

The World Health Organization Short Disability Assessment Schedule (DAS-s): A validation study in patients with schizophrenia

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Abstract

Purpose: The World Health Organization Short Disability Assessment Schedule (DAS-s) is used for patients with schizophrenia even though no validation is available. This paper addresses this issue by dealing with its psychometric properties in a clinical sample of patients with schizophrenia.

Methods: Two hundred forty-one patients from 10 Adult Mental Health Care Centres (AMHCC) meeting the following inclusion criteria were included: 1) International Classification of Diseases-10 or ICD-10 diagnosis of schizophrenia; 2) Global Assessment of Functioning scores or $GAF \leq 50$; 3) Illness duration of more than 2 years; and 4) Clinical stability at assessment time. Patients were evaluated at baseline and at one-year follow-up regarding disability, socio-demographic and clinical variables, psychosocial measures and use of mental health services.

Results: The factor analysis revealed a single factor that explained 60.57% of the variance. Internal consistency values were appropriate for the DAS-s total (0.78 at baseline and 0.78 at one year follow-up). Correlations between DAS-s scores and those of global functioning, psychiatric symptoms, social support and quality of life ranged between small and moderate (range: 0.13-0.39). There were significant differences between groups of patients with schizophrenia in the DAS-s. Patients who were unemployed, with lower global functioning, with cognitive impairment and lacking social support scored significantly lower in DAS-s scores. After one year follow-up, there was a non-significant decrease in DAS-s scores and patients improved significantly in overall functioning and psychiatric symptoms.

Discussion: This study shows that the DAS-s has good reliability and validity, and suggests that it is suitable for the assessment of disability in patients with schizophrenia.

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1. Introduction

Disability is seen in impairments on daily life activities involving, for example, personal care, occupation and family and social relationships. Disability is present in mental health disorders and, particularly, in persons suffering from schizophrenia who, due to disability, may show difficulties in having a major life activity.[1;2] Taking into account these consequences, it is justified that disability would be an essential element of investigation and practice in the context of rehabilitation in patients with schizophrenia.[3]

The assessment of disability in rehabilitation is limited by the following factors[4]: 1) several measurement methods (i.e. self-report, hetero-report, performance based report, etc.), 2) ambiguity between disability and other related terms (i.e. functioning, living skills, incapacity, etc.) and 3) lack of agreement on the scope of its meaning. The World Health Organization developed the Short Disability Assessment Schedule or DAS-s[5] which is an instrument to assess disability in mental disorders that deals with the above mentioned limitations. It takes into account different sources of information and it provides a concise and cross-culturally agreed upon definition of disability based on the International Classification of Impairments, Disabilities and Handicaps.[6]

The DAS-s[5] is derived from the World Health Organization Psychiatric Assessment Schedule or DAS[7] which is a semi-structured interview developed for the assessment of disability of patients with mental disorders and, specifically, psychotic patients. It

was developed in two international field trials of the multiaxial presentation of the International Classification of Diseases-10 or ICD-10[8] and assesses problems in personal care, occupational tasks and functioning with regard to the social setting of the patient. It can be used in different settings such as medical practice, research or audit and is an international disability evaluation tool applicable across different cultures.[5]

Although no validation is available in patients with schizophrenia, the DAS-s has been used for the assessment of this patient population[9;10;11;12] because of its suitability, the aspects it covers and its psychometric properties with psychiatric patients.[5] This paper addresses the issue by validating this instrument in a clinical sample of outpatients with schizophrenia.

Firstly, we aim to establish its factor structure. The results of the dimensionality of the test will guide the rest of psychometric analyses. Secondly, we address the internal consistency of this scale. Thirdly, we deal with its convergent validity. Namely, we study DAS-s associations with clinical and psychosocial variables and disability differences between groups of patients with schizophrenia, established according to socio-demographic variables, global functioning, psychiatric symptoms and social support. As observed in previous studies, we expect to find a positive relationship between disability and psychiatric symptoms [13;14;15;16;17]; while finding a negative one between disability and social support,[18] quality of life[19] and measures of global functioning. McKibbin et al. (2004)[4] found, in general terms, no associations between disability and socio-demographic variables, while Alpetkin et al. (2005)[17] only found significant associations between disability and employment. We do not expect there to be significant differences between groups of patients with schizophrenia based on socio-demographic variables. Taking into account the above mentioned expected relationships, we expect to find disability differences between groups of patients with

schizophrenia, established according to global functioning, psychiatric symptoms and social support. Specifically, we expect to find that patients with higher global functioning, lower levels of psychiatric symptoms (i.e. depression, anxiety, insight and cognition) and higher social support will show lower levels of disability.

