Reliability and validity of the Work and Social Adjustment Scale in treatment seeking problem gamblers

Barry Tolchard[1,2]

[1]University of New England and [2]University of Essex

Corresponding author

Barry Tolchard

Tel: +61 2 67727512

e-mail: btolchar@une.edu.au

Address: School of Health, University of New England, Armidale, Australia NSW, 2351

Present/permanent address

As above

Abstract

Background: Problem gambling is a growing concern as governments become more reliant on gambling revenue. It has been widely reported that problem gamblers experience both high levels of co-morbid mental health issues and subsequent disability that comes with such. To date there have been few measures tested with problem gamblers that are a good measure of this disability. The Work and Social Adjustment Scale (WSAS) is a 5-item measure of disability which is used widely in a number of clinical settings including gambling.

Method: The reliability and, validity of the WSAS was examined in 171 out-patient problem gamblers who presented to a cognitive-behaviour therapy service in Adelaide, Australia. Subjects were assessed by trained cognitive-behaviour therapists for suitability for treatment and offered individual out-patient, group or in-patient treatment. All subjects completed a battery of outcome measures at assessment, discharge, 1-, 3-, and 6-month follow-up. All subjects signed consent for their clinical data to be used in research.

Results: The internal consistency of the WSAS was excellent in problem gamblers. A principal component analysis generated a single factor of disability. The WSAS has good concurrent validity with measures of gambling and co-morbid anxiety and depression. The WSAS also shows promise as measure of improvement in a clinical service.

Conclusion: The WSAS has excellent reliability and sound validity with a treatment seeking problem gambling population. Understanding disability related to gambling may offer insights into the long term success of gamblers completing treatment. This needs to be further tested in a more rigorous experimental setting.

Keywords: measurement; problem gambling; disability, co-morbidity; outcomes

1. Background

Disability associated with mental and long term physical problems is of growing concern (Cornelius, Van der Klink, Groothoff, & Brouwer, 2011; Kessler et al., 2009). A number of measures have been developed that determine disability in large populations (Andrews, Kemp, Sunderland, Von Korff, & Ustun, 2009; Garin et al., 2010) or, more specifically, the assessment of individuals (Leifker, Patterson, Heaton, & Harvey, 2011). One commonly reported individual measure of disability is the Work and Social Adjustment Scale (WSAS) (Mataix-Cols et al., 2005). The WSAS is a simple 5 item measure of disability and has been used in a number of clinical populations including chronic fatigue (Cella, Sharpe, & Chalder, 2011), phobias (Mundt, Marks, Shear, & Greist, 2002), insomnia (Jansson-Fröjmark, 2013), depression (Ekers, Richards, McMillan, Bland, & Gilbody, 2011), post-traumatic stress disorder (Blix, Hansen, Birkeland, Nissen, & Heir, 2013) and psychogenic non-epileptic seizures (Goldstein et al., 2010). The WSAS has also been adopted in routine clinical practice in a number of areas including Improving Access to Psychological Therapies services in the UK (Glover, Webb, & Evison, 2010; Richards & Suckling, 2009).

To date most measures used with gamblers assess the behavioral aspects of gambling or the consequences of out of control gambling (Pallanti, DeCaria, Grant, Urpe, & Hollander, 2005; Petry, 2003; Raylu & Oei, 2004a, 2004b; Rousseau, Vallerand, Ratelle, Mageau, & Provencher, 2002). Gambling screening tools are based on the criteria set out by the Diagnostic and Statistical manual (American Psychiatric Association, 1994; McCready et al., 2013) and do not take into account disability issues (Battersby, Thomas, Tolchard, & Esterman, 2002; Lesieur & Blume, 1987; Mcmillen & Wenzel, 2006). One tool developed in Australia—the Victorian Gambling Screen (VGS)—was developed using a harm model and incorporates some elements of disability. This tool has been shown to be reliable and valid in a number of settings (Ben-Tovim, Esterman, Tolchard, & Battersby, 2001; Tolchard & Battersby, 2010; Tolchard & Delfabbro, 2013). There is clear evidence of disability associated with problem gambling (el-Guebaly et al., 2013), however little has been reported on the management of this disability. Recently, a modified version of the Sheehan Disability Scales (SDS) was described with problem gamblers (Hodgins, 2013). This study found the SDS to have sound psychometric properties and good predictor of treatment outcome in problem gamblers.

