4	24.4	34.8	25.7
χ^2		1.792	22.368	13.750
Significance		p = 0.181	*p < 0.001*	*p < 0.001*
Duration of illness, years	12.6 (±12.8)	12.3 (±17.6)	5.2 (±10.1)	13.3 (±13.1)
t		0.163	6.9	−0.789
Significance		p = 0.871	*p < 0.001*	p = 0.430

Figures in parentheses are mean ± SD.

affective psychotic disorders. However, at the time of admission, these symptoms were more frequent in schizophrenic patients than in patients with persistent delusional and schizoaffective disorders. At the time of discharge, first-rank symptoms were more frequent in schizophrenic patients than in patients with acute and transient psychotic disorders and schizoaffective disorders.

Apart from the differences mentioned above, at the time of admission, ICD-10 schizophrenia showed a higher mean total score for the paranoid-hallucinatory and a lower mean total score for the depressive and manic syndromes compared with schizoaffective disorders. A similar result was also found for the paranoid-hallucinatory and the manic syndromes at discharge. Compared with patients with acute and transient psychotic disorders, schizophrenic patients showed higher mean total scores for the paranoid-hallucinatory and manic syndromes at discharge.

Do ICD-10 Schizophrenic Patients Differ from Other Non-Affective Psychotic Patients with Respect to Other Clinical Parameters?

The diagnostic groups were compared with respect to global functioning at admission and discharge, measured with GAS rating, presence of psychosocial stressors prior to hospitalisation and duration of illness (time since first occurrence of psychopathological symptoms; table 3).

In comparison with other non-affective psychotic disorders, patients with ICD-10 schizophrenia showed a lower global functioning (mean value in GAS rating) both at admission and discharge.

Psychosocial stressors prior to hospitalisation were less frequent in patients with schizophrenia than in those with acute and transient psychotic disorders and schizoaffective disorders. However, no significant differences were found between schizophrenia and delusional disorders with regard to psychosocial stressors prior to hospitalisation. Furthermore, patients with schizophrenia had a longer duration of illness than patients with acute and transient psychotic disorders. However, the duration of illness in patients with delusional or schizoaffective disorders was comparable with patients with schizophrenia.

Discussion

The aim of the present study was to investigate the descriptive validity of ICD-10 schizophrenia. The crucial question is whether it is possible to distinguish schizophrenia from other non-affective psychotic disorders, as suggested in ICD-10 and DSM-IV, or whether it is more appropriate to follow K. Schneider's [2] broad concept of schizophrenia and talk about 'schizophrenia spectrum disorders', like Angst and Scharfetter [17]. For this reason, ICD-10 schizophrenia was compared with other non-

affective psychotic disorders of ICD-10 (persistent delusional disorders, acute and transient psychotic disorders, schizoaffective disorders) with regard to sociodemographic background, symptomatological picture and other clinical parameters.

Differentiation between Schizophrenia and Other Non-Affective Psychotic Disorders

In the study sample of 1,476 consecutively admitted in-patients, 64.4% received a primary diagnosis of schizophrenia, 3.5% of persistent delusional disorder, 7.9% of acute and transient psychotic disorders, 24.0% of schizoaffective disorders and 0.3% of other non-organic psychotic disorders/unspecified non-organic psychoses. These data reflect the frequency of ICD-10 diagnoses in the clinical practice of a university psychiatric department. Compared with other psychiatric hospitals in Germany [18], a higher frequency of patients with schizoaffective disorders and a lower one of patients with schizophrenia was found. This difference may be due to the special conditions of a university psychiatric department.

The major result of the present study was that it is possible to distinguish ICD-10 schizophrenia from other non-affective psychotic disorders. Similar findings were reported by Fabrega et al. [11] for DSM-III schizophrenia. However, this statement is restricted by the fact that ICD-10 field trials revealed a high interrater reliability for schizophrenia, persistent delusional disorders and acute and transient psychotic disorders, but only a moderate one for schizoaffective disorders [19]. Schizophrenia is the psychotic disorder that is characterised by more pronounced negative symptoms and a lower global functioning in comparison with other psychotic disorders in ICD-10. Schizophrenic patients were more often single persons than those with other non-affective psychotic disorders. They were younger than patients with persistent delusional disorders and schizoaffective disorders, but older than patients with acute and transient psychotic disorders. However, the study design does not allow to give an answer to the question discussed by Häfner et al. [20] whether these parameters (age, marital status, negative symptoms, global functioning) are independent from each other or not.

