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Psychometric evaluation of the Work and Social Adjustment Scale–Youth and Parent versions in adolescents with major depressive disorder

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Abstract

Background

Functional impairment is a central feature of adolescent depression but is not fully captured by measures of symptom severity. The Work and Social Adjustment Scale, Youth Version (WSAS-Y), and Parent Version (WSAS-P) are brief measures of impairment across school, everyday activities, social activities, leisure, and family relationships. This study evaluated their psychometric properties in adolescents with major depressive disorder.

Methods

Participants were 219 adolescents aged 13–17 years with mild-to-moderate major depressive disorder and their caregivers participating in a clinical trial. WSAS-Y and WSAS-P ratings were collected at pre-treatment, post-treatment, and follow-up. Internal consistency was evaluated using Cronbach's alpha and McDonald's omega. One-factor structures were tested with confirmatory factor analysis. Construct validity was examined through associations with youth-, caregiver-, and clinician-rated measures. Youth-caregiver agreement and sensitivity to change were also assessed.

Results

Internal consistency of the WSAS-Y was modest at pre-treatment (α = .65; ω = .65), acceptable at post-treatment (α = .77; ω = .77), and good at follow-up (α = .86; ω = .87). WSAS-P reliability ranged from acceptable to good (α and ω = .74–.82). The one-factor model showed acceptable-to-good fit for the WSAS-Y but inadequate global fit for the WSAS-P, despite moderate loadings for all parent-rated items. Higher WSAS scores were associated with greater depressive symptom severity and poorer quality of life. Associations with anxiety were weaker. Youth-caregiver agreement was low to moderate (r = .30–.39). Both versions showed significant change over time, with improvement occurring primarily between post-treatment and follow-up. Pre-treatment to follow-up effect sizes were small to medium (d = .37 for WSAS-Y; d = .33 for WSAS-P). In addition, WSAS scores were associated with practical indicators of support needs and school functioning, providing further evidence of ecological validity.

Conclusions

The WSAS-Y and WSAS-P provide brief, complementary assessments of functional impairment in adolescents with depression, with generally supported reliability, construct validity and sensitivity to change. Rather than strict unidimensionality, their clinical value may lie in capturing impairment across multiple life domains.

Introduction

Depression is a leading cause of disability during adolescence and is associated with considerable impairment across developmentally important areas of life (Thapar et al., 2022). Depressive symptoms can interfere with school attendance and academic performance, everyday responsibilities, peer and family relationships, and participation in social and leisure activities (Fletcher, 2010; Jaycox et al., 2009). Features such as loss of interest, reduced motivation, fatigue, concentration difficulties, and social withdrawal may have direct consequences for functioning and quality of life. These consequences may persist beyond the acute depressive episode and contribute to poorer psychosocial outcomes later in life.

Although depressive symptom severity and functional impairment are closely related, they represent distinct aspects of clinical status (Yang et al., 2022). Adolescents with similar symptom levels may differ substantially in their ability to manage school, relationships, and daily activities. Conversely, reductions in depressive symptoms do not necessarily result in immediate functional recovery (Kennedy & Paykel, 2004; Paykel et al., 1995). Assessing functioning alongside symptoms may therefore provide a more complete account of illness burden, treatment response, and remaining support needs. However, functional outcomes are still assessed less consistently than symptoms in youth mental health research, highlighting the need for brief, reliable, and developmentally appropriate measures suitable for repeated use (Hoagwood et al., 1996).

The Work and Social Adjustment Scale, Youth Version (WSAS-Y), and its parallel Parent Version (WSAS-P) were developed from the adult version (Mundt et al., 2002) as brief, transdiagnostic measures of functional impairment in young people (Jassi et al., 2020). Each version contains five items assessing impairment in school and work, everyday activities, social activities, leisure activities, and family and close relationships. The availability of parallel youth and caregiver versions is particularly relevant in child and adolescent mental health, where agreement between informants is often incomplete (De Los Reyes & Kazdin, 2005). Youths and caregivers may observe functioning in different contexts or apply different thresholds when judging impairment, making their reports complementary rather than interchangeable.

The initial psychometric evaluation of the WSAS-Y and WSAS-P included 525 children and adolescents with obsessive-compulsive disorder and related conditions (Jassi et al., 2020). Both versions demonstrated high internal consistency, an apparent single-factor structure, adequate test-retest reliability, construct validity, youth-caregiver agreement, and sensitivity to treatment-related change. However, it remains unclear whether these psychometric properties generalise to adolescents with depression, whose functional impairment may be influenced by depression-specific symptoms such as low motivation, anhedonia, fatigue, social withdrawal, and concentration difficulties, potentially affecting youth-caregiver agreement because these symptoms are often less directly observable to caregivers.

The present study evaluated the psychometric properties of the WSAS-Y and WSAS-P in 219 adolescents with mild-to-moderate major depressive disorder (MDD) participating in a clinical trial (Andersson et al.,

2026). Using youth-, caregiver-, and clinician-rated data, we examined internal consistency, factor structure, construct validity, youth-caregiver agreement, associations with clinical characteristics, and sensitivity to change from pre-treatment to post-treatment and follow-up.

