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Reliability assessment of the Polish version of the Groningen Social Disabilities Schedule II (GSDSII)

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Summary

The paper describes a reliability study conducted on the Polish version of the Groningen Social Disabilities Schedule II (GSDSII). 127 inpatients hospitalized in the Department of Psychiatry of the Medical University of Wrocław were included in the study. Each patient was assessed by two raters (interrater and retest reliability) who were assigned to the roles of interviewer and observer in a balanced, randomized way. Several statistical indices of reliability were calculated for the interviewer-observer and retest comparison. The interview showed an overall good reliability. The lowest values were found for those items where the reference group expectations were relationship-dependent.

Keywords: social disability, scales, reliability, GSDSII

Introduction

A growing need and demand for establishing standards aimed at effective short- and long-term evaluation of the psychosocial functioning and dysfunction in area of mental health care services and insurance system imposes implementation of research tools with proved psychometric properties. In the mainstream of the studies on social disabilities international research on the psychometric properties of the first version of the Groningen Social Disabilities Schedule (GSDS) scale has been performed in the mixed population of psychiatric inpatients, outpatients and hostel clients in the Netherlands [1, 2]. The improved, semi-structured second version in English (GSDSII) has been tested for interrater reliability in the World Health Organization Collaborative Project on 'Psychological Problems in General Health Care' [3] and in the EDEN study, in the international population of psychiatric in- and day-hospital patients [4, 5]. As a result of the EDEN study problems concerning cultural and language contexts emerged.

This is the report on the part of the studies concerning psychometric properties of the Polish version of the Groningen Social Disabilities Schedule II (GSDSII), a semi-structured interview based upon the hierarchy of social disabilities and the social role theory, psychometrically verified in different mental health care and primary care settings [1, 2, 3].

Aim and Methods

GSDSII has been translated and adapted to the Polish conditions in the Department of Psychiatry at the Medical University of Wrocław, altogether with the user manual. The interviewers – registrars in psychiatry – underwent training in GSDSII usage during the course of the European Day Hospitals Evaluation Study (EDEN), a multi-centre research project launched in the framework of the 5th Horizontal Program of the European Union. The interviewers analyzed and discussed case reports, case vignettes and inter-centre reliability was assessed.

The research group included 127 inpatients, hospitalized in the Department of Psychiatry at the Medical University of Wrocław, 73 women and 69 men, aged 20-69 years (mean 42.6 years). Patients were recruited randomly according to the order of their admission. The informed consent has been obtained from all the patients. The exlusion criteria were: cognitive impairment which made it impossible to accumulate sufficient data from the patient (dementia, delirium), lack of informed consent or cooperation.

Patients underwent testing with GSDSII during the first week after admission. The period of assessment encompassed 4 weeks before admission. The inter-rater reliability by the two raters (interviewer and observer, each time blinded) was performed in a randomized way. The test-retest reliability with repetition after minimum 48 hours was assessed. For the analysis of interrater agreement weighted Kappa coefficient (Kw) by Cohen and Intraclass Correlation Coefficient (ICC) [6, 9] were used. Internal consistency with Cronbach alfa coefficient [8, 10], principal component analysis with the method of screeplot and factor analysis were performed [7, 10].

Results

Test-retest reliability ranged from 0.55 to 0.89 for the weighted kappa and from 0.69 to 0.94 for ICC, which means sufficient to almost perfect agreement [1, 2, 6]. The results are comparable to that of a similar population [1, 2] and slightly lower than the scores obtained in the primary health care population [3].

However, being enough for group comparisons (outcome research, cost-effectiveness studies), it may be difficult to apply it adequately to the individual on disability benefit in order to monitor precisely psychosocial dysfunction (norms for individuals > 0.9) (Tab. 1).

Similar results were obtained for inter-rater reliability according to the above mentioned scoring. Results concerning quality of relationships in dimensions A of several roles tended to be in slightly lower agreement than in test-retest. The problem of low kappa agreement concerning the second role, specially the dimension 2A, results rather from the outstanding asymmetry of scores in terms of prevalence of moderate and severe disability, confirmed by high index of percentage concordance (0.89%) (Tab. 2).