Finally, we aim to test the capacity of the DAS-s to detect changes over time and to establish its sensitivity to change after one-year follow-up. We anticipate significant improvements in perceived social support, global functioning, psychiatric symptoms, disability and quality of life in relation to community treatment provided to patients[20].

2. Methods

2.1. Sample

Patients came from 10 Adult Mental Health Care Centres (AMHCC) in Barcelona (Spain). These AMHCC are run by the Catalan Department of Health and share similar characteristics regarding the care provided to patients. They offer a care package to patients with schizophrenia by means of multidisciplinary community mental health teams (i.e. a psychiatrist, a psychologist, a community mental health nurse and a social worker). This care package involves medical and psychosocial interventions of varying intensity depending on patients' needs and is coordinated by one of the members of the mental health teams (i.e. a community mental health nurse).

From December 2006 to January 2008, these AMHCC participated in a study consisting of a one-year follow-up of patients in contact with services who met the following inclusion criteria: 1) Global Assessment of Functioning or GAF[21] scores of 50 or lower, 2) Illness length greater than 2 years, 3) ICD-10[8] diagnosis of schizophrenia and 4) Clinical stability at assessment time. Patients were excluded if they had

dementia, organic brain injury or mental retardation. Patients who visited consecutively and who met study inclusion criteria were asked to participate. Specifically, 260 patients met these inclusion criteria but 19 did not consent to participate. Data from this study was used in this paper.

The final sample comprised 241 (67.6% male) patients, their mean age was 41.7 years (SD = 11.6) and 72.6% of them had illness duration greater than 10 years; 70.5% of patients had a diagnosis of paranoid schizophrenia and 29.5% of other schizophrenias (i.e. 10.8% undifferentiated, 9.1% residual, 6.2% hebephrenic, 1.2% simple and 2.1% other). Other socio-demographic characteristics of patients are described in Table 1.

INSERT TABLE 1 HERE

A total of 219 patients (90.9%) were successfully evaluated at one-year follow-up. Sixteen people (out of 22) were not evaluated following their psychiatrist's instructions because they were not clinically stable at assessment time or did not have contact with services, 3 died (1 from terminal illness and 2 by suicide), 2 did not properly complete the evaluation and 1 dropped out of the study.

2.2. Instruments

Patients were evaluated at baseline and at one-year follow-up with the following assessment tools:

The DAS-s.[5] It is a semi-structured interview based on the clinician's assessment of the information obtained from the patient, caregivers, family, case notes and other records. It is derived from the DAS[7] and is composed of the following items[5]: 1) personal care, which refers to personal hygiene, dressing, feeding, etc.; 2) occupation, which refers to expected functioning in paid activities, studying, homemaking, etc.; 3)

family and household members, which refers to expected interaction with partner, parents, children, etc.; and 4) broader social context, which refers to expected performance in relation to community members, participation in social activities, etc. Each item is rated on a 6-point scale with the following anchor points: 0 = no disability at any time; 1 = deviation from the norms in the performance of one or more of the tasks or roles expected to be carried out by the patient in his or her cultural setting; 2 = deviation from the norms is conspicuous and dysfunction interfere with social adjustment (i.e. slightly disabled most of the time or moderately disabled some of the time); 3 = deviation from the norms in most of the expected tasks and roles; 4 = deviation from the norms in all of the expected tasks and roles; and 5 = deviation from the norms has reached a crisis point (i.e. the patient is severely disabled all of the time). The addition of all item scores provides an overall measure of disability.[9;11;12] The higher the score, the greater the disability perceived by the clinician. Besides the above mentioned items, there are also three other items not included in the scoring, but which the clinician needs to take into account when rating the DAS-s. First, time covered by the rating (i.e. current, last month, last year and other). Second, total duration of disability (i.e. less than one year, one year or more and unknown). Finally, specific abilities of the patient (i.e. presence and description).

The DAS-s was developed in the framework of the multiaxial presentation of the ICD-10.[5] It involved: 1) elaboration of a draft version by an international expert advisory group; 2) revision of the draft version by participants in the development of different versions of the ICD-10,[8] heads of WHO centres, the World Psychiatric Association, etc.; and 3) elaboration of the final version of the DAS-s based on the DAS.[7] During its development[5] the DAS-s showed good psychometric properties. The DAS-s intraclass correlation coefficients ranged from 0.40 for disability in family and

household activities to 0.74 for disability in personal care. Moreover, 50% of specific disability categories had kappa values higher than 0.50.

In this study the time covered in the rating was the last month.