We hypothesised that both versions would demonstrate adequate internal consistency and a one-factor structure, meaningful associations with measures of depressive symptoms, global functioning, and quality of life, weaker associations with anxiety symptoms, significant but incomplete youth-caregiver agreement, and sensitivity to clinical improvement after evidence-based treatment.

Methods

Study design and participants

This study was a secondary psychometric analysis of data from a single-blinded, parallel-group randomised controlled trial comparing therapist-guided and self-guided internet-delivered behavioural activation with treatment as usual (Andersson et al., 2026). Because the present study examined measurement properties rather than treatment efficacy, analyses were conducted in the total sample irrespective of treatment allocation. Assessments occurred at pre-treatment, post-treatment (week 11), and follow-up (week 23).

The sample comprised 219 adolescents aged 13 to 17 years who met DSM-5 (American Psychiatric Association, 2013) criteria for mild-to-moderate MDD. Participants were recruited throughout Sweden through self-referral or referral from primary care or Child and Adolescent Mental Health Services. Diagnoses were established by trained psychologists using clinical assessments that included the Mini International Neuropsychiatric Interview for Children and Adolescents (Sheehan et al., 2010) and the Children's Depression Rating Scale-Revised (CDRS-R) (Mayes et al., 2010). Self- and caregiver-reported measures were completed online, and clinician-rated measures were administered by trained assessors.

The trial was prospectively registered at ClinicalTrials.gov (NCT04977856) and approved by the Swedish Ethical Review Authority (2021–02555, with subsequent amendments). Written informed consent was obtained before enrolment.

Measures

The Work and Social Adjustment Scale, Youth Version (WSAS-Y), and parallel Parent Version (WSAS-P) each contain five items assessing impairment in school and work, everyday activities, social activities, leisure activities, and family and close relationships. Items are scored from 0 to 8 and summed to produce a total score from 0 to 40, with higher scores indicating greater functional impairment. Both versions were administered at all three measurement points.

Construct validity was examined using pre-treatment measures of clinician-rated depressive severity (CDRS-R and Clinical Global Impressions-Severity, CGI-S (Guy, 1976)), clinician-rated global functioning (Children's Global Assessment Scale, CGAS (Shaffer et al., 1983), adolescent- and caregiver-reported depressive symptoms (Quick Inventory of Depressive Symptomatology, adolescent QIDS-A17 (Bernstein et al., 2010)), anxiety symptoms (Revised Child Anxiety and Depression Scale Short version, anxiety subscales, RCADS-S (Chorpita et al., 2005)), and health-related quality of life (KIDSCREEN-10 (Ravens-Sieberer et al., 2010)). Higher CGAS and KIDSCREEN-10 scores indicate better functioning or quality of life, whereas higher scores on the symptom measures indicate greater severity.

As additional indicators of everyday functioning, caregivers reported the number of hours of additional parental support provided to the adolescent due to their current difficulties, the number of school absence days, and the number of hours of support from a specialised teacher. These variables were included as ecological indicators of functional impairment because they reflect support needs and participation in everyday educational activities. Higher values indicate greater levels of support received or, in the case of school absence, greater disruption of school participation.

Statistical analyses

Analyses were conducted separately for the WSAS-Y and WSAS-P in R using two-sided tests with $\alpha = .05$. Descriptive statistics were calculated at each measurement point, and internal consistency was evaluated using Cronbach's alpha and McDonald's total omega. Corrected item-total correlations and alpha following item removal were additionally examined for the pre-treatment WSAS-Y.

The hypothesised one-factor structure was evaluated separately for the pre-treatment WSAS-Y and WSAS-P using confirmatory factor analysis. Items were treated as ordered categorical variables, and models were estimated using robust weighted least squares with mean- and variance-adjusted test statistics (WLSMV).

Model fit was evaluated using the scaled chi-square test, robust CFI and TLI, robust RMSEA with 90% confidence intervals, and SRMR. Following commonly used recommendations, CFI and TLI values of approximately .90 or higher and RMSEA and SRMR values of approximately .08 or lower were considered indicative of acceptable model fit. However, fit indices were interpreted jointly rather than according to strict cut-off values, as their performance may vary across model characteristics, estimators, and sample sizes.

Fit indices, factor loadings, residual correlations, and modification indices were considered jointly. No post hoc residual correlations were added. As a sensitivity analysis, the CFA models were re-estimated using robust maximum likelihood (MLR), treating the WSAS items as approximately continuous variables.

Construct validity was assessed using correlations with measures of depressive symptoms, global functioning, and quality of life. To examine discriminant validity, we also evaluated associations with

anxiety symptoms measured by the RCADS. We expected WSAS scores to correlate more strongly with depressive symptoms and functioning than with anxiety symptoms.

To further examine the ecological validity of the WSAS-Y and WSAS-P, Pearson correlations were calculated between WSAS total scores and indicators of functional support and school participation, including parental support hours, school absence days, and hours of support from a specialised teacher.

