



EXAMINING THE PSYCHOMETRIC PROPERTIES OF THE JOB-SATISFACTION SURVEY (JSS) IN ADULT ADHD PATIENTS: THE ADULT ADHD - JOB SATISFACTION SCALE (ADHD-JSS).

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ABSTRACT

Introduction: Adult ADHD is well known common psychiatric disorder, and is frequently associated with functional impairments and employment dissatisfaction among employed adults. The Job Satisfaction Survey (JSS-36) consists of thirty six items which was found to have a high reliability and evidence for validity in different employment sittings. However its psychometric properties have not been yet evaluated in adults suffering from ADHD. **Objectives:** The objective of this project is to examine the psychometric properties of the Job Satisfaction Survey in adult ADHD patients. **Method:** Participated in this study male and female consecutive consenting outpatients (18 - 65 years, n = 85) with confirmed diagnosis of ADHD. All patients held regular employment, completed the Job Satisfaction Survey (items = 36), and the Adult ADHD Quality-of Life Scale (AAQoL, 29 items). The study was granted approval by the Conjoint Scientific and Ethics Board at the University of Calgary. **Results:** Several exploratory principal component analyses of patients' responses on the JSS 36-item survey examining perceived satisfaction with employment, resulted in the final modified version "the ADHD job Satisfaction Scale (n=30 items), and in four theoretically meaningful constructs accounting for 57 % of the variance, in responses related to patients' job satisfaction. There was evidence for convergent validity of the scale's factor scores, and an evidence for concurrent validity with AAQoL component scores. The internal consistency reliability of the ADHD job Satisfaction Scale is 0.93 (Cronbach's alpha). **Conclusion:** The ADHD Job-Satisfaction scale (ADHD-JSS) is a 30 item, likert type scale, has adequate internal consistency reliability and a demonstrated convergent, concurrent, and construct validity. It could be used reliably in research to measure the satisfaction to one's job, among adults with ADHD. Also, the ADHD-JSS could be used by employers to evaluate employees areas of dissatisfaction, with the goal of improving the overall work productivity.

KEYWORDS: Job satisfaction, ADHD, reliable, valid, measurements.

INTRODUCTION

During the last two decades, critical work has raised serious questions about the affective status of job satisfaction in terms of its causes as well as its definition and measurement. Job satisfaction is defined as the pleasant or positive affection state, and the pleasurable emotional state resulting from the appraisal of one's job^[1] or the attitude towards one's job,^[2] which develops in the process of evaluating an individual's work experience. In a review, Zhu, 2013 concluded that job satisfaction can be described as the affection-based job satisfaction and the overall positive affective evaluation of the job. According to this definition, job satisfaction is about whether the job stimulates employees' pleasant emotions and positive feelings.^[3]

ADHD is considered as a neurodevelopment disorder. However, many adult patients escape diagnosis as children that would afford them appropriate therapeutic intervention. Adults with ADHD have difficulties with school, work, family interactions, and social activities, as their symptoms may result in significant impairments in educational, occupational, interpersonal, and social functioning. If left untreated, adult ADHD symptoms can cause significant personal, social, and economic burdens that can have negative impact on the overall quality of life.^[4]

The impact of ADHD symptoms on occupational functioning

The impact of untreated adult attention-deficit/hyperactivity disorder (ADHD) in the workplace can be substantial, and employees with ADHD often confront frustration, employer disappointment, and low

performance ratings. Primary care providers who may be treating adults with ADHD are in a unique position to help them obtain the care and support needed to build appropriate skills and manage occupational issues.^[5]

Compared with controls, individuals with ADHD are reported to have lower employment rates, thus lower earnings and lower incomes. To evaluate ADHD symptom impact on individual employment and income, Biederman et al, 2006 examined the differences between a group (n=500) of adults diagnosed with ADHD and an age, and gender-matched control group (n = 501). Authors reported that the average household incomes were significantly lower among individuals with ADHD compared with controls, and that the loss of workforce productivity associated with ADHD was estimated between \$67 billion and \$116 billion.^[6]

