Reviewer ID: Mohit Singh, Nicole Elfring, Brodie Sakakibara, John Zhu, Jeremy Mak, Risa Fox			
Type of Outcome Measure: SF-36			**Total articles:** 14
Author ID Year	**Study Design**	**Setting**	**Population (sample size, age) and Group**
Andresen et al. 1999	Cross-sectional	Midwestern US veteran SCI program	Subjects were selected randomly from 454 patients at a regional veterans' SCI program. 183 veterans with SCI; ranging in age from 21-81 years were used. (mean=50.5) Level of Injury: Cervical – 86 Thoracic – 78 Lumbar - 8
Anton et al. 2008	2-week methodologic study to assess the internal consistency, reliability and construct validity of the FSS.	A tertiary spinal cord rehab facility in Vancouver, Canada.	N=48 Male=31 Female=17 Mean age=40.4 Mean time since injury=14.9 years Major cause of injury=motor vehicle collision=27 Motor complete SCI=48 Tetraplegia=26 AIS grade A injuries=30
Ataoglu et al. 2013	Cross sectional	Inpatient rehab center	N= 140 (36F, 104M) Age: 36.2 ±13.5 Time since SCI (months): 25.2 ± 43.9 AIS A: 79 AIS B-E: 61
Forchheimer et al. 2004	Cross-sectional	Major university hospital in the Midwest	N=215 (78.5% men) Mean age=38.8 ± 14.5 years SCI participants were 1 to 13 years post injury
Golhasani-Keshtan et al. 2013	Cross-sectional validation of Persian Version of CHART	Janbazan Clinic of Mashhad, northeast of Iran	N=52, 52M 0F Mean age 49.3, SD=7.9, 38~80
Horner-Johnson et al. 2010	Cross-sectional survey	General community	206 participants (54 SCI, 36 no disability, 25 loss of vision, 23 loss of hearing, 68 mental health disability) – results reported separately for each group. For the 54 SCI participants: 20 women (37%) mean age: 46.31±10.7
King & Roberts	Cross-sectional (sampled over	Veterans	N=88

2002	1 year)	Administration Neurosurgery Clinic	Mean age: 56.8±11.2, range 29-84 88% men 36% had previous cervical spinal surgery.
Lee et al. 2009	SF-36 scores collected at baseline and on completion of a randomized controlled trial	New South Wales, Australia	N=305, 83% male Mean age 44 Mean time since SCI onset: 14 years 100% had SCI and neurogenic bladder 55% with tetraplegia 49% with complete SCI
Lin et al. 2007	Cross-sectional	Subjects from a Taiwan nationwide SCI registry	N=187 (151 men) Mean Age = 50.3 years Mean time since injury = 7.4 years 48 incomplete tetraplegia 28 complete tetraplegia 73 incomplete paraplegia 38 complete paraplegia
Miller et al. 2008	Methodological 2 week re-test study	Tertiary care centre in Vancouver, BC	N = 47 individuals, Male = 30 Female = 17 Mean age = 40.6 Subject 19 years and older who had their SCI for 1 or more years. AIS A = 29 AIS B = 18
Raichle et al. 2006	Cross-sectional	US Northwest home survey questionnaire	N = 127 Male = 92 Female = 35 Age range = 21 to 88 High tetraplegia = 18 Low tetraplegia = 40 High paraplegia = 14 Paraplegia = 42 Low paraplegia = 11 Missing data = 2
Tramonti et al. 2014	Cross sectional	Italy	N= 40 (12F, 28M) Age: 54.25 ±12.96 Time since SCI (years): 8.27 ± 7.74 AIS A-C: 27 AIS D: 13
Unalan et al. 2015	multicenter, prospective validation study of the Turkish SCIM III	Rehabilitation centers of three hospitals in Turkey	All participants: N=204, 144 male Aged 18~80, mean 39.7, SD=13.7 Mean duration of injury 75.4 months, SD=85.2 165 traumatic, 66 tetraplegia, 104 complete, 104 AIS-A, 29 AIS-B, 35 AIS-3, 36 AIS-D Subgroup:

			N=49, 29 male Mean age 38.4, SD=14.3 Mean duration of injury 60.0 months, SD=55.3
van Leeuwen et al. 2012	Cross-sectional study 5 years after discharge from inpatient rehabilitation	Eight Dutch rehabilitation centres with specialized SCI units.	145 subjects (104 male, 41 female) mean age: 45.4±13.7 Incomplete paraplegia: 27 Complete paraplegia: 65 Incomplete tetraplegia: 16 Complete tetraplegia: 37

1. RELIABILITY

Author ID	Internal Consistency	Test-retest, Inter-rater, Intra-rater
Forchheimer 2004	Average level: α=0.82 Range: α = 0.76 (Bodily Pain scale) to 0.90 (Physical Functioning and General Health scales)	No data available
King & Roberts 2002	Cronbach's α > 0.7 for all 8 domain scales, the physical component summary (PCS), and the mental component summary (MCS): Domains scales: α=0.79 (general health) to 0.91 (physical functioning) PCS: α= 0.92 MCS: α= 0.92	No data available
Lin et al. 2007	Physical Functioning: α= 0.98 Role Physical: α= 0.94 Bodily Pain: α= 0.79 General Health: α= 0.82 Vitality: α= 0.76 Social Functioning: α= 0.72 Role Emotional: α= 0.89 Mental Health: α= 0.78 Good internal consistency.	10 subjects were contacted for re-assessment by same initial interviewer within 2 weeks. Test-retest (intra-rater) reliability: Physical Functioning: ICC= 0.71 Role Physical: ICC= 0.89 Bodily Pain: ICC= 0.87 General Health: ICC= 0.85 Vitality: ICC= 0.93 Social Functioning: ICC= 0.93 Role Emotional: ICC= 0.99 Mental Health: ICC= 0.77 10 subjects were contacted for re-assessment by different initial interviewer within 2 weeks. Test-retest (inter-rater) reliability: Physical Functioning: ICC= 0.67 Role Physical: ICC= 0.90 Bodily Pain: ICC= 0.70 General Health: ICC= 0.41 Vitality: ICC= 0.86 Social Functioning: ICC= 0.52 Role Emotional: ICC= 0.98 Mental Health: ICC= 0.57
Van Leeuwen et al. 2012	Cronbach's α of the Mental Health subscale (MHI-5) was higher than 0.70 (0.79) and all item–rest correlation were above 0.30 (range 0.37–0.68).	No data available