Incremental validity was examined using linear regression analyses. Clinician-rated depression severity (CDRS-R) was entered in a first step, followed by WSAS-Y or WSAS-P scores in a second step. Separate models were estimated for clinician-rated global functioning (CGAS) and global illness severity (CGI-S). Significant improvements in model fit following inclusion of WSAS scores were interpreted as evidence that the scale provided information beyond depressive symptom severity.

Associations with clinical characteristics were examined using linear regression models in which pre-treatment WSAS scores were regressed separately on CDRS-R, CGI-S, and CGAS scores. Differences according to the number of comorbid diagnoses were assessed using analysis of variance, eta squared, and Tukey-adjusted pairwise comparisons.

Sensitivity to change was evaluated in the full sample irrespective of treatment allocation in the clinical trial (Andersson et al., 2026). The aim was to determine whether the WSAS-Y and WSAS-P could detect change over time rather than to evaluate treatment efficacy. Analysing the full sample maximised statistical precision and variation in change scores, while avoiding multiple subgroup analyses that were not part of the psychometric objectives of the study. Sensitivity to change was examined using separate linear mixed-effects models for the WSAS-Y and WSAS-P. Time was included as a categorical fixed effect, with participant-specific random intercepts accounting for repeated observations. Models were estimated using restricted maximum likelihood and all available data. Estimated marginal means and Holm-adjusted pairwise comparisons used the Kenward-Roger method. Paired within-person effect sizes were calculated as Cohen’s d.

Results

Study sample

The sample comprised 219 adolescents aged 13 to 17 years (M = 15.3, SD = 1.4). Most participants were girls (73.5%), and 84.9% had at least one comorbid psychiatric diagnosis. Baseline demographic and clinical characteristics are presented in Table 1.

Table 1
Sample characteristics

Characteristic	Total sample
Sample size, N	219
Age, mean (SD), range	15.3 (1.4), 13.0–17.9
Gender, n (%)	
Girl	161 (73.5%)
Boy	45 (20.5%)
Other	13 (5.9%)
Number of comorbid diagnoses, n (%)	
None	33 (15.1%)
One	51 (23.3%)
Two or more	135 (61.6%)
Clinician- and self-reported measures	
CDRS-R, mean (SD)	57.05 (9.51)
CGI-S, mean (SD)	3.84 (0.67)
CGAS, mean (SD)	59.50 (4.41)
QIDS-A17, mean (SD)	14.75 (4.14)
RCADS anxiety, youth-report, mean (SD)	15.75 (6.69)
KIDSCREEN-10, youth-report, mean (SD)	28.68 (3.67)
WSAS-Y, mean (SD)	18.34 (6.41)
QIDS-A17, parent-report, mean (SD)	12.77 (3.87)
RCADS anxiety, parent-report, mean (SD)	11.59 (5.06)
KIDSCREEN-10, parent-report, mean (SD)	29.47 (3.35)
WSAS-P, mean (SD)	17.92 (7.41)

Note. Values are presented as mean (SD), range, or n (%), unless otherwise indicated. CDRS-R = Children's Depression Rating Scale-Revised; CGI-S = Clinical Global Impressions-Severity; CGAS = Children's Global Assessment Scale; QIDS-A = Quick Inventory of Depressive Symptomatology-Adolescent; RCADS = Revised Child Anxiety and Depression Scale; WSAS-Y = Work and Social Adjustment Scale, Youth Version; WSAS-P = Work and Social Adjustment Scale, Parent Version. Higher WSAS scores indicate greater functional impairment. Higher CGAS and KIDSCREEN-10 scores indicate better functioning or quality of life.

WSAS-Y data were available for all 219 participants at pre-treatment, 190 (86.8%) at post-treatment, and 185 (84.5%) at follow-up. Corresponding WSAS-P data were available for 219, 209 (95.4%), and 195 (89.0%) participants, respectively.

Descriptive statistics and internal consistency

Descriptive statistics and internal consistency coefficients for the WSAS total scores are presented in Table 2. Item-level descriptive statistics across all measurement points are provided in Supplementary **Table S1**. At pre-treatment, mean total scores were 18.34 (SD = 6.41) for the WSAS-Y and 17.92 (SD = 7.41) for the WSAS-P.

Internal consistency of the WSAS-Y was modest at pre-treatment (Cronbach's α = .65; McDonald's ω = .65), acceptable at post-treatment (α = .77; ω = .77), and good at follow-up (α = .86; ω = .87). Corrected item-total correlations for the pre-treatment WSAS-Y ranged from .31 to .46, and removal of any individual item did not improve internal consistency (**Table S2**).

Internal consistency of the WSAS-P was acceptable at pre-treatment (α = .74; ω = .74) and good at post-treatment (α = .81; ω = .81) and follow-up (α = .82; ω = .82).