This paper describes the psychometric properties of the WSAS with a large sample of treatment seeking problem gamblers.

2. Method

2.1. Subjects

Participants were 171 treatment seeking problem gamblers referred to a state-wide cognitive-behaviour therapy outpatient service. They were interviewed using a validated assessment (Ben-Tovim et al., 2001) which provided experienced clinicians with a diagnosis based the criteria of the DSM-IV (American Psychiatric Association, 2000). Subjects mean age was 44 (SD = 15) and 105 (61.5%) were females. They majority had been experiencing a gambling problem for longer than 5 years. Ninety-one percent reported their main form of gambling to be electronic gaming machines (slots). All patients signed an informed consent for their clinical data to be reported. Table 1 provides the treatment status of subjects at the time of the analysis.

Table 1. Treatment status of subjects

	N	(%)
Drop Out Assessment (DO-A)	44	(21.46)
Drop Out Treatment (DO-T)	18	(8.78)
Completed (C)	143	(69.76)

Note: DO-A = attended only one session and no advise given; DO-T = began active treatment but left programme before 5 sessions and C = completed active treatment and provide discharge measures

2.2. Measures

Work and Social Adjustment Scale (WSAS)—a five item scale comprising work, home management, social leisure, relationships and private leisure. Each item is measured on a nine point Likert type scale from 0—no disability to 8—severe disability. The scale can be used by patients and clinicians either as a total score (range 0-40), average mean score (range 0-8) or through each individual item. In this study an average 0-8 score was taken across the 5 items. The WSAS has been shown to be reliable ($\alpha = .80 – .91$) in a number of clinical problems. In addition the *South Oaks Gambling Screen (SOGS)*—a 21 item measure of gambling behaviour and consequences—was administered (Lesieur & Blume, 1987), the *Beck Depression Inventory* (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), the

Beck Anxiety Inventory (BAI) (Beck, Epstein, Brown, & Steer, 1988), single item *gambling urge* and, a self-reported clinical outcome measures that specifically examined the subject's main problem were given at all stages of treatment. Each problem statement has associated goals and all were measured on a nine point Likert scale ranging from 0—no problem/goal achieved to 8—severe problem/goal not achieved. This set of outcome scales have been described in a number of studies (Kenwright, Liness, & Marks, 2001; Tolchard, 1995; Warnock-Parkes et al., 2012) including gambling (Oakes, Battersby, Pols, & Cromarty, 2008; Tolchard & Battersby, 2000; Tolchard & Battersby, 2001, 2013) and have been shown to detect change over time.

3. Results and discussion

3.1. Internal consistency and factor structure

Cronbach's α was used to test the internal consistency of the WSAS = .83. A principal components factor analysis was performed (Varimax rotation) on the WSAS which extracted a single disability factor with an eigenvalue of 3.34 accounting for 69% of the variance. Individual items' disability factor loadings ranged from 0.72 to 0.88.

3.2 Correlations of the WSAS total score and other measures

The WSAS had medium correlations with the BAI, BDI and SOGS. There was a small correlation with the goal statement and no correlation with the self-reported problem statement (Table 1). However, there was a correlation between the WSAS and the self-reported urge to gamble (tau-b = .296, $p < .01$). This measure may be a better indicator of the state of the gamblers problem than their self-reported gambling problem statement. Paired sample correlations between the WSAS and the BAI indicate that where there was an improvement in disability there was a matched improvement in anxiety (WSAS assessment and BAI assessment, discharge and 1, 3, 6 Month follow-up; $p < .05$). This is also the case for the BDI.