The GAF.[21] This is a reliable and valid measure of global psychological functioning in patients with severe mental disorder. Its theoretical range is 1-100, where 100 denotes best possible functioning. It is included in the *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition* [21] or DSM-IV.

The Positive and Negative Syndrome Scale[22] or PANSS. This instrument is used for assessing symptom severity in patients with schizophrenia and it has been translated into and is validated in Spanish.[23] It assesses psychiatric symptoms in three domains: positive (theoretical range: 7-49 where 49 denotes higher levels of positive psychiatric symptoms), negative (theoretical range: 7-49 where 49 represents higher levels of negative psychiatric symptoms), general (theoretical range: 16-112; where 112 denotes higher levels of general psychiatric symptoms), and provides an overall measure of psychiatric symptoms (theoretical range: 30-210, where 210 means higher levels of psychiatric symptoms). Internal consistency values of its subscales range between medium and high and its convergent validity with other measures of psychiatric symptoms is high and ranges from 0.70 to 0.81.[23]

The Functional Social Support Questionnaire[24] or FSSQ. This is an eleven-item questionnaire that measures the strength of the patient's social network. It assesses perceived social support in two domains: confidential social support (theoretical range: 6-30, where 30 denotes higher levels of confidential social support) and affective social support (theoretical range: 5-25, where 25 represents higher levels of affective social support), and provides an overall measure of social support (theoretical range: 11-55,

where 55 shows higher levels of social support). It has also been translated into and validated in Spanish[25] and the reliability indexes are 0.80 and 0.92 for hetero-report and self-report, respectively. The concurrent validity with other health measures ranges in absolute values from 0.13 to 0.81.[25]

The World Health Organization Quality of Life Scale Brief Version [26] or WHOQOL-BREF. It is a short version of the World Health Organization Quality of Life Scale or WHOQOL-100, which is considered an international, cross-culturally analogous quality of life evaluation tool.[27] During its development, internal consistency values ranged from 0.66 to 0.84; and correlations with the WHOQOL-100 subscales ranged from 0.89 to 0.95.[27] Skevington et al. (2004)[28] confirmed and extended information about its properties and showed good to excellent psychometric properties. There is a Spanish version[29] that shows good psychometric properties in patients with schizophrenia.[30]

2.3. Procedure

The study was approved by the Ethics Committee of the Catalan Union of Hospitals in accordance with the ethical standards of the 1964 Declaration of Helsinki. The procedures and assessments were described to each patient who then provided informed consent.

The community mental health teams performed patient assessments. The diagnosis was established by the psychiatrist by means of a non-structured interview following ICD-10[8] research diagnosis criteria and considered self-reports and caregiver reports. The psychiatrist also carried out the assessment of psychiatric symptoms, while the rest of the assessments were performed by the other members of the community mental health teams under the psychiatrist's supervision. The psychiatrist was in charge of setting up

the assessment agenda, supervising its development and sending the score sheets to the psychologist in charge of the design and analyses of the study database.

To ensure the quality of data assessment, all psychiatrists participated in a schizophrenia diagnostic agreement workshop comprising two case vignettes. All researchers were trained in the administration of the instruments in a 4-hour session run by a psychologist with experience in psychological assessment of psychiatric patients. Systematic reviews of data coding and registration were taken and patient information was contrasted with data from the AMHCC responsible for each patient.

First, the psychiatrist conducted the assessment of global functioning and psychiatric symptoms with the GAF and the PANSS to check if patients met inclusion criteria. Then, the other members of the community mental health teams administered the rest of assessment tools in the following order: 1) DAS-s, 2) the WHOQOL-BREF and 3) the FSSQ.

After each evaluation, systematic reviews of data coding and registration were taken and patient information was contrasted with family interviews and AMHCC registered data.

2.4. Data analysis

Exploratory factor analysis (EFA) was performed using principal axis factoring. Factors were selected taking into account the following criteria: eigenvalues > 1 , the coefficient between the variance explained for the first factor and the second one, and the analysis of the scree plot.[31;32]

Internal consistency was evaluated by means of Cronbach's α and the contribution of DAS-s items to the overall α . The internal consistency was calculated at baseline and at

one-year follow-up. Cronbach's α values were considered as follows: $0.60 \leq \alpha < 0.80$ adequate, $0.80 \leq \alpha < 0.85$ good and $\alpha \geq 0.85$ excellent.[33]

To assess convergent validity,[34] Pearson's correlations between DAS-s scores at baseline and the GAF, PANSS, FSSQ and WHOQOL-BREF scores at baseline were calculated. Correlation values were considered as follows: 1) < 0.3 = small, 2) 0.3 to 0.5 = moderate and 3) ≥ 0.5 large.[35] T-tests and analysis of variance were used to analyze differences in DAS-s scores between groups of patients with schizophrenia. Patient groups were defined according to socio-demographic variables, low global functioning[21] (GAF scores ≤ 50), the presence of anxiety symptoms[22] (item 2 of PANSS general ≥ 4), depressive symptoms[22] (item 6 of PANSS general ≥ 4), lack of insight[22] (item 12 of PANSS general ≥ 4), cognitive impairment[22] (item 5 of PANSS negative ≥ 4) and lack of social support[25] (FSSQ ≤ 32).