Table 2
WSAS descriptive statistics and internal consistency over time points

Informant	Time point	n	M (SD)	Observed range	α	ω
WSAS-Y	Pre-treatment	219	18.34 (6.41)	0–36	.65	.65
WSAS-Y	Post-treatment	190	17.44 (7.40)	0–33	.77	.77
WSAS-Y	Follow-up	185	14.89 (9.02)	0–36	.86	.87
WSAS-P	Pre-treatment	219	17.92 (7.41)	2–38	.74	.74
WSAS-P	Post-treatment	209	17.86 (8.19)	0–40	.81	.81
WSAS-P	Follow-up	195	15.42 (8.53)	0–35	.82	.82

Note. WSAS-Y = Work and Social Adjustment Scale, Youth Version; WSAS-P = Work and Social Adjustment Scale, Parent Version. Reliability coefficients are reported for the five-item total scale. Total scores range from 0 to 40. Higher scores indicate greater functional impairment.

Factor analysis

The hypothesised one-factor model showed acceptable-to-good fit for the WSAS-Y, scaled $\chi^2(5) = 12.95$, $p = .024$, robust CFI = .951, robust TLI = .903, robust RMSEA = .080, 90% CI [.026, .135], and SRMR = .042. Standardised factor loadings ranged from .35 for school and work to .68 for social activities, and all loadings were statistically significant.

The corresponding one-factor model showed less satisfactory global fit for the WSAS-P, scaled $\chi^2(5) = 28.39$, $p < .001$, robust CFI = .886, robust TLI = .772, robust RMSEA = .161, 90% CI [.108, .220], and SRMR = .062. Nevertheless, all five WSAS-P items had moderate and statistically significant factor loadings, ranging from .56 for school and work to .69 for social activities. Standardised residual correlations were small, with a maximum absolute value of .145. Modification indices indicated several areas of local misfit rather than a single theoretically interpretable residual association. Therefore, no post hoc residual correlations were added. Overall, the results provided clearer support for the proposed one-factor structure of the WSAS-Y than of the WSAS-P.

Table 3
Confirmatory factor analysis of the WSAS-Y and WSAS-P at baseline

Informant	χ^2(df)	p	Robust CFI	Robust TLI	Robust RMSEA (90% CI)	SRMR
WSAS-Y	12.95 (5)	.024	.951	.903	.080 (.026–.135)	.042
WSAS-P	28.39 (5)	< .001	.886	.772	.161 (.108–.220)	.062

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; SRMR = standardised root mean square residual. Models were estimated using robust weighted least squares with mean- and variance-adjusted test statistics (WLSMV). Robust fit indices are reported.

Sensitivity analyses using MLR produced similar conclusions. Fit indices for the WSAS-Y improved slightly (robust CFI = .963, TLI = .926, RMSEA = .064), whereas the WSAS-P continued to show inadequate fit (robust CFI = .881, TLI = .762, RMSEA = .154).

Construct validity

Higher WSAS-Y scores were associated with lower youth-reported quality of life on the KIDSCREEN-10, $r = -.47$, 95% CI [−.57, −.36], $p < .001$, and greater self-reported depressive symptoms on the QIDS-A, $r = .47$, 95% CI [.36, .56], $p < .001$.

Associations were smaller for clinician-rated depressive severity on the CDRS-R, r = .32, 95% CI [.20, .44], p < .001, and CGI-S, r = .28, 95% CI [.15, .40], p < .001. WSAS-Y scores also showed a small association with youth-reported anxiety symptoms, r = .24, 95% CI [.11, .36], p < .001. The association with clinician-rated global functioning on the CGAS was r = − .16, 95% CI [− .28, − .02], p = .021.

Higher WSAS-P scores were moderately associated with greater parent-reported depressive symptoms, r = .52, 95% CI [.42, .61], p < .001, and lower parent-reported quality of life, r = − .42, 95% CI [− .53, − .31], p < .001. The association with parent-reported anxiety symptoms was smaller, r = .24, 95% CI [.11, .36], p < .001.

Table 4
Baseline construct validity of the WSAS-Y and WSAS-P (N = 219)

Scale version	Validity measure	r	95% CI	p
WSAS-Y	CGAS	−.16	[− .28, − .02]	.021
WSAS-Y	KIDSCREEN-10 youth	−.47	[− .57, − .36]	< .001
WSAS-Y	CDRS-R	.32	[.20, .44]	< .001
WSAS-Y	CGI-S	.28	[.15, .40]	< .001
WSAS-Y	QIDS-A	.47	[.36, .56]	< .001
WSAS-Y	RCADS anxiety youth	.24	[.11, .36]	< .001
WSAS-P	KIDSCREEN-10 parent	−.42	[− .53, − .31]	< .001
WSAS-P	QIDS parent	.52	[.42, .61]	< .001
WSAS-P	RCADS anxiety parent	.24	[.11, .36]	< .001

Note. Pearson correlations are reported. Higher WSAS scores indicate greater functional impairment. Higher CGAS and KIDSCREEN-10 scores indicate better functioning or quality of life; negative correlations were therefore expected.