Table 2. Kendall's tau-b correlations at pre-treatment of WSAS total with BAI, BDI, SOGS, main problem and goal

	BAI	BDI	SOGS	Main Problem	Goal
n	150	168	168	124	111
Tau-b	.351**	.401**	.270**	.069	.209**
p	< .001	< .001	< .001	> .05	< .01

Note: numbers vary due to missing data

3.3. Validity: WSAS total vs. initial total gambling severity score and co-morbid anxiety/depression

There was a clear linear relationship between the SOGS total score and the WSAS total at assessment (R^2 = .57), discharge (R^2 = .52), 1- (R^2 = .35), 3- (R^2 = .52), 6- (R^2 = .38) month follow-up. This suggests as gambling severity improves then there is a subsequent reduction in disability. Similarly the WSAS had a strong linear relationship with both the BAI except in the 3-, and 6-month follow up stages. There is an initial linear relationship between WSAS scores and the BDI; however this was no longer the case after assessment (see Table 3). This would indicate that severity on the BAI/BDI explains WSAS changes at first, but other factors account for continual changes post-treatment.

Table 3.Coefficients between changes in WSAS scores and initial BAI/BDI score

	Beta	t	*p.*
BAI			
WSA-Total Ass	.477	3.92	*.01*
WSA-Total Dis	2.100	7.30	*.00*
WSA-Total 1FU	-2.291	-7.97	*.00*
WSA-Total 3FU	-.336	-1.40	*.20*
WSA-Total 6FU	.343	1.64	*.14*
BDI			
WSA-Total Ass	.617	3.28	*.01*
WSA-Total Dis	.911	2.12	*.06*
WSA-Total 1FU	-1.302	-2.91	*.01*
WSA-Total 3FU	.478	1.43	*.18*
WSA-Total 6FU	-.048	-0.16	*.88*

A univariate general linear model was carried out on the BAI/BDI. Both the BAI ($F(27,77) = 8.60$, $p < .001$) and BDI ($F(28, 77) = 7.89$, $p < .001$) showed a significant main effect with the WSAS. There was also a significant interaction for the BAI/BDI with the WSAS ($F(8, 77) = 4.73$, $p < .05$). Due to some items on the BAI/BDI having fewer than 2 responses no post hoc analysis were possible. However, when the model was run using the BAI/BDI categorical cut-off scores both the significant main effects (BAI ($F(3,72) = 8.72$, $p < .001$) and BDI ($F(3, 72) = 10.97$, $p < .001$)) were retained but the significant BAI/BDI interaction was lost (table 4). A Tukey HSD *post hoc* analysis revealed significant pairwise differences

between sub-clinical anxiety and moderate/severe anxiety ($p < .05$). The *post hoc* analysis identified a more complex picture for depression with significant pairwise differences between sub-clinical depression and moderate/severe depression ($p < .05$) as well as differences between mild depression and severe depression ($p < .05$). In anxiety, experience of disability, has more of an affect between sub-clinical and higher levels of anxiety. In depression both sub-clinical and mild levels of depression are different from the higher levels of depression.

Table 4.Mean and standard deviation for WSAS total score and BAI/BDI assessment severity

	M (SD)
BAI	
Sub-clinical	2.89 (1.84)
Mild	4.38 (1.49)
Moderate	5.15 (1.65)
Severe	5.18 (2.07)
BDI	
Sub-clinical	2.19 (1.83)
Mild	3.31 (1.95)
Moderate	4.17 (1.56)
Severe	5.30 (1.82)

The relationship between gambling severity, disability and co-morbidity with completion of treatment suggests a reduction in gambling severity is associated with a similar reduction in all other measures. Therefore the target behaviour of gambling explains the overall presentation. Working to reduce gambling appears to produce a corresponding reduction in BAI/BDI scores and so disability measured by the WSAS reduces.

3.4 Sensitivity to change

Figure 1 show that the WSAS scores improved as subjects completed treatment and that this change was maintained into six month follow-up.