Lee et al. 2009	Cronbach's α for Physical Function domain: 0.83	

2. VALIDITY

Author ID	**Validity**
Forchheimer 2004	The Physical Component Score (PCS) and Mental Component Score (MCS) were not related to each other, as expected, with Pearson's r = -0.075.
King & Roberts 2002	Cuzick nonparametric test for significance of trend: SF-36 Physical Functioning was correlated to: Nurick Scale (p<0.001) Harsh Scale (p<0.001) Cooper Leg Subscale (p<0.001) SF-36 PCS was correlated to: Nurick Scale (p<0.001) Harsh Scale (p<0.001) Modified Japanese Orthopaedic Association (JOA) Scale – Leg Motor Component was correlated to: SF-36 Physical Functioning, Role Functioning (Physical), General Health Perceptions, PCS (p≤0.006) SF-36 Social Functioning (p<0.001)
Andresen 1999	Correlations (Pearson's r) between: BRFSS Question "poor physical health days" and: 8 SF-36 subscales: r = -0.220 - -0.685 (P<0.01) SF-36 physical component summary (PCS): r = -0.458 (P<0.01) SF-36 mental component summary (MCS): r = -0.600 (P<0.01) BRFSS Question "poor mental health days" and: 8 SF-36 subscales: r = -0.331 - -0.686 (P<0.01) for 7 domains, -0.167 (P<0.05) for Physical Function PCS: r = -0.234 (P<0.01) MCS: r = -0.681 (P<0.01) BRFSS Question "good days" and: 8 SF-36 subscales: r = 0.226 - 0.677 (P<0.01) PCS: r = 0.443 (P<0.01) MCS: r = 0.650 (P<0.01) BRFSS Question "pain limited activity days" and: 8 SF-36 subscales: r = -0.409 - -0.622 (P<0.01) for 7 domains, -0.167 (P>0.05) for Physical Function PCS: r = -0.354 (P<0.01) MCS: r = -0.639 (P<0.01) BRFSS Question "sad, blue, depressed" and: 8 SF-36 subscales: r = -0.210 - -0.795 (P<0.01) PCS: r = -0.458 (P<0.01) MCS: r = -0.600 (P<0.01) BRFSS Question "days worried, tense anxious" and: 8 SF-36 subscales: r = -0.371 - -0.720 (P<0.01) for 7 domains, -0.190 (P<0.05) for Physical Function PCS: r = -0.239 (P<0.01) MCS: r = -0.734 (P<0.01) BRFSS Question "days without enough sleep" and: 8 SF-36 subscales: r = -0.290 - -0.446 (P<0.01) for 6 domains, -0.088 - -0.219 (P>0.05) for 2 domains PCS: r = -0.217 (P<0.01) MCS: r = -0.427 (P<0.01) BRFSS Question "days full of energy" and: 8 SF-36 subscales: r = 0.266 - 0.789 (P<0.01) PCS: r = 0.489 (P<0.01) MCS: r = 0.610 (P<0.01) Quality of Well-Being scale (QWB) and SF-36:

	5 of 8 SF-36 subscales r=0.251 to 0.290 (P<.01), vitality r=0.164 (P<.05) SF-36 role emotional and mental health subscales not significantly correlated MCS r=0.116 (P<.05) PCS r=0.417 (P<.01) Lawton's Instrumental Activities of Daily Living (IADL) and SF-36: 7 of 8 SF-36 subscales r=-0.454 to -0.201 (P<.01), bodily pain r=-0.159 (P<.05) MCS r=-0.262 (P<.01) PCS r=-0.357 (P<.01)
Lin et al. 2007	Correlation between SF-36 and the WHOQOL-BREF: The rho of the conceptually related domains between the WHOQOL-BREF and the SF-36 (overall QoL & general health-general health; Physical Capacity-Physical Functioning/Role physical/bodily pain; Psychological well-being-social functioning/role emotional/mental health; social relationships-social functioning) are higher than 0.4, with the exception of the WHOQOL-BREF's Psychological Well-Being and the SF-36's Role Emotional (rho = 0.37) All P-values<.0001 The ability of the SF-36 to discriminate among subgroups with respect to age, education, marital status, employment, time since injury, level of injury, and self-care ability was tested using the Mann-Whitney U-test. Overall, the SF-36 domains* significantly discriminated between subgroups in terms of 2 characteristics**. *Physical Functioning, Role Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role Emotional, Mental Health **Employment status, self-care ability (all domains P≤0.05)
Miller et al. 2008	**Pearson's correlation** Correlation between SF-36 and the Centre for Epidemiologic Studies Depression Scale (CESD-20) which measures a different construct (with some overlap) than the SF-36: Mental Health: r=0.75* Emotional role function: r=0.55* Vitality: r=0.54* Pain: r=0.27* Social role function: r=0.37* Physical function: r=0.34* Physical role function: r=0.40* General health: r=0.57* **Pearson's correlation** Correlation between SF-36 and the Centre for Epidemiologic Studies Depression Scale – 10 (CESD-10) which measures a different construct (with some overlap) than the SF-36: Mental Health: r=0.71* Emotional role function: r=0.56* Vitality: r=0.60* Pain: r=0.38* Social role function: r=0.42* Physical function: r=0.37* Physical role function: r=0.49* General health: r=0.60* *P<.05 was considered significant
Raichle et al. 2006	SF-36's Psychological functioning domain correlation (Spearman's rho) with the Graded Chronic Pain (GCP) Disability Scale: GCP composite score = -0.55* Individual items: Daily activities = -0.51* Work and housework = -0.48*