Ecological validity

Ecological validity analyses examined associations with practical indicators of functional difficulties. Higher WSAS-Y and WSAS-P scores were associated with a greater need for parental support (WSAS-Y: r = .24, 95% CI [.11, .36], p < .001; WSAS-P: r = .37, 95% CI [.25, .48], p < .001). WSAS-P scores were also associated with a greater number of school absence days (r = .23, 95% CI [.10, .35], p < .001), whereas the corresponding association for the WSAS-Y was not significant (r = .09, p = .181). Neither version was associated with hours of support from a specialised teacher.

Incremental validity

To examine incremental validity, hierarchical regression analyses were conducted in which clinician-rated depression severity (CDRS-R) was entered before WSAS scores. The WSAS-P explained additional variance in clinician-rated global functioning (CGAS) beyond depressive symptom severity, $\Delta F(1, 216) = 13.97$, p < .001. In contrast, the WSAS-Y did not explain additional CGAS variance after controlling for CDRS-R, $\Delta F(1, 216) = 1.15$, p = .285. For clinician-rated global severity (CGI-S), the WSAS-P contributed a small but significant increment beyond CDRS-R, $\Delta F(1, 216) = 5.29$, p = .022, whereas the WSAS-Y did not, $\Delta F(1, 216) = 2.20$, p = .140.

Youth-caregiver agreement

Agreement between youth- and caregiver-reported functional impairment was low to moderate. WSAS-Y and WSAS-P scores were correlated at pre-treatment, r = .39, 95% CI [.27, .50], p < .001; post-treatment, r

= .30, 95% CI [.17, .43], p < .001; and follow-up, r = .33, 95% CI [.19, .45], p < .001.

Associations with clinical characteristics

Greater clinician-rated depression severity was associated with higher functional impairment. Each one-point increase in CDRS-R score was associated with a 0.22-point higher WSAS-Y score, B = 0.22, 95% CI [0.13, 0.30], p < .001, and a 0.17-point higher WSAS-P score, B = 0.17, 95% CI [0.06, 0.27], p = .002.

Each one-point increase in CGI-S score was associated with a 2.66-point higher WSAS-Y score, B = 2.66, 95% CI [1.42, 3.90], p < .001, and a 2.78-point higher WSAS-P score, B = 2.78, 95% CI [1.34, 4.23], p < .001.

Higher clinician-rated global functioning was associated with lower functional impairment. Each one-point increase in CGAS score was associated with a 0.23-point lower WSAS-Y score, B = − 0.23, 95% CI [− 0.42, − 0.03], p = .021, and a 0.49-point lower WSAS-P score, B = − 0.49, 95% CI [− 0.70, − 0.27], p < .001.

WSAS scores did not differ significantly according to the number of comorbid diagnoses, WSAS-Y: F(4, 214) = 0.81, p = .519, η^2 = .01; WSAS-P: F(4, 214) = 1.51, p = .200, η^2 = .03. None of the Tukey-adjusted pairwise comparisons were statistically significant.

Sensitivity to change

Linear mixed-effects models indicated significant changes in functional impairment over time for both informants. The overall effect of time was significant for the WSAS-Y, F(2, 386.68) = 19.54, p < .001, and the WSAS-P, F(2, 407.70) = 15.37, p < .001.

WSAS-Y scores did not differ significantly between pre-treatment and post-treatment, estimated mean difference = 0.76, 95% CI [0.55, 2.06], p = .165. However, scores were significantly lower at follow-up than at pre-treatment, estimated mean difference = 3.32, 95% CI [2.00, 4.64], p < .001, and post-treatment, estimated mean difference = 2.56, 95% CI [1.20, 3.92], p < .001.

Similarly, WSAS-P scores did not differ significantly between pre-treatment and post-treatment, estimated mean difference = 0.16, 95% CI [âˆ'0.97, 1.30], p = .730. Scores were significantly lower at follow-up than at pre-treatment, estimated mean difference = 2.43, 95% CI [1.27, 3.60], p < .001, and post-treatment, estimated mean difference = 2.27, 95% CI [1.09, 3.44], p < .001.

The corresponding paired within-person effect sizes from pre-treatment to follow-up were small to medium, d = .37 for the WSAS-Y and d = .33 for the WSAS-P.

Discussion

This study evaluated the psychometric properties of the WSAS-Y and WSAS-P in 219 adolescents with mild-to-moderate MDD. Strengths of the study include the diagnostically well-characterised sample, parallel youth and caregiver reports, three measurement points, and the inclusion of additional self-,

caregiver-, and clinician-rated measures. The use of confirmatory factor analysis also extended the exploratory evaluation conducted in the original validation study (Jassi et al., 2020), by providing a more stringent test of the hypothesised unidimensional factor structure. Overall, both versions showed meaningful associations with relevant clinical measures and detected longitudinal change. Interestingly, reliability and structural validity differed across informants and measurement points.

Internal consistency of the WSAS-Y was modest at pre-treatment but increased to acceptable levels at post-treatment and good levels at follow-up. The WSAS-P showed acceptable-to-good reliability throughout. The lower baseline reliability of the WSAS-Y may partly reflect the scale's brevity and the relatively restricted score variability in this selected sample. Importantly, corrected item-total correlations were positive, and removing any item reduced rather than improved Cronbach's alpha. The finding therefore does not appear to be driven by a poorly functioning item, supporting retention of all five items. Nevertheless, pre-treatment WSAS-Y scores may have somewhat lower precision, particularly for individual-level interpretation.