Also, Hartge et al, 2018, demonstrated that on average, an individual with ADHD, learning disorders or depression has between 20% - 25 % lower earnings than those without any of these disorders, and Secnik et al, 2005 reported that the probability of being employed is 5 % lower for an individual who has any of the ADHD comorbid disorders.^[7,8]

Patients with ADHD are more likely to suffer from comorbid other psychiatric disorders, most frequently mood and anxiety disorders, and substance use disorders, all of which may add to the negative impact on employment productivity. The reported prevalence of comorbid anxiety disorders among adults with ADHD was 47–53% in studies.^[9]

OBJECTIVES

If it is important for employers to provide support, advocate for and retain good employees, and if employers are concerned about mental health standards, then they should be able to measure employees' attitudes and satisfaction with work utilizing reliable measures with evidence of validity. Author is not aware of reliable tool with evidence of validity to measure employment satisfaction among adults with ADHD. Therefore, the main objective of this study is to examine the psychometric properties of the Job Satisfaction Survey (JSS-36) in a sample of Canadian adults with ADHD diagnosis.^[10]

MATERIAL AND METHOD

Participants

There were 85 participating patients, both men and women, from 19 to 65 years of age (mean=35 years; SD=10.5). The proportion of male to female was 52/33 (60%/40%). All patients were referred in consultation for treatment as outpatients, all were holding regular employment at the time of inclusion in the study. There were 15 patients (17.7%) who held semiskilled jobs, 40 (47 %) who had skilled employment, 23 (27%) as professionals, and 7 (8.3 %) who were running their own

businesses. The “Mini-International Neuropsychiatric Interview” (MINI screen 2001–2005) was used to confirm adult ADHD diagnosis.^[11]

Measurements

The Job Satisfaction Survey (JSS-36)

The Job Satisfaction Survey (JSS-36) consists of 36 items making nine subscales to assess employee attitudes about the job and its aspects. The nine job aspects are; Pay, Promotion, Supervision, Fringe Benefits, Contingent Rewards (performance based rewards), Operating Procedures (required rules and procedures), Coworkers, Nature of Work, and Communication. The internal consistency reliabilities for the subscales (Chronbach's alpha) ranged from 0.71 to .91, based on administering the JSS to 3148 responders from 19 different samples that represented multiple employment organizations.^[10]

The Adult ADHD Quality-of Life Scale (AAQoL)

The AAQoL is a 29 item, likert type scale, with four main domains or components: life productivity, psychological health, relationships and life outlook. It provide specific disease measure of the impact of ADHD on quality of life. The measure has adequate internal consistency reliability coefficient (Cronbach's alpha) was > 0.93 and with demonstrated convergent, discriminant and construct validity. All patients, in the present study completed the AAQoL scale together with the JSS.^[12]

Procedure

The design involved the psychometric assessment of the Job Satisfaction survey (JSS, items = 36) and adapt it to measure job satisfaction among adults patients with ADHD. All patients provided informed consent to participate, and all patients completed both the Job Satisfaction Survey (JSS-36), and the Adult ADHD Quality-of Life Scale (AAQoL). Patients were asked to rate their perceptions about different aspects of employment on each item of the JSS questionnaire on a six - point Likert scale (from 1= strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = agree slightly, 5 = agree moderately, and 6 = agree strongly). All patients were also asked to complete the Adult ADHD Quality-of Life Scale (AAQoL), to report their experiences about how severely and frequently ADHD impacted their life over the last two weeks. The AAQoL was rated on five-point Likert Scale, (from 1 = Not at all, 2 = little, 3 = somewhat, 4 = a lot, and 5 = Extremely), to measure the impact of ADHD on quality of life.

RESULTS

Patients' responses

Table1, displays patients' responses on each item of the nine subscales of the Job Satisfaction Survey (JSS-36 items). Each subscale score is calculated by the sum scores of each item of the subscale divided by the number of items of this subscale. Close inspection of table 1, suggests that there was modest satisfaction in many job aspects, and that in some aspects of the

employment, there was an overall dissatisfaction or negative experience with the job.

Table 1: Patients' (n=85) responses on each item of the original JSS (n = 36 items).

