

Diagnostic Criteria in Psychiatry: A Comparative Study Between Medical Record, ICD-9 and DSM-III Diagnoses in Bahrain

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ABSTRACT

The case notes of all patients discharged from the Psychiatric Hospital in Bahrain in one year were reviewed and diagnosed according to the ICD-9 and DSM-III criteria. The data were then compared with the medical record diagnoses and with each other. A similar, acceptable degree of agreement was found between the medical record diagnoses and those of ICD-9 and DSM-III systems. When both systems were compared using Spearman's coefficient of rank correlation, a good degree of correlation was found between them but DSM-III was found to have a much higher intra-rater reliability.

In spite of all the deficiencies and drawbacks of the classifications of psychiatric diagnoses, criticisms levelled at them were exaggerated at times and not fully warranted at others. The importance of diagnosis for both researchers and clinicians alike cannot be overemphasized because of the need for a common medium of communication through which they can exchange knowledge and experience about the disorders for which they share professional responsibility. An accurate diagnostic formulation is a prerequisite for the proper planning of any treatment programme. Comparing the efficacy of the latter can be achieved only if clearly defined diagnostic criteria are used to describe the different patients' groups¹.

Because of our present limited knowledge about aetiology and underlying pathology of psychiatric disorders, most psychiatric illnesses are classified on the basis of their clinical symptoms. The most commonly used classification systems in psychiatry are the International Classification of Diseases

(ICD) of the World Health Organisation (WHO) and the Diagnostic and Statistical Manual of Mental Disorders (DSM) of the American Psychiatric Association.

The ICD was designed originally for the classification of morbidity and mortality information for statistical purposes. Mental disorders were not included in the ICD until its fifth revision (1938) when these were included in the section on "Diseases of the Nervous System and Sense Organs". The sixth revision (ICD-6, 1948) had a separate section for mental disorders. Every decade, after extensive international consultations, WHO publishes a new revision of the ICD, but it was only in the 1960's and after the introduction of the ICD-8 and its glossary of definitions that WHO expended great effort to persuade health ministers and national psychiatric associations throughout the world to use the ICD classification². In spite of all the pressure and even after the appearance of the ICD-9 in 1977, a majority of psychiatrists seem unimpressed by the ICD classification and continued to use their own classifications^{3,4,5,6}.

Many explanations could be given for the failure of ICD system to satisfy the needs of psychiatrists, but at that point the hope was still there that, with persistence and continued nosological research within each country, and internationally, the major barriers that stand in the way of arriving at a reliable international classification of psychiatric disorders would be overcome. Just at that time the American Psychiatric Association launched the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III). It is true that DSM-III tries to

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maintain a link with the ICD-9 by a cross reference system, but it would have been surely more beneficial if any changes introduced could have obtained international endorsement first, so that a unified system could have been maintained⁷.

The DSM-III represents an attempt to reflect the current state of knowledge about mental disorders. The major innovations of the DSM-III include the use of a descriptive approach so that different disorders are grouped according to objective clinical features, using an explicit principle of classification and an extensive description of each disorder with both inclusive and exclusive criteria with a multiaxial system of classification⁸. With all these innovations, all attempts were made to keep maximum compatibility with ICD-9, so that future comparisons can be made^{9,10}.

This study was done as a part of a quality assurance programme that was undertaken jointly by the Psychiatric Hospital and the Office of Professional Standards and Systems Analysis (OPSSA) in the Ministry of Health. The main purpose of the study was to examine and improve the medical record system at the Psychiatric Hospital; however, we decided to use the available data in conducting our comparative study between ICD-9 and DSM-III in clinical settings in order to determine which is more reliable and useful in our practice.

METHOD

All patients discharged from the Psychiatric Hospital in one year were identified by the medical information system prepared by OPSSA. An abstract form was designed to include information about the patients' demographic data as well as the symptoms of 11 psychiatric diagnoses defined by DSM-III (Table 1). The DSM-III definitions were used because they are more comprehensive and have both inclusion and exclusion criteria. The residents at the Psychiatric Hospital were trained by one of the authors, to check the symptoms on the abstract form while reviewing the medical notes without writing the diagnosis. The forms were then examined by the authors, independently and blindly, recording diagnoses on each form using the ICD-9 and DSM-III criteria.

The medical record, the ICD-9, and the DSM-III diagnoses were then compared with each other.

TABLE I

DSM-III Diagnostic Categories Included in the Study

1. Eating Disorders
2. Organic Mental Disorders
3. Substance Use Disorders
4. Schizophrenic Disorders
5. Paranoid Disorders
6. Affective Disorders
7. Anxiety Disorders
8. Somatoform Disorders
9. Dissociative Disorders
10. Adjustment Disorders
11. Personality Disorders

Kendall's coefficient of concordance, "W", was used to measure the degree of concordance in diagnosis between the three systems, and Spearman's coefficient of rank correlation, "P", was applied for each two groups of diagnostic systems¹¹. Ties were corrected for the two methods. To validate the diagnoses arrived at by the authors, a simple random sample of 50 abstract forms was selected and reviewed again by each author without prior knowledge of the first diagnosis. A comparison was then made between the first and second diagnoses.