The confirmatory factor analyses provided stronger support for the proposed one-factor structure of the WSAS-Y than of the WSAS-P. The WSAS-Y showed acceptable fit, although the school and work item had a relatively weak loading. This item remains clinically and developmentally important, and its removal did not improve internal consistency. In contrast, all WSAS-P items showed moderate loadings on the general factor, but overall model fit was less satisfactory. This finding contrasts with the original psychometric evaluation by Jassi et al. (2020) and suggests that the assumption of strict unidimensionality may warrant further investigation in caregiver ratings. One possible explanation is that caregivers may not perceive impairment across functional domains as manifestations of a single underlying construct to the same extent as adolescents themselves. For example, caregivers may observe difficulties in school and everyday activities differently from difficulties in social, leisure, or family functioning. Alternatively, the weaker fit may reflect characteristics of the present depression sample, in which impairment may be unevenly distributed across domains. Further research is needed to determine whether this pattern replicates in other samples of adolescents with depression.

An additional consideration concerns the conceptualisation of functional impairment. The present analyses evaluated the WSAS within a conventional reflective measurement framework, consistent with previous psychometric studies. However, functional impairment may also be viewed as a composite of difficulties across several life domains, including school, social relationships, leisure activities, and everyday functioning. From this perspective, perfect fit to a strict one-factor model may be less important than the extent to which the measure provides clinically meaningful information. Supporting this interpretation, WSAS-P scores explained additional variance in clinician-rated global functioning beyond depressive symptom severity. This suggests that the scale captures aspects of adolescents' everyday functioning that are not fully reflected in symptom measures alone. From a clinical perspective, adolescents with similar levels of depressive symptoms may nevertheless differ substantially in their ability to manage school demands, relationships, and everyday responsibilities.

Construct validity was supported by meaningful associations with depressive symptoms, quality of life, illness severity, and global functioning. WSAS-Y/P scores were most strongly associated with informant-matched ratings of depressive symptoms and quality of life, whereas associations with anxiety were weaker. However, the WSAS-Y showed only a small association with clinician-rated global functioning. This may reflect differences between a domain-specific adolescent report and a single global clinician rating, as well as the restricted range of clinical functioning in the sample. The findings indicate that functional impairment overlaps with depressive symptom severity but is not reducible to it.

The associations with parental support provide additional evidence for the ecological validity of the WSAS-Y and WSAS-P. Adolescents with higher levels of functional impairment required more parental assistance in everyday life. In contrast, neither version was associated with the amount of specialised educational support. This variable may be influenced by school-based administrative factors and longer-term educational needs rather than current functional impairment. School absence showed a modest association with caregiver-reported impairment only, suggesting that parents may place greater emphasis on observable indicators of school functioning when evaluating impairment.

Greater clinician-rated depression severity was associated with higher functional impairment, and better clinician-rated global functioning was associated with lower WSAS scores. By contrast, impairment did not differ by the number of comorbid diagnoses. A diagnostic count may be a relatively crude indicator, as the functional consequences of comorbidity depend on the type and severity of the additional conditions.

Youth-caregiver agreement was modest and lower than in the original validation study in youth with OCD and related disorders (Jassi et al., 2020). This interpretation is consistent with broader findings that agreement tends to be lower for internalising difficulties than for more overt problems (De Los Reyes & Kazdin, 2005). The WSAS-Y and WSAS-P should therefore be regarded as complementary rather than interchangeable measures. Discrepant ratings may themselves provide clinically useful information about how impairment is experienced and observed.

Both WSAS versions were sensitive to change over time. Scores changed little between pre-treatment and post-treatment but decreased significantly between post-treatment and follow-up. The observed pattern may suggest that functional recovery develops more gradually than symptom change, as returning to school, rebuilding relationships, and resuming everyday activities can require additional time (Kennedy & Paykel, 2004).

Limitations

Important limitations include the predominance of girls, restriction to a Swedish-speaking clinical environment, a population of adolescents with mild-to-moderate depression, and uncertain generalisability to more severe or diverse clinical populations. Test-retest reliability could not be examined.

Conclusion

In conclusion, the WSAS-Y and WSAS-P provide brief and clinically informative assessments of functional impairment in adolescents with depression. Reliability was generally adequate, construct validity was supported, and both versions detected change over time, making them suitable as outcome measures. Their clinical value may lie in capturing impairment across multiple life domains, rather than strict unidimensionality. Whenever possible, both versions should be used in tandem, as they provide complementary perspectives on adolescent functioning.

Declarations

Competing Interests

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Author Contribution

F.L. conceived the study, performed the statistical analyses, and wrote the initial draft of the manuscript. R.A. was responsible for data collection. All authors contributed to the interpretation of the findings and review and revision of the manuscript. All authors read and approved the final manuscript.

