Do Males and Females Conceptualise Work and Social Impairment Differently Following Treatment for Different Mental Health Problems?

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**ABSTRACT**

The Work and Social Adjustment Scale (WSAS) is used by psychiatric nurses for screening and evaluating patients’ treatment outcomes for a variety of mental health problems. This study investigated longitudinal and gender measurement invariance of WSAS using structural equation modeling within a help-seeking problem gambling sample (n = 445), and an intervention program for depression and anxiety sample (n = 444). The concept of functional impairment was defined by all WSAS items in males and females at pre- and post-treatment assessments. These findings confirm that the WSAS is a robust and efficacious instrument for evaluating treatment outcomes in two differing populations.

**INTRODUCTION AND BACKGROUND**

Mental health conditions are often associated with impairment spanning across important personal, social and work-related domains. Psychiatric nurses perform key clinical care of patients including treatment planning and outcome evaluation. This will often involve decisions ranging from individual-level through to broader service and policy levels. To make such decisions, valid and reliable information needs to be gathered. At the patient level, it is vital for clinicians to record an initial clinical description and chart the subsequent trajectory of patients’ progress. At a service and policy level, data are commonly aggregated; this makes available information to help decision-making about treatment programs and system-level functioning. In a clinical setting, an instrument must be appropriate to different health problems, brief and easy to use (i.e., do not require special training to use; Sharma et al., 2004). It is also vital that the scale used is psychometrically robust.

In more recent times, clinicians and researchers have begun to move away from the previously dominating disease-centric instruments (Fairweather-Schmidt, Batterham, Butterworth, & Nada-Raja, 2016; Maddison, Marlee, Webb, Berry, & Whitelock, 2016), preferring scales or assessments that offer a greater general utility to practice and investigative contexts. One such instrument is the Work and Social Adjustment Scale (WSAS), developed to evaluate functional impairment.

The WSAS was initially validated in patients with depression and obsessive compulsive disorder (OCD) and shown to be sensitive to discrepancies in patient disorder severity and detected patient treatment-related change (Mundt, Marks, Shear, & Greist, 2002). Subsequent validation studies have also established it to be a reliable and valid measure of disorders including anorexia nervosa, chronic fatigue syndrome (CFS), and phobias (Cella, Sharpe, & Chalder, 2011; Mataix-Cols et al., 2005; Tchanturia et al., 2013). Despite these studies having addressed psychometric attributes such as internal consistency, factor structure and sensitivity to change using average total scores, measurement invariance remains to be established. Establishment of measurement invariance—that is, to determine whether the same construct is being measured across key subpopulations—is a fundamental requirement of psychometric instruments when using them to evaluate differences spanning different groups of patients or therapeutic change over time (Vandenberg & Lance, 2000; Widaman, Ferrer, & Conger, 2010).

A variety of intervention-based programs (e.g., South Australian State wide Gambling Therapy Service, beyondblue NewAccess early intervention for depression and anxiety) have now adopted the WSAS as a key outcome measure. Clinicians and managers alike considered WSAS to be a readily interpretable and convenient instrument for screening patients and treatment outcomes. By examining whether the WSAS factor structure remains equivalent across males and females, and over...
time provides a further opportunity to test the clinical and research utility of this instrument. A benefit of investigating gender is that it is usually a readily categorizable attribute, leading to prompt selection of gender-appropriate, individualized care and treatment. Differential gender effects have been found in previous gambling research, including gambling participation patterns (Romild, Svensson, & Volberg, 2016), pathways in behavioral and cognitive aspects of gambling disorder (Smith, Battersby, & Harvey, 2015), and gambling expectancies (Teeters, Ginley, Whelan, Meyers, & Pearson, 2015).

Thus, the current study sought to determine the presence of WSAS measurement invariance and compare latent mean scores between males and females at pre-treatment and post-treatment assessments in two populations to help generalizability of findings within three common disorders (problem gambling, mild depression and anxiety) by determining configural, metric, and finally scalar measurement invariance in the WSAS. Invariance was investigated first between gender, and then over time. It is anticipated that these findings will assist the everyday practice of psychiatric nurses, and other clinicians, by guiding their choice of instrument such that it possesses robust psychometric properties while simultaneously contributing to the evidence-base of psychometric scales.

METHODS

Study Design and Participants

Pre-post treatment data collection underpinned the longitudinal methodology of this study. For sample 1, baseline assessment was conducted at first presentation to an outpatient gambling treatment centre and follow-up at post-treatment. Treatment occurred from January 2010 to August 2015 where mean duration of treatment was 10.6 weeks (SD = 4.3 weeks) and mean client age was 44.30 years (SD = 13.90 years). A total N = 445 records of adult treatment-seeking problem gamblers with WSAS data were available for analysis, and of these 270 (60.7%) were males. The relevant clinical and university human research ethics committees approved the study. Sample 2 comprised data collected between March 2014 and April 2015. A total of 444 clients (196 males, 44.1%; age M = 43.92 years, SD = 14.08) completed the WSAS at first assessment and post-intervention spanning approximately 2 months (M = 8.32 weeks, SD = 1.35). University human research ethics committee granted study approval.