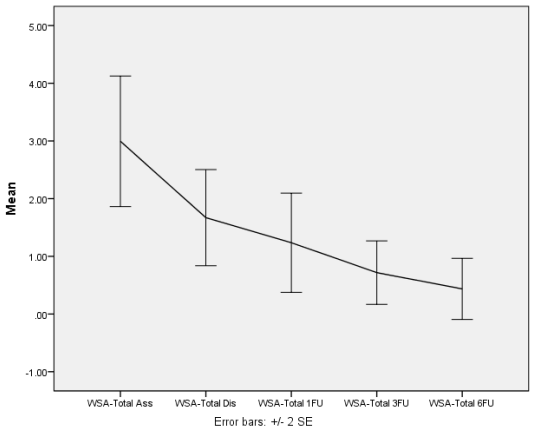

Fig. 1. Sensitivity to change of the WSAS total in 148 treatment completers.

As with any clinical service, achieving perfect outcome scores at all points of assessment is problematic. Therefore, when paired sample t-tests were performed the total numbers of subjects with whom all scores were available at the different assessment stages vary. When comparing the pre-morbid disability score with discharge and all follow-up assessments there was a significant improvement in disability associated with treatment (see table 5).

Table 5.Paired sample t-tests of change over time for the WSAS

	Paired Differences							
				95% CI				
	M	SD	SE	Lower	Upper	t	df	*p.*
Ass-Dis	2.21	2.12	.25	1.70	2.71	8.71	69	< *.001*
Ass-1MFU	2.46	2.03	.28	1.88	3.04	8.55	49	< *.001*
Ass-3MFU	2.53	2.00	.32	1.87	3.19	7.79	37	< *.001*
Ass-6MFU	2.82	2.07	.40	1.98	3.67	6.95	25	< *.001*

Note: Ass = assessment; Dis = Discharge, 1,3,6 MFU = month follow-up

3.5 Differences between treatment completers and non-completers

The WSAS assessment score was tested against completer/non-completers to determine if there was a pre-treatment difference in disability which may have explained their failure to complete treatment. A univariate general linear model was performed on WSAS assessment total score and completion status. No significant differences were found between completers and non-completers.

4. Conclusion

This study examined the psychometric properties of the WSAS, a widely used measure of disability, in 171 treatment seeking problem gamblers and was demonstrated to be a highly

reliable measure of disability with this population with a Cronbach's α of 0.83. Factor analysis of the 5 items revealed a single general disability factor explaining 69% of the variance. The WSAS correlated highly with SOGS, BDI and BAI. The WSAS did not correlate with self-report gambling severity as measured by the subjects own problem statement. However, when comparing the WSAS with a statement of gambling urge there was a high correlation. The WSAS scores fell significantly from pre- to post-treatment and further to 1-, 3-, and 6-month follow-up, indicating good sensitivity to change. In conclusion, the WSAS is a sound and reliable measure of disability with problem gamblers and is sensitive to change in treatment.

The benefits of using the WSAS in this population is evident in that subjects who continue to experience high levels of disability on completion of treatment may be considered vulnerable to future relapse. Therefore, clinicians could, within treatment, target some of the residual disability issues or, towards the end of treatment, identify specific relapse strategies to ensure the remaining disability does not impact on the subject.

4.1 Limitations

This was a self-selecting treatment population who received out-patient cognitive behaviour therapy. This population may have been more severe in gambling severity and as such would indicate higher scores on the WSAS. Further testing of the WSAS in different gambling populations, including non-treatment seeking would provide a better understanding of the sensitivity of the measure as 1) a measure of disability related to gambling experiences and, 2) sensitivity to change across a range of interventions for problem gamblers.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders: DSM-IV*: Amer Psychiatric Pub Inc.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV-TR®*: American Psychiatric Pub.

Andrews, G., Kemp, A., Sunderland, M., Von Korff, M., & Ustun, T. B. (2009). Normative data for the 12 item WHO Disability Assessment Schedule 2.0. *PloS one, 4*(12), e8343.