SUBSCALE ITEM PERCEPTIONS	min-max	mean (SD)
1. NATURE OF WORK		
I sometimes feel my job is meaningless.	1- 6	3.97(1.60)
My job is enjoyable.	1- 6	4.27(1.48)
I feel a sense of pride in doing my job.	1- 6	4.78(1.15)
I have too much paper work	1- 6	3.41(1.75)
I find I have to work harder at my job because of the incompetence of people I work with.	1- 6	3.39 (1.50)
I like doing the things I do at work.	1- 6	4.51(1.33)
I have too much to do at work	1- 6	3.74(1.58)
		4.01 (1.48)
2. PAY		
I feel I am being paid a fair amount for the work I do.	1- 6	4.12(1.41)
Raises are too few and far between	1- 6	3.05(1.55)
I feel satisfied with my chances for salary increases.	1- 6	3.45(1.61)
I feel unappreciated by the organization when I think about what they pay me.	1- 6	3.51 (1.73)
		3.53(1.57)
3. PROMOTION		
There is really too little chance for promotion on my job	1- 6	3.50(1.63)
Those who do well on the job stand a fair chance of being promoted.	1- 6	3.96(1.62)
I am satisfied with my chances for promotion.	1- 6	3.42(1.58)
People get ahead as fast here as they do in other places.	1- 6	3.75(1.56)
		3.66(1.6)
4. SUPERVISION		
My supervisor is quite competent	1- 6	4.51(1.46)
My supervisor is unfair to me.	1- 6	1.41(1.59)
I like my supervisor.	1- 6	4.67(1.43)
My supervisor shows too little interest in the feelings of subordinates.	1- 6	3.84(1.66)
		3.61(1.53)
5. REWARDS		
When I do a good job I receive the recognition for it that I should receive	1- 6	4.04(1.47)
There are few rewards for those who work here	1- 6	3.57(1.62)
I don't feel my efforts are rewarded the way they should be.	1- 6	3.56(1.61)
I do not feel that the work I do is appreciated.	1- 6	3.96(1.54)
		3.78(1.56)
6. ORGANIZATIONAL RULES & PROCEDURES		
Many of our rules and procedures make doing a good job difficult	1- 6	3.00 (1.50)
My efforts to do a good job are seldom blocked by red tape	1- 6	3.76(1.64)
work assignments are not fully explained.	1- 6	3.28(1.65)
The goals of this organization are not clear to me.	1- 6	4.39 (1.49)
I often feel that I do not know what is going on with the organization.	1- 6	3.36 (1.61)
		3.56(1.58)
7. BENEFITS		
There are benefits we do not have which we should have.	1- 6	3.52 (1.67)
The benefit package we have is equitable.	1- 6	4.05(1.56)
The benefits we receive are as good as most other organizations offer	1- 6	4.18(1.56)
I am not satisfied with the benefits I receive.	1- 6	3.87(1.58)
		3.91(1.57)
8. COWORKERS		
I enjoy my coworkers	1- 6	4.83(1.23)
I like the people I work with	1- 6	4.82(1.28)
		4.82(1.26)
9. COMMUNICATION		
Communications seem good within this organization.	1- 6	3.76(1.67)

There is too much bickering and fighting at work.	1- 6	3.92 (1.88)
		3.84(1.77)

1= Disagree very much, 2= Disagree moderately, 3 = disagree slightly, 4 = Agree slightly, 5 =Agree moderately, 6 = Agree very much (Adapted from

Factor Analysis, construct validity

Several exploratory principal component analyses were conducted on patients' responses of the original JSS 36-item scale. Based on the Kaiser rule (eigen values > 1.0) the percentage of variance accounted for, and based on the cohesiveness of the factors (i.e., patterns of loadings), a four factor solution appeared optimum, when four items with loadings below 0.4 excluded from the original JSS. Also, there were two items related to the kind of and amount of work that were excluded for being perceived

by some patients as ambiguous or confusing. This resulted in the final version of the scale (the ADHD Job satisfaction scale), which consists of 30 items. The four factors extracted accounted for 57 % of the variance in responses related to patients' perceptions related to job experiences, and the varimax rotation converged in sixteen iterations. Table2 contains the factor loadings, the internal consistency reliability values, and the proportion of observed variance for each factor.

