

Reviewer ID: Suzanne Noreau, John Zhu, Jeremy Mak, Joanne Chi			
Type of Outcome Measure: Hospital Anxiety and Depression Scale (HADS)			Total articles: 10
Author ID Year	Study Design	Setting	Population (sample size, age) and Group
Menon et al. 2016	Prospective observational study	Research hospital in India	N=127 (35F, 92M) Age: 32.71 ±13.08 Time Since Injury (days): 76.22 ± 82.5 Myelopathy patients  Admission AIS: AIS A: 58 AIS B: 18 AIS C: 36 AIS D: 11  Discharge AIS: AIS A: 47 AIS B: 16 AIS C: 26 AIS D: 34
Munce et al. 2016	Online Survey	Rick Hansen Institute and an outpatient spinal clinic	N=99 Age: 50.5 ± 1.0 Time Since Injury (years): 17.5 ± 12.3
Ebrahimzadeh et al. 2014	Cross sectional design		N=52 (52M) Age: 23.6 ± 8.2 War veterans with SCI Time Since Injury: ~30 years ago Paraplegic: 37 Tetraplegic: 6
Paker et al. 2013	Reliability study of Turkish HADS	An outpatient clinic of a hospital between Jan 1, 2010, and Feb 28, 2011	N=175, 143 male Mean age 35, SD=13 Mean time since injury = 17mth, SD=33 AIS-A/B/C/D: 81/27/45/22 Paraplegia/Tetraplegia: 131/44 SCI caused by falls: 47.4%; MVA: 36.6%
Müller et al. 2012	Cross-sectional multicenter study	3 major SCI rehabilitation centers in Switzerland (Paraplegic Centre, University Clinic Balgrist, Zurich; the Swiss Paraplegic Centre, REHAB Basel; and the Swiss Paraplegic	N=102 Mean age: 56.5±16.7 years 74.5% Male 61.8% Paraplegic 38.2% Tetraplegic 26.5% complete injury, 73.5% incomplete injury Time since onset of injury: 43.6±13.5 months

		Centre(SPZ), Nottwil )	
Elfstrom et al. 2007	Cross-sectional, questionnaire to investigate the psychometric performance of the Spinal Cord Lesions – Coping strategies Questionnaire (SCL-CQ) in four different countries.	Austria, Germany, Switzerland and UK.	<p>N=355            Male=279            Female=74            Missing=2            Mean age=49            Mean age at lesion=27.8            Austria=44            Germany=172            Switzerland=27            UK=112</p> <p>Level of lesion            Cervical=147            Thoracic=155            Lumbar=23            Sacral=1            Missing=29</p> <p>Complete paraplegia=162            Complete tetraplegia=85            C=Incomplete paraplegia=32            Incomplete tetraplegia=58            Missing=18</p>
Woolrich et al. 2006	Cross-section to evaluate the psychometric properties of the HADS using a large community sample whom had recently completed the HADS in a larger study. Because of the constraints of the larger study, full psychometric evaluation could not be directly assessed.	Community sample in the UK	<p>N=963 (81% male)            Mean age 48.1±12.7yrs (range 20-97yrs)</p> <p>Participants of a larger study on the impact of sport and athletic identity in people with SCI.            65.2% paraplegic, 34.8% tetraplegic            Mean DOI 19.5±12.26yrs (range 2-56yrs)</p>
Berry & Kennedy 2003	Consecutive Series, Psychometric validation study	National Spinal Cord Injuries Centre, Stroke Mandeville Hospital, UK	<p>43 (SCI) in-patients; 38M, 5F ; avg. age 42.19±14.6 years</p> <p>Spinal Cord Injury            Complete tetraplegia = 13.9%            Incomplete tetraplegia = 37.2%            Complete paraplegia = 23.3%            Incomplete paraplegia = 25.6%</p>
Middleton et al. 2003	Descriptive, correlational study, validation study of a new instrument	Moorong Spinal Unit of the Royal Rehabilitation Centre Sydney, Sydney, New South Wales, Australia.	<p>Sample 1: People with SCI living in the community who previously were at in-patient rehabilitation            N=36, 28 male            Mean age 36.33 (SD = 9.52)            Mean time post-trauma 11.23 (SD = 9.67) years            11 paraplegia, 25 tetraplegia            15 incomplete, 21 complete</p> <p>Sample 2: People who had recently sustained a SCI and were currently enrolled at in-patient rehabilitation</p>