Battersby, M., Thomas, L., Tolchard, B., & Esterman, A. (2002). The South Oaks Gambling screen: a review with reference to Australian use. *Journal of Gambling Studies, 18*(3), 257-271.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: psychometric properties. *Journal of consulting and clinical psychology, 56*(6), 893.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of general psychiatry, 4*(6), 561.

Ben-Tovim, D., Esterman, A., Tolchard, B., & Battersby, M. (2001). The Victorian gambling screen. *Gambling Research Panel, Melbourne*.

Blix, I., Hansen, M. B., Birkeland, M. S., Nissen, A., & Heir, T. (2013). Posttraumatic growth, posttraumatic stress and psychological adjustment in the aftermath of the 2011 Oslo bombing attack. *Health and quality of life outcomes, 11*(1), 160.

Cella, M., Sharpe, M., & Chalder, T. (2011). Measuring disability in patients with chronic fatigue syndrome: reliability and validity of the Work and Social Adjustment Scale. *Journal of psychosomatic research, 71*(3), 124-128.

Cornelius, L., Van der Klink, J., Groothoff, J., & Brouwer, S. (2011). Prognostic factors of long term disability due to mental disorders: a systematic review. *Journal of occupational rehabilitation, 21*(2), 259-274.

Ekers, D., Richards, D., McMillan, D., Bland, J. M., & Gilbody, S. (2011). Behavioural activation delivered by the non-specialist: phase II randomised controlled trial. *The British Journal of Psychiatry, 198*(1), 66-72.

el-Guebaly, N., Casey, D., Hodgins, D., Smith, G., Schopflocher, D., Currie, S., & Williams, R. (2013). Session 1-3-F: The Alberta Cohorts of Gambling Behaviors An Update.

Garin, O., Ayuso-Mateos, J. L., Almansa, J., Nieto, M., Chatterji, S., Vilagut, G., . . . Burger, H. (2010). Research Validation of the" World Health Organization Disability Assessment Schedule, WHODAS-2" in patients with chronic diseases. *Health and quality of life outcomes, 8*.

Glover, G., Webb, M., & Evison, F. (2010). Improving access to psychological therapies: a review of the progress made by sites in the first roll-out year. *North East Public Health Observatory*.

Goldstein, L., Chalder, T., Chigwedere, C., Khondoker, M., Moriarty, J., Toone, B., & Mellers, J. (2010). Cognitive-behavioral therapy for psychogenic nonepileptic seizures A pilot RCT. *Neurology, 74*(24), 1986-1994.

Hodgins, D. C. (2013). Reliability and validity of the Sheehan disability scale modified for pathological gambling. *BMC psychiatry, 13*(1), 177.

Jansson-Fröjmark, M. (2013). The Work and Social Adjustment Scale as a Measure of Dysfunction in Chronic Insomnia: Reliability and Validity. *Behavioural and Cognitive Psychotherapy*, 1-13.

Kenwright, M., Liness, S., & Marks, I. (2001). Reducing demands on clinicians by offering computer-aided self-help for phobia/panic Feasibility study. *The British Journal of Psychiatry, 179*(5), 456-459.

Kessler, R., Aguilar-Gaxiola, S., Alonso, J., Chatterji, S., Lee, S., Ormel, J., . . . Wang, P. (2009). Special articles. The global burden of mental disorders: an update from the WHO World Mental Health (WMH) surveys. *Epidemiologia e psichiatria sociale, 18*(1), 23.

Leifker, F. R., Patterson, T. L., Heaton, R. K., & Harvey, P. D. (2011). Validating measures of real-world outcome: the results of the VALERO expert survey and RAND panel. *Schizophrenia Bulletin, 37*(2), 334-343.

Lesieur, H. R., & Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): A new instrument for the identification of pathological gamblers. *American Journal of Psychiatry, 144*(9).