Table 2: Rotated factor matrix on the ADHD Job Satisfaction Scale (ADHD-JSS, 30 items).

ADHD JSS items	Factor 1	Factor 2	Factor 3	Factor 4
I like doing the things I do at work.	0.77			
My job is enjoyable.	0.74			
I feel a sense of pride in doing my job.	0.72			
I sometimes feel my job is meaningless.	0.68			
I enjoy my coworkers	0.65			
I like my supervisor.	0.62			
I do not feel that the work I do is appreciated.	0.61	0.44		
My supervisor is unfair to me.	0.59	0.48		
My supervisor shows too little interest in the feelings of subordinates.	0.59	0.5		0.44
I like the people I work with	0.58		0.43	
There are few rewards for those who work here	0.45			0.44
I don't feel my efforts are rewarded the way they should be.	0.45			
Many of our rules and procedures make doing a good job difficult		-0.72		
There is too much bickering and fighting at work.		0.69		
I find I have to work harder at my job because of the incompetence of people I work with.		-0.68		
work assignments are not fully explained.		-0.63	-0.41	
I often feel that I do not know what is going on with the organization.		-0.56		
Communications seem good within this organization.		0.56		
The goals of this organization are not clear to me.		0.56		
My supervisor is quite competent		0.54	0.42	
I am satisfied with my chances for promotion.			0.72	
I feel satisfied with my chances for salary increases.			0.69	
People get ahead as fast here as they do in other places.			0.62	
I feel I am being paid a fair amount for the work I do.			0.51	
Those who do well on the job stand a fair chance of being promoted.	0.43		0.51	
The benefit package we have is equitable.				0.77
I am not satisfied with the benefits I receive.				0.72
The benefits we receive are as good as most other organizations offer.				0.69
There are benefits we do not have which we should have.				0.52
I feel unappreciated by the organization when I think about what they pay me.				0.51
Internal Consistency (Cronbach's alpha) of each factor	0.91	0.88	0.83	0.81
Proportion of observed variance for each factor (%)	34.9	9.4	7.6	5.2
Job Satisfaction score of each factor	55.2	41.8	30.1	27.5

Principal components extraction, Varimax rotation with Kaiser normalization. Rotation converged in sixteen iterations.

†Factor loadings ≤ 0.40 have been excluded.

Factor1: Satisfaction with the job, ambivalence towards supervision

Factor 2: Dissatisfaction with the organizational rules, the supervisor and workmates

Factor 3: Satisfaction with salary and chances for promotion

Factor 4: Ambivalent attitude to benefits

Factor 1: Satisfaction with the job, ambivalence towards supervision

This factor consists of nine items, has an internal consistency of 0.89, and explains 34.9% of the observed variance. It refers to the satisfaction, enjoyment and perceiving pride in the work they do, but having ambivalent attitude towards the supervisor.

Factor 2: Dissatisfaction with the organizational rules, the supervisor and workmates

This factor consists of nine items, has an internal consistency of 0.83, and explains 9.4 % of the observed variance. This component refers to dissatisfaction with the organizational rules, procedures, and concerns about the fairness of the supervisor, and the competence of co-workers.

Factor 3: Satisfaction with salary and chances for promotion

This factor consists of six items, has an internal consistency of 0.83 and explains 7.6 % of the observed

variance. It refers to perceived satisfaction with fair payments, and good chances for promotion, but with the perceived concerns of not properly rewarded.

Factor 4: Ambivalent attitude to benefits

This factor consists of seven items, has an internal consistency of 0.60 and explains 5.2 % of the observed variance. It refers to major perceived dissatisfaction with the organizational system. It refers to the vague understanding of the organizational plans and of those related to providing fair benefits and rewards for employees.

Factor scores were obtained by the sum of the scores of the individual items divided by the number of items of each factor.

(APPENDIX A) displays the final version of the adult ADHD job satisfaction scale (ADHD-JSS).

Evidence for convergent and concurrent validity

The four factors mean scores of the adult ADHD job satisfaction scale (ADHD-JSS) were significantly correlated at ($p < .001$), supporting evidence for convergent validity of the ADHD-JSS (table 3).