Context

A state-wide service offers free cognitive-behavioral therapy (CBT) for help-seeking problem gamblers in South Australia. Personnel include a psychiatrist, and therapists with professional registration in mental health nursing, psychology, or social work (Battersby, Oakes, Tolchard, Forbes, & Pols, 2008). NewAccess is an adaptation of the UK Improving Access to Psychological Therapies (IAPT) program delivering Low Intensity Cognitive Behavior Therapy (LiCBT) for mild to moderate depression and anxiety. NewAccess coaches receive an initial 6 weeks of intensive training from qualified health professionals (e.g., psychiatric nurses, social worker, and psychologists) followed by ongoing training and specialist supervised practice (Cromarty, Drummond, Francis, Watson, & Battersby, 2016; Koivu, Drummond, Battersby, & Cromarty, 2016).

Work and Social Adjustment Scale

The WSAS is a self-report questionnaire evaluating subjective assessment of functional ability/impairment. The scale contains five items to explore the degree to which the participants’ gambling problems/depression/anxiety affects their ability to function in the following areas: work, home management, social leisure, private leisure, and family and relationships. Each question is answered using a 0 to 8 scale (“not at all” to “very severely”), with higher scores corresponding to greater or more severe functional impairment (Mundt et al., 2002).

Statistical Analysis

Factor analyses were conducted using MPlus software (Version 7.3) (Muthén & Muthén 1998–2015). Full information ML (maximum likelihood) estimation was used to manage missing data. Missing data was assumed to be missing at random. Robust standard errors were used for estimation to account for skewed item distributions.

Measurement Models

A single factor Confirmatory Factor Analysis (CFA) model was specified for WSAS in line with its original purpose as a simple measure of impaired functioning (Mundt et al., 2002). To establish best-fitting CFA models for males and females both separately and then combined, pre-treatment data was analysed first. These measurement models were then applied to post-treatment data. Model fit was assessed at the statistical level using a likelihood-ratio test. A non-significant chi-square statistic (p > 0.05) would indicate that a model near replicates the observed variance-covariance matrix. To investigate discrepancies between model implied data and observed data, goodness-of-fit indices were calculated (Kline, 2011). These indices were the root mean squared error of approximation (RMSEA), the comparative fit index (CFI) and standardised root mean square residual (SRMR). Interpretation of fit indices adheres to those recommended criteria for model fit statistics (Hu & Bentler, 1999).

Measurement Invariance

A three-step approach was used to evaluate longitudinal and gender measurement invariance (Vandenberg & Lance, 2000). First, patterns of common factor loadings were compared between each time point and across gender. If factor loading patterns were similar, then configural invariance was considered to have been established—and subsequent testing was deemed meaningful. Second, common factor loadings were constrained to be equal for “like” items at each time-point to determine presence of metric invariance. Third, items’ respective factor loadings and intercepts were constrained to be equal to test for scalar gender invariance.

Likelihood-ratio tests were also used to compare full models against nested models to identify each type of invariance. Robust errors were calculated from maximum likelihood estimation, which required the use of the Santorra-Bentler scaled chi-square difference test (Muthén & Muthén 1998–2015; Satorra & Bentler, 2001). Measurement invariance was also assessed on the basis of the difference in parameter estimate magnitudes between males and females, and pre- and post-treatment (Sass, 2011).

Satisfactory metric invariance was based on: ΔCFI < 0.01, ΔRMSEA < 0.015 and ΔSRMR < 0.03, as was scalar invariance with exception to SRMR which required ΔSRMR < 0.01 (Chen, 2007; Sass, 2011). Modification indices were calculated to identify where linear constraints may be relaxed to improve model fit (Sörbom, 1989). Each freed constraint was evaluated based on change in chi-square values and significance at the 0.05 level and abandoned when no better model could be achieved. The establishment of at least partial metric invariance was a prerequisite for subsequent tests. The longitudinal CFA models accounted for correlations within and between baseline and post-treatment measures (Vandenberg & Lance, 2000).

To examine if there were discrepancies between males and females WSAS latent factor means at pre-treatment and post-treatment, final models were run to determine scalar invariance, which included (partial) invariant factor loadings for gender and time, and (partial) invariant intercepts for gender. To provide a meaningful interpretation for the magnitude of any significant differences in latent means
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