Impact of Positive Symptoms

The results show that it is not possible to sufficiently distinguish ICD-10 schizophrenia from the other non-affective psychotic disorders by so-called 'positive symptoms' [21]. Similar findings were reported by Fabrega et al. [11] for psychotic disorders in DSM-III. Neither the paranoid-hallucinatory syndrome nor the first-rank symptoms according to K. Schneider [2] allowed a differentiation between ICD-10 schizophrenia and the other groups of non-affective psychotic disorders. Although first-rank symptoms were most common in ICD-10 schizophrenia, the differences were not statistically significant when ICD-10 schizophrenia was compared with acute and transient psychotic disorders at admission and persistent delusional disorders at discharge. However, the definitions of first-rank symptoms in the AMDP are not identical with K. Schneider's [2] original phenomenological descriptions and may invite to a superficial assessment of false-positive symptoms [10]. The high frequency of first-rank symptoms in persistent delusional disorders is due to the symptom 'delusional perception'. In contrast to the ICD-10 diagnostic criteria for research [22], this symptom is no explicit exclusion criterion for the diagnosis of a persistent delusional disorder in the clinical descriptions and diagnostic guidelines of ICD-10 [12].

The results of the present study are in line with those from Peralta and Cuesta [23], who examined 660 patients with functional psychoses according to DSM-III-R criteria and found that first-rank symptoms do not have any diagnostic significance for schizophrenia relative to other psychotic disorders like schizophreniform disorders, schizoaffective disorders or brief reactive psychoses. These findings are not surprising because K. Schneider [2] never intended that his first-rank symptoms should distinguish between schizophrenia and other non-affective psychotic disorders, but only between 'schizophrenia' and 'cyclothymia' (affective disorders). He claimed that one 'has to speak about schizophrenia', if one can find any first-rank symptom in the absence of an organic brain disease.

Impact of Negative Symptoms

However, the results of the present study highlight the importance of negative symptoms for the diagnosis of ICD-10 schizophrenia. With respect to the clinical picture, only the negative syndrome allows one to distinguish between ICD-10 schizophrenia and other non-affective psychotic disorders. The results are in line with those from other studies, which have shown that with regard to negative symptoms, there are significant differences between schizophrenia and schizoaffective disorders (ICD-10) [24] as well as between schizophrenia and schizophreniform disorders (DSM-III) [25]. Although these symptoms have already been described by Kraepelin [1] and Bleuler [26], the concept of negative symptoms became more popular after 1980 [21, 27]. Several studies have shown that pronounced negative symptoms are associated

with an unfavourable course and worse social functioning in schizophrenic patients [28–30]. The results of the present study are in line with these findings because, in addition to pronounced negative symptoms, the group of schizophrenic patients was characterised by lower global functioning and a higher frequency of single persons than the groups of other non-affective psychotic disorders. This is also compatible with the Scandinavian tradition. In contrast to K. Schneider [2], the Scandinavian concept of schizophrenia, often referred to as 'nuclear schizophrenia' or 'process schizophrenia' [31], is narrower because it usually considers schizophrenia as a chronic disorder, separate from reactive psychoses [4, 32].

Limitations and Conclusions

The results of the present study provide some evidence for a high descriptive validity of ICD-10 schizophrenia. According to Feinstein [33], diagnostic systems should be investigated not only with respect to descriptive or internal validity but also to external validity. Validation is internal if one uses parameters that are part of the diagnostic judgement, such as the psychopathological picture or previous course of illness. For an external validation, it is necessary to test diagnostic groups with respect to parameters that are not available at the time of diagnostic judgement. The most common form of external validation is the investigation of future course and outcome (predictive validity). The present study is limited by its cross-sectional design. Until now, only a few studies have analysed the predictive validity of schizophrenia in comparison with other non-affective psychotic disorders according to ICD-10 criteria in a longitudinal design [34–38]. These investigations provide some evidence that ICD-10 schizophrenia is associated with a more chronic course and unfavourable outcome than other non-affective psychotic disorders. The division of psychotic disorders into different diagnostic subgroups, as suggested in ICD-10, seems to have a prognostic impact. However, it is necessary to perform further studies to expand the empirical data base in this field of psychiatric research.

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