			<p>N=31, 23 male          Mean age 31.48 (SD = 10.46)          Mean time post-trauma 2.01 (SD = 2.50) months          21 paraplegia, 10 tetraplegia          13 incomplete, 18 complete</p> <p>Sample 3: People with SCI living in the community who previously were at in-patient rehabilitation          N=108, 30 male          Mean age 45.26 (SD = 15.99)          Mean time post-trauma 7.92 (SD = 9.83) years          66 paraplegia, 42 tetraplegia          58 incomplete, 49 complete</p>
Kreuter et al. 1996	Controlled survey	Postdischarge community setting	<p>SCI n= 75 (64 male, 11 female)          Mean age: 33 years (range 19-76)          Control n= 155 (119 male, 36 female)          Mean age: 30 years (range 19-79)</p> <p>38% tetraplegia Frankel A, B, or C          12% tetraplegia Frankel D          32% paraplegia Frankel A, B, or C          18% paraplegia Frankel D</p>

**1. RELIABILITY**

Author ID	Internal Consistency	Test-retest, Inter-rater, Intra-rater
Müller et al. 2012	Cronbach's alpha: Anxiety subscale: 0.72 Depression subscale: 0.82	
Woolrich et al. 2006	<b>Cronbach's alpha.</b>  Anxiety: $\alpha=0.85$ ( $\alpha=0.86$ if item 11 was removed, but $\alpha$ was lower if any other item was removed).  Depression: $\alpha=0.79$ ( $\alpha$ remained the same if item 14 was removed, but was lower if any other item was removed).	No data available
Berry & Kennedy 2003	Anxiety: $\alpha=0.8463$ Depression: $\alpha=0.8122$	No data available
Paker et al. 2013	Cronbach's alpha: Anxiety subscale: 0.90 Depression subscale: 0.77	

**2. VALIDITY**

Author ID	Validity
Middleton et al. 2003	Spearman correlations of Moorong Self-Efficacy Scale with (Sample 1 only, N=36): HADS anxiety: -0.58 (P<0.001) HADS depression: -0.58 (P<0.001)
Elfstrom et al. 2007	Pearson's r correlation of the HADS with SCL Coping Strategy Questionnaire (different construct): Acceptance w/ Anxiety=-0.45 Depression=-0.58