Table 1

Test-retest reliability for role scores (1-8 T) and dimension scores (A, B, C, D)

N	Role	Po (%)	Kappa, C	icc	Kw	ci, K, left	ci, K, right
80	1-2.1A	0.76	0.65	0.83	0.74	0.51	0.79
80	1-2.1B	0.83	0.70	0.83	0.76	0.56	0.84
80	1-2.1T	0.80	0.70	0.84	0.76	0.56	0.83
80	1-2.2A	0.93	0.72	0.75	0.73	0.50	0.94
79	1-2.2B	0.73	0.60	0.78	0.69	0.45	0.75
8	1-2.2C	0.88	0.79	0.88	0.83	0.42	1.17
80	1-2.2T	0.81	0.62	0.74	0.67	0.44	0.79
62	1-2.3A	0.74	0.62	0.81	0.70	0.45	0.78
62	1-2.3B	0.71	0.58	0.80	0.68	0.41	0.74
72	1-2.3C	0.79	0.67	0.81	0.73	0.52	0.82
77	1-2.3T	0.79	0.66	0.79	0.72	0.51	0.81
35	1-2.4A	0.80	0.70	0.84	0.76	0.50	0.90
33	1-2.4B	0.88	0.82	0.94	0.89	0.66	0.99
41	1-2.4C	0.88	0.80	0.92	0.86	0.64	0.96
79	1-2.4T	0.80	0.70	0.85	0.77	0.56	0.83
44	1-2.5A	0.77	0.66	0.83	0.74	0.47	0.84
43	1-2.5B	0.77	0.65	0.73	0.69	0.46	0.84
44	1-2.5T	0.68	0.50	0.71	0.60	0.29	0.72
80	1-2.6A	0.75	0.64	0.82	0.73	0.51	0.78
76	1-2.6B	0.93	0.87	0.90	0.89	0.77	0.98
80	1-2.6C	0.94	0.84	0.88	0.86	0.71	0.97
80	1-2.6T	0.81	0.69	0.78	0.73	0.55	0.83
80	1-2.7A	0.73	0.62	0.80	0.71	0.48	0.75
80	1-2.7B	0.83	0.75	0.83	0.79	0.64	0.87
80	1-2.7T	0.79	0.69	0.84	0.76	0.55	0.82
24	1-2.8A	0.75	0.62	0.86	0.74	0.36	0.88
55	1-2.8B	0.87	0.73	0.81	0.77	0.55	0.92
24	1-2.8C	0.58	0.40	0.69	0.55	0.12	0.69
79	1-2.8D	0.82	0.73	0.87	0.80	0.60	0.86
80	1-2.8T	0.83	0.69	0.83	0.75	0.55	0.84

N – number of patients; Po – percentage agreement; kappa C – kappa coefficient; ICC – intracorrelation coefficient; Kw – weighted kappa; ci, kappa, left – confidence interval left; ci, kappa, right – confidence interval right

Table 2

Inter-rater reliability for role scores (1-8 T) and dimension scores (A, B, C, D)