Table 3: Pearson's product moment correlations between ADHD-JSS factor scores.

	Factor 2	Factor 3	Factor 4
Factor 1	.71**	.66**	.62**
Factor 2		.43**	.46**
Factor 3			.62**

** Correlations is significant at .001

Table 4, displays the intercorrelation between the four factor mean scores of the ADHD-JSS with the four component scores of the adult ADHD Quality-of Life Scale (AAQoL). There were inverse correlation between the scores of these two scales, supporting an evidence for

concurrent validity of the ADHD-JSS. There were significant inverse correlations between the ADHD - JSS factor scores, and two components of the AAQoL, namely; the psychological health component and the quality of relationship component scores.

Table 3: Pearson's product moment correlations of the ADHD-JSS factors with AAQoL.

ADHD JSS components	AAQoL component 1	AAQoL component 2	AAQoL component 3	AAQoL component 4
JSS Factor 1	- .118	- .43**	- .070	- .31**
JSS Factor 2	- .03	- .21	- .03	- .19
JSS Factor 3	- .09	- .27*	- .07	- .22*
JSS Factor 4	- .12	- .23*	.18	- .11

*Correlations is significant at .05

**Correlations is significant at .001

AAQoL component 1: Productivity

AAQoL component 2: Psychological health

AAQoL component 3: Life outlook

AAQoL component 4: Relationship

Appendix A: The Adult ADHD Job Satisfaction Scale (ADHD-JSS).

The Adult ADHD Job Satisfaction Scale Adel Gabriel, Adapted and modified with permission from Spector, P. E. (1985).		Name: _____ Date: ____/____/____					
ADHD JSS items Please check the appropriate boxes, to reflect your perception of each item using the following rating guide:		Disagree very much	Disagree moderately	Disagree slightly	Agree slightly	Agree moderately	Agree very much
1	I like doing the things I do at work.	1	2	3	4	5	6
2	My job is enjoyable.	1	2	3	4	5	6
3	I feel a sense of pride in doing my job.	1	2	3	4	5	6
4	I sometimes feel my job is meaningless.	1	2	3	4	5	6
5	I enjoy my coworkers	1	2	3	4	5	6
6	I like my supervisor.	1	2	3	4	5	6
	I do not feel that the work I do is appreciated.	1	2	3	4	5	6
8	My supervisor is unfair to me.	1	2	3	4	5	6
9	My supervisor shows too little interest in the feelings of subordinates.	1	2	3	4	5	6
10	I like the people I work with	1	2	3	4	5	6
11	There are few rewards for those who work here	1	2	3	4	5	6
12	I don't feel my efforts are rewarded the way they should be.	1	2	3	4	5	6
13	Many of our rules and procedures make doing a good job difficult	1	2	3	4	5	6
14	There is too much bickering and fighting at work.	1	2	3	4	5	6
15	I find I have to work harder at my job because of the incompetence of people I work with.	1	2	3	4	5	6
16	Work assignments are not fully explained.	1	2	3	4	5	6
17	I often feel that I do not know what is going on with the organization.	1	2	3	4	5	6
18	Communications seem good within this organization.	1	2	3	4	5	6
19	The goals of this organization are not clear to me.	1	2	3	4	5	6
20	My supervisor is quite competent	1	2	3	4	5	6
21	I am satisfied with my chances for promotion.	1	2	3	4	5	6
22	I feel satisfied with my chances for salary increases.	1	2	3	4	5	6
23	People get ahead as fast here as they do in other places.	1	2	3	4	5	6
24	I feel I am being paid a fair amount for the work I do.	1	2	3	4	5	6
25	Those who do well on the job stand a fair chance of being promoted.	1	2	3	4	5	6
26	The benefit package we have is equitable.	1	2	3	4	5	6
27	I am not satisfied with the benefits I receive.	1	2	3	4	5	6
28	The benefits we receive are as good as most other organizations offer.	1	2	3	4	5	6
29	There are benefits we do not have which we should have.	1	2	3	4	5	6
30	I feel unappreciated by the organization when I think about what they pay me.	1	2	3	4	5	6

Internal consistency reliability of the ADHD-JSS

The internal consistency reliability (Cronbach's alpha) of the modified ADHD Job Satisfaction Scale (ADHD-JSS) was 0.93 for the 30 items.