T-tests for dependent samples were used to assess change over time between baseline and at one-year follow-up for DAS-s, GAF, PANSS, FSSQ and WHOQOL-BREF scores and AMHCC visits. The Bonferroni correction for multiple comparisons was applied[35] and a p value ≤ 0.003 was considered significant. The effect size was also estimated[36] and its values were considered as follows: 1) < 0.3 =small, 2) 0.3 to 0.5 =moderate and 3) ≥ 0.5 large.[37]

Differences between scores at baseline and at one-year follow-up were calculated for DAS-s scores, GAF, PANSS, FSSQ, WHOQOL-BREF scores and AMHCC visits. Sensitivity to change was determined by Pearson's correlation coefficients between DAS-s score differences and the other score differences.

Data were analysed using the *Statistical Package for the Social Sciences* v.15.

3. Results

3.1. Factor Analysis

The analysis of the correlation and anti-image matrices, and the results of the Kaiser-Meyer-Olkin measure of sampling adequacy (K-M-O=0.77; Barlett's Test of Sphericity: Chi-square=264.58, df=6, $p<0.0001$) showed that DAS-s data was appropriate to run the factor analysis. The EFA revealed a one-factor structure with an eigenvalue of 2.42, which explained 60.57% of the variance. Loadings of items from 1 to 4 were: 0.71, 0.80, 0.84 and 0.76, respectively.

3.2. Internal consistency

Internal consistency coefficients for DAS-s were 0.78 at baseline and 0.78 at one year follow-up. We also tested the change in Cronbach's alpha values when items are suppressed. The suppression of any of the items decreased internal consistency coefficients at baseline and at one-year follow-up (range: 0.01-0.09). Item suppression decreased Cronbach's alpha values by 0.09 as maximum, which may be considered negligible.

3.3. Convergent validity

Pearson's correlations between DAS-s scores and GAF, PANSS, FSSQ and WHOQOL-BREF scores at baseline were mostly significant, and ranged from 0.13 to 0.39 in absolute values (see Table 2). Specifically, correlations between DAS-s and GAF scores were negative and mainly small; correlations between DAS-s and PANSS scores were positive and ranged between small and moderate; correlations between DAS-s scores and FSSQ were negative and ranged between small and moderate, and correlations

between DAS-s and WHOQOL-BREF scores were negative and ranged between small and moderate.

Table 2 shows the differences in DAS-s scores for groups of patients with schizophrenia. There were no statistically significant differences in DAS-s scores between groups established according to socio-demographic variables except for employment status. Namely, active patients scored significantly lower than non-active patients in all DAS-s scores [DAS-s personal care: $t(101.06) = -3.082$ ($p=0.003$); DAS-s occupation: $t(239) = -6.575$ ($p<0.001$); DAS-s family and household: $t(104.79) = -3.623$ ($p<0.001$); DAS-s broader social context: $t(239) = -3.427$ ($p=0.001$); DAS-s total: $t(239) = -5.220$ ($p<0.001$)]. There were significant differences in DAS-s scores between groups of patients with schizophrenia established according to clinical functioning, social functioning, cognitive impairment and social support. In particular, patients with higher clinical functioning, higher social functioning, without cognitive impairment and higher social support scored significantly lower in almost all DAS-s scores.

INSERT TABLE 2 HERE

3.4. Changes over time

As shown in Table 3, DAS-s scores decreased over time, but not significantly. There were statistically significant changes over time regarding PANSS positive, PANSS negative, PANSS general, PANSS total, GAF clinical and GAF social scores. To be precise, there was a decrease in psychiatric symptoms as shown by changes in PANSS scores over time and an improvement in overall functioning as indicated by changes in GAF scores over time. Effect sizes were medium for most scores but small for GAF social scores. FSSQ scores and WHOQOL-BREF scores remained about the same over time. With regard to AMHCC visits, there were statistically significant changes over

time in nursing visits. Specifically, there was an increase in nursing visits with a small effect size. No other statistically significant differences over time were observed (See Table 3).