Mataix-Cols, D., Cowley, A. J., Hankins, M., Schneider, A., Bachofen, M., Kenwright, M., . . . Marks, I. M. (2005). Reliability and validity of the Work and Social Adjustment Scale in phobic disorders. *Comprehensive psychiatry, 46*(3), 223-228.

McCready, J., Jimenez-Murcia, S., Turner, N., Petry, N., Grant, J., Winters, K., . . . Chapman, H. (2013). Diagnosis of Gambling Disorder: Comparison of DSM-IV and DSM-V.

Mcmillen, J., & Wenzel, M. (2006). Measuring problem gambling: Assessment of three prevalence screens. *International Gambling Studies, 6*(2), 147-174.

Mundt, J. C., Marks, I. M., Shear, M. K., & Greist, J. M. (2002). The Work and Social Adjustment Scale: a simple measure of impairment in functioning. *The British Journal of Psychiatry, 180*(5), 461-464.

Oakes, J., Battersby, M. W., Pols, R. G., & Cromarty, P. (2008). Exposure therapy for problem gambling via videoconferencing: A case report. *Journal of Gambling Studies, 24*(1), 107-118.

Pallanti, S., DeCaria, C. M., Grant, J. E., Urpe, M., & Hollander, E. (2005). Reliability and validity of the pathological gambling adaptation of the Yale-Brown Obsessive-Compulsive Scale (PG-YBOCS). *Journal of Gambling Studies, 21*(4), 431-443.

Petry, N. M. (2003). Validity of a gambling scale for the Addiction Severity Index. *The Journal of nervous and mental disease, 191*(6), 399-407.

Raylu, N., & Oei, T. P. (2004a). The Gambling Related Cognitions Scale (GRCS): Development, confirmatory factor validation and psychometric properties. *Addiction, 99*(6), 757-769.

Raylu, N., & Oei, T. P. (2004b). The Gambling Urge Scale: Development, Confirmatory Factor Validation, and Psychometric Properties. *Psychology of addictive behaviors, 18*(2), 100.

Richards, D. A., & Suckling, R. (2009). Improving access to psychological therapies: Phase IV prospective cohort study. *British Journal of Clinical Psychology, 48*(4), 377-396.

Rousseau, F. L., Vallerand, R. J., Ratelle, C. F., Mageau, G. A., & Provencher, P. J. (2002). Passion and gambling: On the validation of the Gambling Passion Scale (GPS). *Journal of Gambling Studies, 18*(1), 45-66.

Tolchard, B. (1995). Treatment of Gilles de la Tourette syndrome using behavioural psychotherapy: a single case example. *Journal of Psychiatric and Mental Health Nursing, 2*(4), 233-236.

Tolchard, B., & Battersby, M. (2000). Evaluation of the intensive therapy service for problem gamblers an in-patient program. *Australasian Psychiatry, 34*(S1), A67-A67.

Tolchard, B., & Battersby, M. (2001). Nurse behavioural psychotherapy and pathological gambling: An Australian perspective. *Journal of Psychiatric and Mental Health Nursing, 7*(4), 335-342.

Tolchard, B., & Battersby, M. (2010). The Victorian Gambling screen: reliability and validation in a clinical population. *Journal of Gambling Studies, 26*(4), 623-638.

Tolchard, B., & Battersby, M. (2013). Cognitive Behaviour Therapy for Problem Gamblers: A Clinical Outcomes Evaluation. *Behaviour Change, 30*(01), 12-23.

Tolchard, B., & Delfabbro, P. (2013). The Victorian Gambling Screen: Validity and Reliability in an Adolescent Population. *International Journal of Mental Health and Addiction*, 1-12.

Warnock-Parkes, E., Salkovskis, P. M., Rachman, J., Abramowitz, J., Taylor, S., McKay, D., . . . Emery, G. (2012). When the problem is beneath the surface in OCD: The cognitive treatment of a case of pure mental contamination. *Behavioural and Cognitive Psychotherapy, 40*(4), 383.