DISCUSSION

Authors examined and modified the psychometric properties of the modified the Job Satisfaction Survey^[10] (JSS-36 items), in a Canadian outpatient sample of patients suffering from ADHD. To the knowledge of the author, this is the first instrument modified to measure job satisfaction among adults with attention deficit disorder.

The main findings of the present study are

1. The modified adult ADHD job satisfaction scale (DHD-JSS) consists of (items = 30) had an overall reliability internal consistency of 0.93.
2. From examining patients' responses on completing the JSS-36, there were modest satisfaction attitudes across responses and there were ambivalent attitudes towards the supervision, and dissatisfaction benefits and with the organizational rules.
3. Factor analysis revealed four meaningful components that explained 57 % of the variance for this scale, providing evidence for construct validity. There is evidence for convergent and concurrent validity with the adult ADHD Quality-of Life Scale (AAQoL) scores.

Evidence for construct and convergent validity

In the present study, the attention deficit symptoms, ADHD symptoms scale items clustered into four components or factors, which are theoretically meaningful and cohesive within the framework of satisfaction in the workplace. The four factors are; Factor 1, Satisfaction with the job, ambivalence towards supervision, Factor 2: Dissatisfaction with the organizational rules, the supervisor, and workmate's competence, Factor 3: Satisfaction with salary and chances for promotion, and Factor 4: Ambivalent attitude towards benefits. There were significant correlations between the four factors supporting evidence for convergent validity of the modified instrument.

It was demonstrated in several large published studies that ADHD impacts negatively on patients' satisfaction, and quality of life, all of which lend credibility to the construct validity of the ADHD-JSS. For example, in a large international WHO study of employed individuals (n = 7075, paid or self-employment), ADHD patients had statistically significant, of 22.1 annual days of excess lost role performance compared to otherwise similar respondents without ADHD (de Graaf et al. 2008).^[13, 14] Also, (Biederman and Faraone, 2003) reported that the average household incomes were significantly lower among individuals with ADHD compared with controls, regardless of academic achievement or personal characteristics.^[6] Also, in a review, (Sarkis, 2014) reported that employment levels, earning power, and productivity were reduced among individuals with ADHD compared with those without ADHD. Other investigators found that employers reported that the costs of employing individuals with ADHD were higher because of work absences and lost productivity.^[15]

Evidence for concurrent validity

The significant inverse correlations between the ADHD - JSS factor scores, and the AAQoL four component scores, especially the component scores of psychological health and relationship quality, reflects the fact that those who were satisfied with their employment, were more likely to enjoy positive psychological health, healthy relationships and an overall good quality of life. This supports an evidence for concurrent validity for the ADHD Job satisfaction scale (ADHD -JSS). Our findings are supported in literature. For example, in literature examining the consequences of adult ADHD adults it was concluded that if left untreated, adult ADHD can cause significant personal, social, and economic burdens that impact negatively on the overall quality of life (Goodman, 2007; Harpin, 2005). These findings replicate and extend the findings of other studies, and lend credibility to the construct validity of the ADHD-JSS.^[4,16]

Strengths of the study

By adopting regular evaluations of job satisfaction among employees at the work place, utilizing reliable measures with evidence of validity, employers can gain a

clearer picture of what human resource adjustments are needed for appropriate changes can be made to support ADHD patients stay in their employment. For example, work assignments for patients with ADHD may need to be tailored to their strengths and weaknesses. The appropriate occupational accommodations may need to be applied for ADHD patients' optimal productivity.

CONCLUSION AND RECOMMENDATIONS

A self report reliable instrument to measure adult patients with Attention Deficit disorder, the Adult ADHD Job Satisfaction Scale (ADHD-JSS) was developed, by modifying the JSS 36-item survey. There is evidence for construct, convergent and concurrent validity for the ADHD-JSS. Future research should examine the impact of the stimulant treatments on job satisfaction and on quality of life among adult patients with ADHD, with or without comorbid psychiatric disorders.

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