INSERT TABLE 3 HERE

3.5. Sensitivity to change

Firstly, score differences between baseline and one-year follow-up were calculated for DAS-s scores, the other assessment tools and AMHCC visits. Secondly, Pearson's correlation coefficients between DAS-s score differences and all other score differences were calculated. Table 4 shows that Pearson's correlations between changes in DAS-s scores and changes in GAF, PANSS, FSSQ, WHOQOL-BREF scores were mostly significant. Those coefficients ranged from 0.00 to 0.33 in absolute values. In particular, correlations between the change in DAS-s and the change in GAF scores were negative and ranged between small and moderate; correlations between changes in DAS-s and changes in PANSS scores were positive and small; correlations between changes in DAS-s and changes in FSSQ scores were negative and small; correlations between changes in DAS-s and changes in WHOQOL-BREF scores were mainly negative and small. As for AMHCC visits, there were no statistically significant correlations.

INSERT TABLE 4 HERE

4. Discussion

The aim of this study was to validate the DAS-s in patients with schizophrenia. The DAS-s showed suitable psychometric properties in this patient population.

The factor analysis revealed a single factor that explained a high percentage of variability. This supports the use of an overall measure as a sum of the 4 items of the

DAS-s.[9;11;12] Janca (1996)[5] suggested that the DAS-s items be scored individually taking into account a clinical criteria but not the factor structure of the scale. To our knowledge this is the first study that aims to establish its factor structure.

Internal consistency values at baseline and at one-year follow-up were adequate for the DAS-s total. During the development of the DAS-s,[5] the study of its psychometric properties was conducted using case vignettes and a sample of psychiatric patients recruited consecutively, and included content analyses and assessments of inter-rater reliability. The authors concluded that the DAS-s was useful, user-friendly and reliable. Our findings are an extension regarding the adequacy of the psychometric properties of the DAS-s.

We expected to find a positive relationship between disability and psychiatric symptoms[13;14;15;16;17]; while finding a negative one between disability and social support[18], quality of life[19] and global functioning. Those were the directional relationships of our findings, which have been found in other studies. Findings regarding the relationship between disability and psychiatric symptoms are controversial. Most authors show that there is a significant and positive relationship between disability and psychiatric symptoms, although some of them show that disability is associated only with negative symptoms,[13;16;15] some with both negative and positive symptoms[14] and others with psychiatric symptoms in general terms.[17] Our findings are consistent with the association between disability and psychiatric symptoms in general terms.

As observed in other studies,[4] we found significant and negative associations between disability, functioning and quality of life. In our study, we used the GAF for the assessment of functioning and the WHOQOL-BREF for quality of life. They both aim

to measure the functioning of persons in their own environment. This may explain why they show the greatest correlation coefficients with disability. With regard to perceived social support, the present study showed that perceived social support is related to community adaptation in the sense that the higher the social support perceived, the better the community adaptation.[38] One should think that the DAS-s is intended to measure patient adaptation in its own environment or, in other words, community adaptation. It is worth noting that disability and functioning were clinician-rated (DAS-s and GAF) while social support and quality of life were self-rated (FSSQ and WHOQOL-BREF). The fact that the raters are different may explain why the correlation coefficients of the latter variables were not as great as one would expect.[39]

There were no differences in DAS-s scores between groups of patients established according to socio-demographic variables, except for employment. Our findings have been observed in other studies. For instance, McKibbin et al. (2004)[4] found no association between socio-demographic characteristics (i.e. age, education, gender and ethnicity) and overall disability scores. When examining disability domains, McKibbin et al. (2004)[4] found some associations between disability and socio-demographic variables in a sample of older patients with schizophrenia. Our results are, in general terms, congruent with the above mentioned results, but we did not find associations between disability domains and socio-demographic variables. This could be related to the use of different tools to assess disability and to the specific characteristics of the samples included. For example, the mean age in the present study was lower than that in the research by McKibbin et al. (2004)[4]. Our results are also congruent with the results of Alpetkin et al. (2005)[17] which show no significant associations between disability and age, gender and marital status, but a significant association between disability and employment. Further research may involve the effects of

employment/occupational programmes in this sample population, which seem to lessen disability[40] and, also, extend the information about the relationship between disability and socio-demographic variables since other studies have found differences between DAS-s scores and socio-demographic variables such as gender.[9]

There were significant differences between patient groups. As expected, patients with lower functioning, cognitive impairment and lacking social support showed higher disability levels in almost all DAS-s scores. The findings about functioning and social support are congruent with the relationship stated for these variables with disability earlier in the discussion. As for cognitive impairment, our findings support a body of evidence that show a relationship between cognitive impairment and disability.[41;42;43] Although we also hypothesised disability differences between groups of patients established according to levels of depression,[4; 17] anxiety[44] and insight impairment,[45;46;47] our study did not find such associations. Even so, one should note that group differences may be unreliable since they were made according to established cut-offs of single scale items rather than through diagnostic interviews. Further research is needed to clarify the relationship between psychiatric symptoms and disability since, as already mentioned, it is controversial.