N	Rol3	Po (%)	kappa,C	icc	Kw	ci,K,left	ci,K,right
98	1-3.1A	0.84	0.76	0.89	0.82	0.65	0.87
98	1-3.1B	0.87	0.77	0.84	0.80	0.65	0.89
98	1-3.1T	0.86	0.79	0.90	0.84	0.69	0.89
98	1-3.2A	0.89	0.48	0.52	0.49	0.19	0.77
96	1-3.2B	0.70	0.57	0.66	0.61	0.44	0.70
11	1-3.2C	0.82	0.73	0.87	0.79	0.40	1.07
98	1-3.2T	0.79	0.62	0.70	0.65	0.48	0.77
75	1-3.3A	0.85	0.78	0.89	0.83	0.66	0.90
75	1-3.3B	0.75	0.64	0.82	0.73	0.50	0.78
89	1-3.3C	0.76	0.62	0.78	0.69	0.47	0.76
95	1-3.3T	0.80	0.70	0.84	0.77	0.58	0.82
52	1-3.4A	0.73	0.61	0.80	0.70	0.43	0.78
50	1-3.4B	0.84	0.74	0.92	0.84	0.58	0.90
45	1-3.4C	0.82	0.72	0.82	0.77	0.55	0.90
98	1-3.4T	0.74	0.62	0.79	0.70	0.49	0.74
56	1-3.5A	0.75	0.59	0.79	0.69	0.40	0.77
55	1-3.5B	0.76	0.63	0.78	0.70	0.46	0.81
56	1-3.5T	0.77	0.64	0.75	0.69	0.47	0.81
98	1-3.6A	0.70	0.59	0.78	0.68	0.46	0.71
95	1-3.6B	0.94	0.86	0.95	0.91	0.75	0.97
98	1-3.6C	0.90	0.71	0.79	0.75	0.54	0.88
97	1-3.6T	0.77	0.63	0.78	0.70	0.50	0.77
97	1-3.7A	0.70	0.58	0.74	0.67	0.45	0.71
97	1-3.7B	0.75	0.65	0.71	0.68	0.53	0.77
97	1-3.7T	0.82	0.74	0.81	0.77	0.63	0.85
28	1-3.8A	0.79	0.67	0.87	0.77	0.44	0.91
68	1-3.8B	0.85	0.68	0.85	0.76	0.50	0.86
26	1-3.8C	0.65	0.52	0.81	0.67	0.26	0.77
97	1-3.8D	0.75	0.63	0.76	0.69	0.50	0.76
98	1-3.8T	0.83	0.73	0.83	0.77	0.60	0.85

N – number of patients; Po – percentage agreement; kappa C – kappa coefficient; ICC – intracorrelation coefficient; Kw – weighted kappa; ci, kappa, left – confidence interval left; ci, kappa, right – confidence interval right

The internal consistency of the scale has been assessed with Cronbach alpha. The sufficient consistency has been assessed for all the three ratings [8, 10]. The deletion of roles did not result in an increase in consistency coefficient, pointing at the significant and strong input of all roles in the structure of the scale. On the contrary, the decrease in Cronbach alpha in ratings made by deletion of the roles 5, 6 and 7 may suggest a particularly strong contribution of the three roles to the consistent structure of GSDSII (Tab. 3).

Table 3

Consistency coefficient (Cronbach alpha) for GSDSII measurements

Role	GSDS1	GSDS2	GSDS3
All 8 roles	0.75	0.77	0.73
Without role 1	0.73	0.77	0.71
Without role 2	0.73	0.74	0.70
Without role 3	0.74	0.74	0.72
Without role 4	0.76	0.76	0.72
Without role 5	0.70	0.70	0.65
Without role 6	0.72	0.73	0.71
Without role 7	0.71	0.74	0.70
Without role 8	0.74	0.76	0.73

To elucidate the existence of factors underlying research areas the principal component analysis (PCA) with the "screeplot" method was performed. It proved the presence of the outstanding component with eigenvalue 1.35. To interpret the meaning of components the factor analysis with varimax rotation was performed. For the whole group of patients the one-factor solution with moderate factor loadings and total variance amounting to 30% for total role scores and the three factors explaining 48% of total variance were obtained (Tab. 4a).

Table 4a

Factor analysis for the whole group N=127 (three-factor solution with total variance 48%). Factor loadings min. 25%

Role	Factor 1	Factor 2	Factor 3
1	0.75		
2	0.56		
3			0.50
4			0.48
6	0.58		
7		0.93	
8	0.34		0.30

Factor one included individual functioning (care, home activity, interests), factor 2 concerned social contacts, factor 3 – the family and partner role. Analysis in subgroups taking account of the role 5 elicited a 4 factor-solution with large factor loadings and 60% of total variance for people having children and 3-factor solution with 59% of total variance for people without children.