	<p>Fighting Spirit w/          Anxiety=-0.40          Depression=-0.49</p> <p>All values negative, as expected.          All were <math>P &lt; .01</math></p>
Woolrich et al. 2006	<p><b>Construct validity.</b>  <i>HADS scores were correlated with those from the Life Satisfaction Questionnaire (LSQ).</i>          LSQ scores were significantly and negatively correlated with the HADS total scores (Pearson's <math>r = -0.585</math>, <math>P &lt; .001</math>) and the anxiety (<math>r = -0.419</math>, <math>P &lt; .001</math>) and depression (<math>r = -0.66</math>, <math>P &lt; .001</math>) subscale scores.</p> <p><b>Factor Analysis.</b>          A two-factor solution accounted for 51.2% of the variance (factor 1: 40%; factor 2: 11.2%). All items loaded onto the correct factor, except item 7 ("I can sit at ease and feel relaxed"), which corresponded to the depression, not anxiety, factor; however, item 1 ("I feel tense and wound up") also loaded onto the depression factor and item 14 ("I can enjoy a good book, radio or TV programme") loaded onto the depression factor as expected, but at a minimally significant level.</p> <p>Factor analysis was performed separately for males, females, tetraplegics and paraplegics. The two factor solution accounted for the following percentage of the variance: males 51%, females 52.2%, tetraplegics 49% and paraplegics 52.6%. Anxiety accounted for most of the variance for females (41.6%), whereas depression accounted for most of the variance for the three other groups (36.3-41.9%). Again, item 1, 7 and 14 showed variable loadings.</p>
Berry & Kennedy 2003	<p>Needs Assessment Checklist (NAC) and Hospital Anxiety and Depression Scale (HADS) subscale:          Psychological Issues (mood subsection) &amp; anxiety (<math>r = -0.709</math>), depression (<math>r = -0.633</math>), and combined scales (<math>r = -0.726</math>)          Psychological Issues (Full-Scale) &amp; anxiety (<math>r = -0.501</math>), depression (<math>r = -0.466</math>), and combined scales (<math>r = -0.523</math>)</p> <p>All correlations are significant at <math>P \leq .01</math></p>
Kreuter et al. 1996	<p>Pearson's r correlations:  <u>Sexual Adjustment (SAS) Scale &amp; HADS:</u>          SCI persons: <math>r = -0.49</math>, (<math>P &lt; .001</math>)          Controls: <math>r = -0.29</math>, (<math>P &lt; .001</math>)</p> <p><u>Emotional Quality of the Relationship &amp; HADS:</u>          SCI persons: <math>r = -0.38</math> (<math>P &lt; .01</math>)          Controls: <math>r = -0.38</math> (<math>P &lt; .001</math>)</p>
Ebrahimzadeh et al. 2014	<p><u>Depression</u> portion negatively correlated with physical component summary of SF36 (<math>r = -0.37</math>, <math>p = 0.006</math>)  <u>Anxiety</u> portion negatively correlated with mental component summary of SF36 (<math>r = -0.44</math>, <math>p = 0.001</math>)</p>
Munce et al. 2015	<p>MSES (Moorong Self-Efficacy Scale)  <u>Depression</u> portion negatively correlated with MSES (<math>r = -0.560</math>, <math>p &lt; 0.01</math>)  <u>Anxiety</u> portion negatively correlated with MSES (<math>r = -0.315</math>, <math>p &lt; 0.01</math>)</p>
Menon et al. 2016	<p>Change in HADS-depression and change in BI          Spearman's rho: 0.221 (<math>p = 0.024</math>, significant)          Change in HADS-depression and change in SCIM III          Spearman's rho: 0.290 (<math>p = 0.027</math>, significant)</p>
<b>3. RESPONSIVENESS</b> – no data available	
<b>4. FLOOR/CEILING EFFECT</b> – no data available	
<b>5. INTERPRETABILITY</b>	
<b>Author ID</b>	<b>Interpretability</b>
Woolrich et al. 2006	<p>HADS-A: Hospital Anxiety and Depression Scale – Anxiety subscale          HADS-D: Hospital Anxiety and Depression Scale – Depression subscale          Scores reported below are in the form: mean (SD)</p>

	<b>Sample</b>	<b>HADS-A</b>	<b>HADS -D</b>	<b>HADS-total</b>
	Total	6.9 (4.2)	5.5 (3.7)	12.3 (7.1)
	Male	6.7 (4.2)	5.5 (3.8)	12.1 (7.1)
	Female	8.1 (4.2)	5.5 (3.7)	13.2 (7.2)
	Tetraplegic	7.0 (4.0)	5.9 (3.5)	12.7 (6.6)
	Paraplegic	6.9 (4.3)	5.4 (3.8)	12.1 (7.4)
Berry & Kennedy 2003	Mean (SD) scores of HADS subscales HADS-Anxiety: 5.14 (4.32) HADS-Depression: 5.51 (4.17)			
Elfstrom et al. 2007	HADS scores:			
	<b>Sample:</b>	<b>HADS-Anxiety mean (SD) score:</b>		<b>HADS-Depression mean (SD) score:</b>
	Austria	5.00 (3.89)		3.19 (2.98)
	Germany	5.60 (3.16)		3.43 (2.91)
	Switzerland	5.00 (4.21)		3.48 (3.37)
	UK	7.19 (4.21)		5.39 (3.97)
Total	6.00 (3.79)		4.06 (3.46)	