At one-year follow-up after the provision of care to patients through AMHCC,[20] we expected a decrease in disability and psychiatric symptoms and an increase in levels of general functioning, social support and quality of life. There were only improvements regarding psychiatric symptoms and global functioning together with an increase of community psychiatric nursing visits. We did not observe significant improvements regarding disability, social support or quality of life. This might somehow reflect the need for more specific psychosocial interventions aimed to improve disability, social support and quality of life.[48] The lack of changes in DAS-s scores at one year follow-

up might be one of the reasons why there are only small significant associations between changes in DAS-s scores between baseline and one year follow-up and changes in the rest of tests scores and AMHCC visits between baseline and one year follow-up.

To date, the DAS-s has been used for the assessment of patients with schizophrenia even though no validation of the scale is available. This paper provides evidence regarding the psychometric properties of the DAS-s in patients with schizophrenia. The DAS-s has good reliability and validity, which supports its use in this patient population. Taking all the above into account, it can be considered that the DAS-s could be used for the assessment of disability in patients with schizophrenia as an evaluation tool for purposes such as research or routine practice. Future research should involve psychometric properties in other sample populations, such as other mental disorders as well as other populations with disability.

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Table 1. Socio-demographic characteristics of the sample at baseline

Variable	N	%
Age Mean(SD)	41.71(11.60)	
Gender		
Female	78	32.4
Male	163	67.6
Illness duration		
< 5 years	24	10.0
From 5 to 10 years	42	17.4
> 10 years	175	72.6
Marital status		
Single	181	75.1
Living with partner or married	32	13.3
Divorced, separated or widowed	28	11.6
Educational level		
≤ Primary school	113	46.9
> Primary school	128	53.1
Living arrangement		
Family property	166	68.9
Other	45	31.1
Employment status		
Active	53	22
Non-active	188	78
Schizophrenia type		
Paranoid	170	70.5
Other	71	29.5

Table 2. Validity evidence of the DAS-s¹ for patients with schizophrenia

	DAS-s PERSONAL CARE	DAS-s OCCUPATION	DAS-s FAMILY AND HOUSEHOLD	DAS-s BROADER SOCIAL CONTEXT	DAS-s TOTAL
Association with clinical and psychosocial variables: (n=241) [r (p value)]					
GAF ² -clinical	-0.264 (p<0.001)	-0.306 (p<0.001)	-0.295 (p<0.001)	-0.308 (p<0.001)	-0.377 (p<0.001)
GAF-social	-0.217 (p<0.001)	-0.323 (p<0.001)	-0.320 (p<0.001)	-0.351 (p<0.001)	-0.390 (p<0.001)
PANSS ³ positive	0.223 (p<0.001)	0.128 (p=0.047)	0.290 (p<0.001)	0.166 (p=0.010)	0.259 (p<0.001)
PANSS negative	0.169 (p=0.008)	0.260 (p<0.001)	0.204 (p=0.010)	0.341 (p<0.001)	0.312 (p<0.001)
PANSS general	0.166 (p=0.010)	0.155 (p=0.060)	0.236 (p<0.001)	0.252 (p<0.001)	0.259 (p<0.001)
PANSS total	0.209 (p=0.001)	0.204 (p=0.001)	0.278 (p<0.001)	0.295 (p<0.001)	0.316 (p<0.001)
FSSQ ⁴ -total social support	-0.308 (p<0.001)	-0.223 (p<0.001)	-0.340 (p<0.001)	-0.264 (p<0.001)	-0.364 (p<0.001)
FSSQ-confidential support	-0.261 (p<0.001)	-0.184 (p=0.004)	-0.299 (p<0.001)	-0.270 (p<0.001)	-0.324 (p<0.001)
FSSQ-affective support	-0.295 (p<0.001)	-0.193 (p<0.001)	-0.307 (p<0.001)	-0.179 (p<0.001)	-0.313 (p<0.001)
WHOQOL-BREF ⁵ physical	-0.231 (p<0.001)	-0.267 (p<0.001)	-0.149 (p=0.021)	-0.303 (p<0.001)	-0.304 (p<0.001)
WHOQOL-BREF psychological	-0.231 (p<0.001)	-0.202 (p<0.001)	-0.216 (p=0.001)	-0.330 (p<0.001)	-0.312 (p<0.001)
WHOQOL-BREF social relations	-0.221 (p=0.001)	-0.186 (p=0.004)	-0.249 (p<0.001)	-0.307 (p<0.001)	-0.307 (p<0.001)
WHOQOL-BREF environment	-0.261 (p=0.001)	-0.253 (p=0.001)	-0.277 (p=0.001)	-0.321 (p=0.001)	-0.356 (p=0.001)
WHOQOL-BREF total	-0.295 (p<0.001)	-0.288 (p<0.001)	-0.274 (p<0.001)	-0.388 (p<0.001)	-0.398 (p<0.001)
Group differences: (n=241) [t test(p value)]					
Low clinical functioning vs. high clinical functioning	4.062 (p<0.001)	4.079 (p<0.001)	3.455 (p<0.001)	3.929 (p<0.001)	4.963 (p<0.001)
Low social functioning vs. high social functioning	2.802 (p=0.006)	4.718 (p<0.001)	3.788 (p<0.001)	4.320 (p<0.001)	5.018 (p<0.001)
Depressed vs. non depressed	-0.117 (p=0.907)	-0.537 (p=0.591)	-0.600 (p=0.549)	-2.282 (p=0.023)	-1.106 (p=0.270)
Anxious vs. non anxious	0.109 (p=0.913)	0.811 (p=0.420)	1.058 (p=0.291)	1.231 (p=0.222)	1.049 (p=0.362)
Insight impairment vs. non insight impairment	-1.485 (p=0.139)	-2.761 (p=0.006)	-2.216 (p=0.028)	-2.564 (p=0.011)	-2.931 (p=0.004)
Cognitive impairment vs. non cognitive impairment	-1.840 (p=0.067)	-3.055 (p=0.003)	-1.495 (p=0.136)	-3.473 (p=0.001)	-3.192 (p=0.002)
Lacking social support vs. having social support	-4.127 (p<0.001)	-3.410 (p=0.001)	-4.355 (p<0.001)	-3.633 (p<0.001)	-5.010 (p<0.001)