Data Availability

The data generated and analyzed in this study are not publicly available due to legal and ethical restrictions on the sharing of sensitive personal data and to protect participant confidentiality.

References

1. American Psychiatric Association (2013) Diagnostic and statistical manual of mental disorders, DSM 5, 5th edn. American Psychiatric Publishing
2. Chorpita BF, Moffitt CE, Gray J (2005) Psychometric properties of the Revised Child Anxiety and Depression Scale in a clinical sample. Behav Res Ther 43(3):309–322. https://doi.org/10.1016/j.brat.2004.02.004
3. Fletcher JM (2010) Adolescent depression and educational attainment: Results using sibling fixed effects. Health Econ 19(7):855–871. https://doi.org/10.1002/hec.1526
4. Hoagwood K, Jensen PS, Petti T, Burns BJ (1996) Outcomes of mental health care for children and adolescents: I. A comprehensive conceptual model. J Am Acad Child Adolesc Psychiatry 35(8):1055–1063. https://doi.org/10.1097/00004583-199608000-00017
5. Jassi A, Lenhard F, Krebs G, Gumpert M, Jolstedt M, Andrén P, Nord M, Aspvall K, Wahlund T, Volz C, Mataix-Cols D (2020) The Work and Social Adjustment Scale, Youth and Parent Versions: Psychometric Evaluation of a Brief Measure of Functional Impairment in Young People. Child Psychiatry Hum Dev 51(3):453–460. https://doi.org/10.1007/s10578-020-00956-z
6. Jaycox LH, Stein BD, Paddock S, Miles JNV, Chandra A, Meredith LS, Tanielian T, Hickey S, Burnam MA (2009) Impact of Teen Depression on Academic, Social, and Physical Functioning. Pediatrics 124(4):e596–e605. https://doi.org/10.1542/peds.2008-3348
7. Kennedy N, Paykel ES (2004) Residual symptoms at remission from depression: Impact on long-term outcome. J Affect Disord 80(2–3):135–144. https://doi.org/10.1016/S0165-0327(03)00054-5
8. Lenhard F, Andersson E, Mataix-Cols D, Rück C, Aspvall K, Serlachius E (2020) Long-term outcomes of therapist-guided Internet-delivered cognitive behavior therapy for pediatric obsessive-compulsive disorder. Npj Digit Med 3(1):1–5. https://doi.org/10.1038/s41746-020-00327-x
9. Lenhard F, Andersson E, Mataix-Cols D, Rück C, Vigerland S, Högström J, Hillborg M, Brander G, Ljungström M, Ljótsson B, Serlachius E (2017) Therapist-Guided, Internet-Delivered Cognitive-Behavioral Therapy for Adolescents With Obsessive-Compulsive Disorder: A Randomized Controlled Trial. J Am Acad Child Adolesc Psychiatry 56(1):10–19e2. https://doi.org/10.1016/j.jaac.2016.09.515
10. Mayes TL, Bernstein IH, Haley CL, Kennard BD, Emslie GJ (2010) Psychometric Properties of the Children's Depression Rating Scale–Revised in Adolescents. J Child Adolesc Psychopharmacol 20(6):513–516. https://doi.org/10.1089/cap.2010.0063
11. Mundt JC, Marks IM, Shear MK, Greist JH (2002) The Work and Social Adjustment Scale: A simple measure of impairment in functioning. Br J Psychiatry 180:461–464
12. Paykel ES, Ramana R, Cooper Z, Hayhurst H, Kerr J, Barocka A (1995) Residual symptoms after partial remission: An important outcome in depression. Psychol Med 25(6):1171–1180. https://doi.org/10.1017/S0033291700033146
13. Ravens-Sieberer U, Erhart M, Rajmil L, Herdman M, Auquier P, Bruil J, Power M, Duer W, Abel T, Czemy L, Mazur J, Czimbalmos A, Tountas Y, Hagquist C, Kilroe J, Group (2010) Reliability, construct and criterion validity of the KIDSCREEN-10 score: A short measure for children and adolescents'

well-being and health-related quality of life. Qual Life Res 19(10):1487–1500 the E. K. E. K. https://doi.org/10.1007/s11136-010-9706-5