	Recreation, social and family activities = -0.57* *P<0.01 All coefficients were significant and positively associated with GCP. SF-36's Psychological functioning scale correlation (Spearman's rho) with the Brief Pain Inventory (BPI) Interference Scale: BPI 7-item version = -0.62* BPI 10-item version = -0.60* BPI 12-item version = -0.61* Individual items: General activity = -0.51* Mood = -0.65* Mobility = -0.44* Normal work = -0.48* Relationship with others = -0.63* Sleep = -0.30* Enjoyment of life = -0.64* Self-care = -0.41* Recreational activities = -0.49* Social activities = -0.58* Communication = -0.64* Learning new information and skills = -0.44* *P<0.01 All coefficients are significant and negatively associated with the BPI.
Anton et al. 2008	Pearson correlation Correlation between SF-36 and the Fatigue Severity Scale which measures different constructs from the SF-36: r=-0.48
Horner-Johnson et al. 2010	In analyzing mean domain scores, people with SCI scored significantly lower than the nondisabled group on the Physical Functioning, Role–Physical, and Bodily Pain domains. Item-by-item differential item-functioning analyses showed significant negative differential item functioning in people with SCI on all 10 physical functioning items. In contrast, all vitality items showed significant positive differential functioning for people with SCI when controlling for total physical health scores. Differential item functioning of SF-36 domain items controlling for physical Z score* and demographics: Physical functioning: -0.87 to -0.29 Role-physical: -0.15 to -0.02 & 0.03 to 0.19 Bodily Pain: 0.11 to 0.14 General Health: -0.03 to -0.05 & 0.18 to 0.24 Vitality: 0.23 to 0.48 *consisted of above 5 domains Differential item functioning of SF-36 domain items controlling for mental Z score* and demographics: Vitality: 0.03 & -0.06 to -0.19 Social functioning: -0.10 to -.013 Role-emotional: 0.05 to 0.07 & -0.08 Mental Health: 0.07 to 0.39 *consisted of above 4 domains
Van Leeuwen et al. 2012	Divergent Validity – Spearman correlation of MHI-5 subscale of the SF-36 with: Functional Independence Measure: ρ=0.094 (n.s.)

	Sickness Impact Profile mobility range: ρ =-0.283 (P<0.01) Type of injury: ρ =-0.009 (n.s.) Completeness of injury: ρ =-0.008 (n.s.) Cause of injury: ρ =0.192 (P<0.05) Concurrent Validity – Spearman correlation of SF-36 general health domain with (all P<0.01): LISAT-9: ρ =0.531 Neuroticism: ρ = -0.546 SF-vitality: ρ = 0.528 SF-general health: ρ=0.367
Ataoglu et al. 2013	The following SF-36 Domains negatively correlate with BDI: General health: (r=-0.229, p=0.016) Vitality (r=-0.329, p=0.000) Social functioning (r=-0.283, p=0.003) Mental health (r=-0.247, p=0.010)
Tramonti et al. 2014	SF-36 physical functioning positively correlates with SCIM-III Spearman's ρ = 0.72 (P<0.01, 1-β=0.99)
Unalan et al. 2015	Pearson's r with Turkish SCIM-III: 0.339, p<0.005
Golhasani-Keshtan et al. 2013	Pearson's correlations: CHART Mobility & SF36 Role Physical: 0.322, p=0.020 CHART Cognitive Independence & SF36 Physical Component Summary: 0.276, p=0.047 CHART Social Integration & SF36 Vitality: -0.429, p=0.002 CHART Social Integration & SF36 Social Functioning: 0.287, p=0.039
3. RESPONSIVENESS	
Author ID	**Responsiveness**
Lin et al. 2007	Stratified random sample by current employment status of 30 subjects, selected from those who had been employed before the SCI, were interviewed for a second time to recall their health related QoL at the time of the injury. Effect Sizes comparing employed to unemployed SCI patients using SF-36 domains: Physical Functioning: 0.92 Role Physical: 0.60 Bodily Pain: 0.01 General Health: 0.00 Vitality: 0.16 Social Functioning: 0.30 Role Emotional: 0.21 Mental Health: 0.44
Lee et al. 2009	Comparing paraplegic to tetraplegic patients using the SF-36: Effect Sizes: Physical Functioning domain: 1.09 Physical Component Summary: 0.36 Mental Component Summary: -0.16 SRM (mean change, s.d.) for paraplegia patients: Physical Functioning domain: 0.77 (9.26,12.07) Physical Component Summary: 0.62 (5.52, 8.98)