RESULTS

In 1981, a total of 432 patients were discharged from the hospital, 74 of whom were excluded because of being diagnosed as epileptic, mentally retarded or non-psychiatric. Hence, a total number of 358 patients were included in the study. Table 2 shows the number and percentage of patients in each major 3-digit medical record, ICD-9 and DSM-III diagnostic category. If more than one diagnoses were given, only the primary diagnosis was recorded. The diagnostic categories were then ranked according to the most frequently diagnosed condition. Table 3 shows the ranks assigned to the 17 diagnoses according to medical record, ICD-9 and DSM-III diagnoses. Appendix 1 shows the results of calculation of Kendall's coefficient of concordance to these ranks and Appendix 2 shows the calculations of Spearman's coefficient of rank correlations for them. Table 4 shows the degree of agreement between the first and second sample diagnoses of ICD-9 and DSM-III.

TABLE 2
Distribution of Diagnoses by Classification System

<i>DIAGNOSIS</i>		<i>Medical Record</i>		<i>ICD-9</i>		<i>DSM-III</i>	
<i>Code</i>		<i>No</i>	<i>%</i>	<i>No</i>	<i>%</i>	<i>No</i>	<i>%</i>
290	Senile and presenile organic psychotic conditions	3	0.84	8	2.23	6	1.68
291	Alcoholic psychosis	1	0.28	2	0.56	2	0.56
292	Drug psychosis	2	0.56	0	0	1	0.28
293	Transient organic psychotic conditions	2	0.56	2	0.56	0	0
294	Other organic psychotic conditions	5	1.40	0	0	0	0
295	Schizophrenic psychosis	182	50.84	170	47.49	118	32.96
296	Affective psychosis	29	8.10	74	20.67	68	18.99
298	Other non-organic psychosis	4	1.12	0	0	0	0
299	Psychosis with origin specific to childhood	1	0.28	0	0	0	0
300	Neurotic disorders	34	9.50	14	3.91	12	3.35
301	Personality disorders	12	3.35	2	0.56	2	0.56
303	Alcohol dependence syndrome	29	8.10	30	8.38	30	8.38
304	Drug dependence	13	3.63	17	4.75	15	4.19
308	Acute reaction to stress	1	0.28	0	0	0	0
309	Adjustment reaction	2	0.56	4	1.11	1	0.28
311	Depressive disorders not elsewhere classified	26	7.26	0	0	0	0
350	No diagnosis	12	3.35	35	9.78	103	28.77
Total		358	100.00	358	100.00	358	100.00

TABLE 3
Diagnostic Criteria Study
Ranks Assigned to 17 Diagnoses by Medical Record,
ICD-9 and DSM-III Criteria

Code of DX Criteria	290	291	292	293	294	295	296	298	299	300	301	303	304	308	309	311	NO DX
Medical Record	11	16	13	13	9	1	3.5	10	16	2	7	3.5	6	16	13	5	8
ICD - 9	7	10	14.5	10	14.5	1	2	14.5	14.5	6	10	4	5	14.5	8	14.5	3
DSM - III	7	8.5	10.5	14.5	14.5	1	3	14.5	14.5	6	8.5	4	5	14.5	10.5	14.5	2
Rj	25	34.5	38	37.5	38	3	8.5	39	45	14	25.5	11.5	16	45	31.5	34	13

TABLE 4
Agreement between First and
Second Sample Diagnoses

	Correct	Incorrect	% Correct
ICD-9 Diagnoses	33	12	76
DSM-III Diagnoses	48	2	96

DISCUSSION

As mentioned before, this study had two main purposes: to examine and improve the medical record system and secondly, to compare ICD-9 and DSM-III criteria on an Arabic-speaking population.

Overall, the results were encouraging as regards to the medical record system. The system had been geared to use ICD-9 criteria, and as seen in Tables 2&3 and Appendices 1&2, there has been a reasonable agreement between medical record diagnoses, not only with the ICD-9 system but also with the DSM-III, and with $P < 0.01$. On the other hand, there has been a marked shift in the distribution of diagnoses in certain categories which demands comment. The discrepancy in the number of cases in categories 290 and 294 can be corrected if the cases classified as 294 are reclassified under one of the organic psychotic diseases (290) as no special diagnostic investigations were performed to rule them out. The increase in the number of cases diagnosed