n= simple size at baseline

1. DAS-s: The World Health Organization Short Disability Assessment Schedule; 2. GAF: Global Assessment of Functioning; 3. PANSS: Positive and Negative Syndrome Scale; 4. FSSQ: Functional Social Support Questionnaire; 5. WHOQOL-BREF: World Health Organization Quality of Life Brief Version

Table 3. Clinical and psychosocial variables and use of health services at baseline and at one year follow-up

Measure	Baseline		1 year follow-up		Differences over time		
	Mean	SD	Mean	SD	t	p	ES
(n=219)							
DAS-s ¹ personal care	1.32	1.35	1.18	1.26	2.18	0.031	0.15
DAS-s occupation	2.72	1.54	2.59	1.58	-1.37	0.172	0.09
DAS-s family and household	2.05	1.48	2.01	1.45	0.56	0.579	0.04
DAS-s broader social context	3.00	1.37	2.81	1.45	-2.26	0.025	0.15
DAS-s total	9.09	4.46	8.59	4.46	2.37	0.018	0.16
PANSS ² positive	16.67	6.26	15.22	6.10	5.02	<0.001	0.32
PANSS negative	24.07	6.99	22.34	6.90	5.08	<0.001	0.33
PANSS general	42.35	12.73	39.22	12.30	5.30	<0.001	0.34
PANSS total	83.10	22.47	76.79	21.96	6.14	<0.001	0.38
GAF ³ clinic	47.07	9.69	49.58	11.01	-4.94	<0.001	0.32
GAF social	44.29	10.00	46.26	10.36	-3.45	<0.001	0.23
FSSQ ⁴ confidant support	16.55	4.99	16.37	5.17	0.63	0.531	0.00
FSSQ affective support	10.90	3.14	10.78	3.22	0.68	0.500	0.00
FSSQ total social support	36.68	9.47	36.57	9.72	0.22	0.823	0.02
WHOQOL-BREF ⁵ physical health	13.25	2.42	13.27	2.54	-0.95	0.924	0.01
WHOQOL-BREF psychological health	12.18	2.86	12.19	2.81	-0.01	0.990	0.00
WHOQOL-BREF social relationships	10.54	3.26	10.50	3.24	0.23	0.816	0.02
WHOQOL-BREF environment	13.24	2.26	13.31	2.36	-0.51	0.612	0.04
WHOQOL-BREF general	81.82	13.94	81.95	14.11	-0.18	0.856	0.01
AMHCC ⁶ psychiatric visits ^T	5.76	4.22	6.28	4.43	-1.75	0.082	0.12
AMHCC nursing visits ^T	5.92	7.13	8.38	9.03	-4.35	<0.001	0.28