In the factor analysis by dimensions a difficulty in reducing number of factors has been confirmed. Because of the categorical division in partner and parental role (4 and 5), it was impossible to include them in the global factor analysis of roles. Factor analysis by dimensions revealed three-factor solution with a cumulative variance of 43% (4B). The three calculated factors may be to some degree interpreted as: factor 1 - social disability with 6B and 6C dimensions excluded, factor 2 – work disability, factor 3 – family relationships. Further analysis revealed a seven-factor solution explaining 70% of the total variance with roles-related factors (4C). It is worth noting that dimensions 6b did load onto a separate factor.

Table 4b

Factor loadings by dimensions (N=127); three-factor solution with cumulative variance 0.43

Role	Factor 1	Factor 2	Factor 3
1A	0.48		
1B	0.42		
2A			0.43
2B	0.76		
3A			0.51
3B			0.94
6A	0.48	0.36	
6B			
6C			
7A	0.70		
7B	0.96		
8B		0.78	
8D		0.53	

Discussion

GSDSII ratings within the EDEN project were performed with written vignettes, but without the opportunity to ask additional, clarifying questions, which is a big advantage of this semi-structured instrument [4]. Reliability scores were satisfying for dichotomous evaluation (presence or absence of disability) but disclosed weaker results for 4-point ordinal scale in roles and dimensions. This was especially observed for the items related to the socio-cultural background, social perception and expectations as was the case for dimension 6B (participation in societal groups, organizations and\or clubs) and for the occupational role [5]. In the presented study these differences no

Table 4c

Factor loadings by dimensions (N=68); seven-factor solution

Dimension	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
1a	0.936						
1b	0.621						
2a				0.712			
2b			0.450	0.569			
3a							0.753
3b							0.560
6a					0.948		
6b						0.923	
6c		0.412					
7a		0.736					
7b		0.690					
8b			0.479		0.344		
8d			0.836				

	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7
SS loadings	1.448	1.325	1.293	1.235	1.152	1.023	0.944
Proportion Variance	0.111	0.102	0.099	0.095	0.089	0.079	0.073
Cumulative Variance	0.111	0.213	0.313	0.408	0.496	0.575	0.648

longer exist in terms of affecting reliability scores. Yet, the item 6B presumably bears impact upon the factor structure (see below). However, in dimension 8C (contacts with others) in the retest reliability a remarkable agreement decrease has been observed in the employed group (containing predominantly persons suffering from anxiety and mood disorders), suggesting ambivalent attitude of patients to their work environment in its more subjective aspect. According to the notes made by raters, the discrepancy may result from variable overestimation of maladjustment at work, with the focus on isolation and emotional distance in patients with depression and frequent negligence of the lack of conflicts. Over-reporting of malfunctioning is in concordance with literature data [12].

The principal component analysis revealed the presence of one predominant component, which could account for the social disability concept. However, results of factor analysis enabled no direct interpretation, in concordance with research of Wiersma et al. [1, 2]. Separate factor for partner role may suggest a presence of some disturbances in the hierarchical structure of the scale caused by patient responses. In factor analysis for calculable dimensions there was a trend towards role-related factors. Interestingly, dimension 6C merged with the social role. Dimension 6B coming up as an independent factor may be explained by statements of many patients on their

relatively well-preserved church service activities as the main area tested in that dimension in polish socio-cultural background. Protective effect of balanced religiosity with weekly church attendance against depression was previously reported [13]. On the contrary, high levels of general religiosity were associated with increased risk of anxiety disorders [14].

Limitations of the study

One of the limitations of the study is homogeneity of the research group, which included patients with moderate or severe impairment (psychotic and mood disorders) and moderate to mild impairment (anxiety disorders). Therefore the short-term impairment-related disability evaluation with GSDSII may in some cases interfere with long-term disability estimation. Another point is that although blinded, assessments made by two raters may be exposed to some degree of rating bias.

Conclusions

1. Polish version of the GSDSII scale is a reliable research instrument which may be reasonably applied in similar psychiatric populations.
2. Semi-structured version supported by interview with informant is strongly indicated for the proper and reliable usage.

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