as schizophrenia (295) in the medical records over those in ICD-9 is not as significant as it is between the former and DSM-III. This is mainly due to the more strict nature of DSM-III classification system, but it can also be partly explained by the fact that the medical records diagnoses are presumably based on ICD-9 classifications and that both ICD-9 and DSM-III diagnoses were assigned to the patients by a more trained and experienced senior staff member and based on the information in the abstract forms rather than on actual interviews of patients. Depression poses a special and a rather difficult problem. As a major symptom, it can be classified under ten 3-digit and nineteen 4-digit categories in ICD-9. Table 2 shows a significant increase in the number of cases diagnosed as "affective disorders" from 29 in the medical records to 74 and 68 in ICD-9 and DSM-III respectively. This discrepancy may be due to the absence of cases diagnosed as "depression not elsewhere classified" (311) in both ICD-9 and DSM-III. The 26 cases who received the latter diagnosis in the medical records may have been classified under "affective disorders" (296) in ICD-9 and DSM-III. Moreover, some of the cases originally diagnosed as "neurotic disorders" (300) and "personality disorders" (301) in the medical records may have been rediagnosed as "affective disorders" (296) by the ICD-9 and DSM-III. On the other hand, all of those cases who received the diagnosis of "depression not elsewhere classified" and "other non-organic psychosis" (298) in the medical records, together with some cases from other categories, may have been classified under "no psychiatric diagnosis"

in the ICD-9 and DSM-III systems. This explains the increase in the number of cases classified under this diagnostic category in the latter two systems over those in medical records. These findings seem to be in line with those reported by Zigmond and Sims¹²

DSM-III and ICD-9 differ greatly in their classification of affective disorders. Maier, Philipp and Buller were able to show these differences in their study on a sample of 173 depressed inpatients¹³. The results of our study do not lend support to these findings. On the contrary, there was a close agreement between the number of cases diagnosed to be suffering from affective disorders (296) in both ICD-9 and DSM-III; 74 and 68 respectively. However, the data that were available to us from the notes in the medical records were only sufficient to make 3-digit ICD-9 or DSM-III diagnoses while it is essential to use the 4-digit diagnoses to show the differences.

In the comparison of ICD-9 and DSM-III, our data seem to support Spitzer's claim that the two systems are compatible and that the differences in diagnostic categories that exist between them are not as extensive as would appear at first glance¹⁰. Table 2 shows a total agreement between the two systems in

8 out of 17 categories and very close agreement in another 6 categories.

Only 3 categories, namely, schizophrenic disorders (295), adjustment disorders (309), and "no diagnosis" showed clear differences. Such differences can be explained by the fact that DSM-III is known to use a much stricter and narrower definition of schizophrenia, whereas the medical records are more geared to the ICD-9 than to the DSM-III criteria. Thus, many of the cases diagnosed as schizophrenia in the medical records and by ICD-9 received no diagnosis under DSM-III. The number of cases having the diagnosis of adjustment disorders was small, and can therefore be ignored. When Spearman's coefficient of rank correlation was calculated to test the discrepancy, a very high degree of correlation was found with $P = 0.94$ and $t = 10.6768$, significant at $p < 0.001$.

CONCLUSIONS

This high degree of correlation between the two systems along with our findings in Table 4 showing 96% agreement between the two diagnoses in DSM-III compared with only 76% in ICD-9 lead us to recommend DSM-III as a more accurate and reliable system of diagnosis in clinical settings.

APPENDIX 1

Kendall's Coefficient of Concordance "W"

$$W = \frac{S}{\frac{1}{12} m^2 (N^3 - 3) - m \sum T}$$

where $S = \sum (R_j - \frac{R_j}{N})^2$, R_j being the rank sum of the j th

individual and T , the correction factor applied because of tie ranks.

We have $N = 17$, $m = 3$, $\sum T = 42.5$, and $\sum R_j = 418.5$.

Thus $W = 0.8456$

Since $N > 7$, we apply a X^2 test to determine the critical value of W .

$$\begin{aligned} X^2 &= m(N-1) W \\ &= 40.5888 \end{aligned}$$

which implies a significant association at 1% level.

APPENDIX 2

Spearman's Coefficient of Rank Correlation " ρ "

$$\rho = 1 - \frac{6 \sum d^2}{N(N^2 - 1)} \quad \text{where } d \text{ and } N \text{ have their usual meanings.}$$

Since $N > 10$, we test the significance of ρ using a test given by

$$t = \rho \sqrt{\frac{N - 2}{1 - \rho^2}}$$

1. **For Medical Record vs ICD - 9**, the observed value of ρ is 0.6483 with critical t value 3.2978 which we find to be significant at 0.01 level.
2. **For Medical Record vs DSM - III**, the observed ρ is 0.6471. We determine the critical value of t to be 3.2871 which is also significant at 0.01 level.
3. **Finally for ICD - 9 vs DSM - III**, the observed ρ is 0.9400 and the critical value of t is 10.6768 which is significant at 0.001 level.

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