14. Rush AJ, Trivedi MH, Ibrahim HM, Carmody TJ, Arnow B, Klein DN, Markowitz JC, Ninan PT, Kornstein S, Manber R, Thase ME, Kocsis JH, Keller MB (2003) The 16-Item Quick Inventory of Depressive Symptomatology (QIDS), clinician rating (QIDS-C), and self-report (QIDS-SR): A psychometric evaluation in patients with chronic major depression. Biol Psychiatry 54(5):573–583. https://doi.org/10.1016/s0006-3223(02)01866-8
15. Shaffer D, Gould MS, Brasic J, Ambrosini P, Fisher P, Bird H, Aluwahlia S (1983) A children's global assessment scale (CGAS). Arch Gen Psychiatry 40(11):1228–1231
16. Sheehan DV, Sheehan KH, Shytle RD, Janavs J, Bannon Y, Rogers JE, Milo KM, Stock SL, Wilkinson B (2010) Reliability and validity of the Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID). J Clin Psychiatry 71(3):313–326. https://doi.org/10.4088/JCP.09m05305whi
17. Thapar A, Eyre O, Patel V, Brent D (2022) Depression in young people. Lancet 400(10352):617–631. https://doi.org/10.1016/S0140-6736(22)01012-1
18. Vigerland S, Serlachius E, Thulin U, Andersson G, Larsson J-O, Ljótsson B (2017) Long-term outcomes and predictors of internet-delivered cognitive behavioral therapy for childhood anxiety disorders. Behav Res Ther 90:67–75. https://doi.org/10.1016/J.BRAT.2016.12.008
19. Yang H, Gao S, Li J, Yu H, Xu J, Lin C, Yang H, Teng C, Ma H, Zhang N (2022) Remission of symptoms is not equal to functional recovery: Psychosocial functioning impairment in major depression. Front Psychiatry 13:915689. https://doi.org/10.3389/fpsyt.2022.915689

Figures

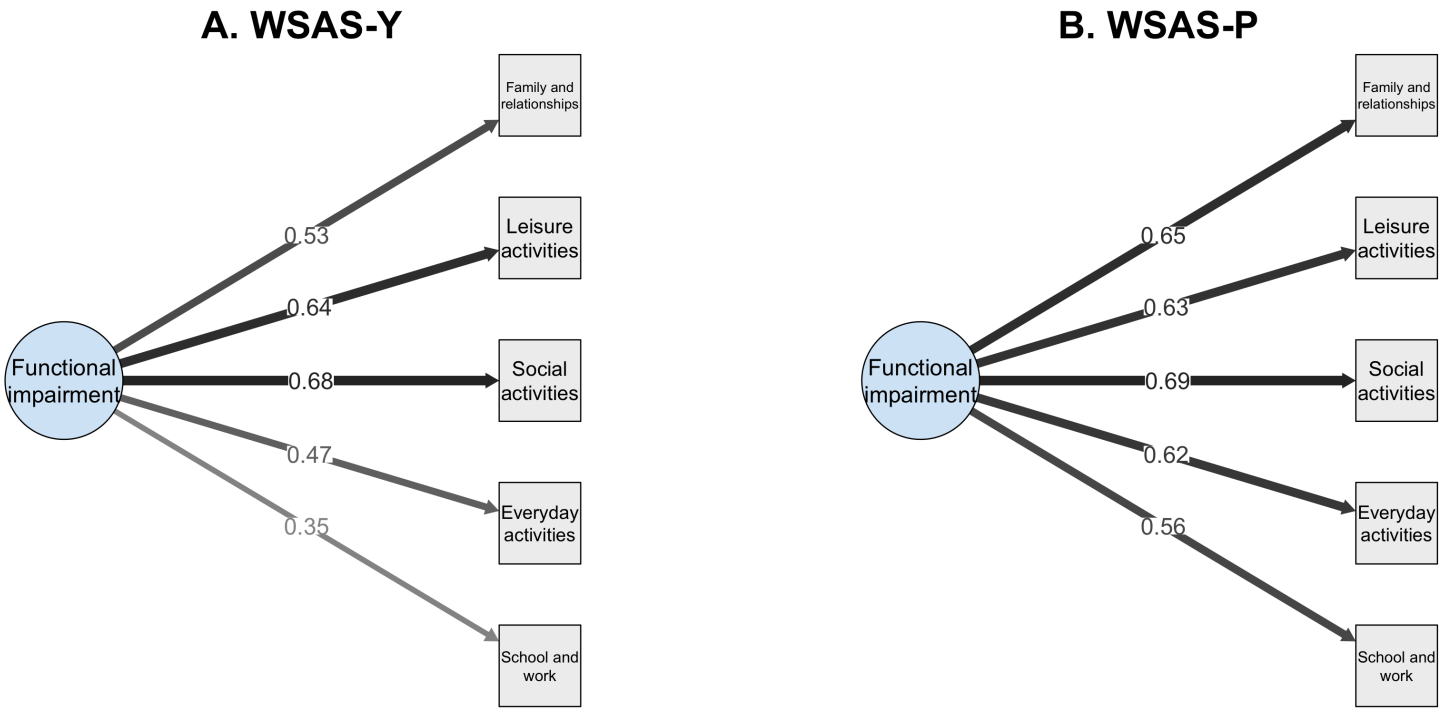


Figure 1

Standardised factor loadings for the one-factor models of (A) the Work and Social Adjustment Scale, Youth Version (WSAS-Y), and (B) the Work and Social Adjustment Scale, Parent Version (WSAS-P), at baseline. All factor loadings were statistically significant.

Sensitivity analyses using MLR produced similar conclusions. Fit indices for the WSAS-Y improved slightly (robust CFI = .963, TLI = .926, RMSEA = .064), whereas the WSAS-P continued to show inadequate fit (robust CFI = .881, TLI = .762, RMSEA = .154).

Supplementary Files

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- PsychometricevaluationoftheWorkandSocialAdjustmentScalesupplement.docx