1. DAS-s: The World Health Organization Short Disability Assessment Schedule; 2. PANSS: Positive and Negative Syndrome Scale; 3. GAF: Global Assessment of Functioning; 4. FSSQ: Functional Social Support Questionnaire; 5. WHOQOL-BREF: World Health Organization Quality of Life Scale Brief Version; 6. AMHCC: Adult Mental Health Care Centre

SD: standard deviation; ^T: Time frame= patient visits during the year prior to the first assessment versus patient visits during the year after the first assessment

Table 4. Sensitivity to change of the DAS-s¹ for patients with schizophrenia

	DAS-s PERSONAL CARE	DAS-s OCCUPATION	DAS-s FAMILY AND HOUSEHOLD	DAS-s BROADER SOCIAL CONTEXT	DAS-s TOTAL
Sensitivity to change (n= 219)					
[r (p value)]					
GAF ² clinical	-0.18 (p=0.008)	-0.09 (p=0.202)	-0.27 (p<0.001)	-0.15 (p<0.001)	-0.25 (p<0.001)
GAF social	-0.18 (p=0.009)	-0.10 (p=0.048)	-0.29 (p<0.001)	-0.28 (p<0.001)	-0.33 (p<0.001)
PANSS ³ positive	0.21 (p=0.002)	0.03 (p=0.702)	0.21 (p=0.002)	0.13 (p=0.050)	0.20 (p=0.003)
PANSS negative	0.13 (p=0.500)	-0.00 (p=0.989)	0.17 (p=0.012)	0.18 (p=0.006)	0.17 (p=0.010)
PANSS general	0.17 (p=0.012)	-0.09 (p=0.200)	0.15 (p=0.024)	0.15 (p=0.029)	0.13 (p=0.062)
PANSS total	0.20 (p=0.003)	-0.04 (p=0.527)	0.20 (p=0.003)	0.18 (p=0.007)	0.19 (p=0.006)
FSSQ ⁴ total social support	-0.06 (p=0.365)	-0.02 (p=0.736)	-0.16 (p=0.018)	-0.20 (p=0.002)	-0.17 (p=0.015)
FSSQ confidential support	-0.02 (p=0.766)	-0.02 (p=0.778)	-0.17 (p=0.010)	-0.19 (p=0.005)	-0.13 (p=0.050)
FSSQ affective support	-0.07 (p=0.297)	-0.08 (p=0.226)	-0.11 (p=0.100)	-0.13 (p=0.056)	-0.15 (p=0.028)
WHOQOL-BREF ⁵ physical	-0.12 (p=0.082)	-0.03 (p=0.710)	-0.19 (p=0.004)	-0.14 (p=0.043)	-0.15 (p=0.030)
WHOQOL-BREF psychological	-0.16 (p=0.019)	0.00 (p=0.949)	-0.18 (p=0.009)	-0.19 (p=0.004)	-0.19 (p=0.006)
WHOQOL-BREF social relation	0.05 (p=0.442)	-0.07 (p=0.291)	-0.27 (p<0.001)	-0.13 (p=0.065)	-0.16 (p=0.020)
WHOQOL-BREF environment	0.01 (p=0.907)	-0.02 (p=0.796)	-0.09 (p=0.175)	-0.18 (p=0.007)	-0.11 (p=0.112)
WHOQOL-BREF total	-0.10 (p=0.150)	-0.02 (p=0.791)	-0.23 (p=0.001)	-0.24 (p<0.001)	-0.21 (p=0.001)
AMHCC ⁶ psychiatric visits [†]	0.11 (p=0.099)	0.02 (p=0.778)	0.13 (p=0.065)	-0.04 (p=0.579)	0.07 (p=0.277)
AMHCC nursing visits [†]	0.00 (p=0.950)	-0.06 (p=0.395)	-0.08 (p=0.273)	-0.07 (p=0.341)	-0.08 (p=0.266)

n = sample size

1. DAS-s: The World Health Organization Short Disability Assessment Schedule; 2. GAF: Global Assessment of Functioning; 3. PANSS: Positive and Negative Syndrome Scale; 4. FSSQ: Functional Social Support Questionnaire; 5. WHOQOL-BREF: World Health Organization Quality of Life Scale Brief Version; 6. AMHCC: Adult Mental Health Care Centre

[†]: Time frame= patient visits during the year prior to the first assessment versus patients visits during the year after the first assessment