	Mental Component Summary: 0.87 (10.25, 11.83) SRM (mean change, s.d.) for tetraplegia patients: Physical Functioning domain: 0.11 (1.62, 14.34) Physical Component Summary: 0.55 (4.76, 8.67) Mental Component Summary: 0.62 (9.21, 14.97) Overall SRM (mean change, s.d.): Physical Functioning domain: 0.36 (5.00, 13.87) Physical Component Summary: 0.58 (5.10, 8.78) Mental Component Summary: 0.71 (9.67, 13.67)
4. FLOOR/CEILING EFFECT	
King & Roberts 2002	Percentage of patients achieving minimal score: All 8 domains: 0% Physical component summary (PCS): 13.7% Mental component summary (MCS): 14.9% Percentage of patients achieving maximal score: 7 of 8 domains: 100% Vitality domain: 80% Physical component summary (PCS): 50.7% Mental component summary (MCS): 72.5%
Andresen 1999	Problems with scaling with extremes with 20% of subjects or more received maximum (ceiling) or minimum (floor) values. 3 subscales (role physical, social functioning, role emotion) exhibited ceiling effects between 22.5 and 75.3% 2 subscales (physical functioning and role physical) exhibited floor effects 24.2% and 36.3%, respectively.
Lin et al. 2007	Floor Effect: number of items in domain & percentage of patients achieving minimal score: Physical Functioning: 10 (12.2%) Role Physical: 4 (28.1%) Bodily Pain: 2 (0.9%) General Health: 5 (0.9%) Vitality: 4 (0.4%) Social Functioning: 2 (2.2%) Role Emotional: 3 (20.1%) Mental Health: 5 (0.4%) Ceiling Effect: number of items in domain & percentage of patients achieving maximal score: Physical Functioning: 10 (29.7%) Role Physical: 4 (54.4%) Bodily Pain: 2 (0.9%) General Health: 5 (0.4%) Vitality: 4 (0.4%) Social Functioning: 2 (10.9%) Role Emotional: 3 (63.8%) Mental Health: 5 (0.4%)
van Leeuwen et al. 2012	For the mental health domain of the SF-36 (a.k.a. Mental Health Index – 5, MHI-5), no participants scored 0 and 4.8% of the participants scored 100, indicating no floor or ceiling effects.
Lee et al. 2009	Floor effect in physical functioning domain: Patients who chose rating of 1 for all of domain items (3a-3j): 29% Individual items: Walking more than a mile (3g): 96% Walking several hundred yards (3h): 94% Walking one hundred yards (3i): 93%
5. INTERPRETABILITY	
Author ID	**Interpretability**

Lin et al. 2007

SF-36 scores, and clinically relevant values (SEM and MDC calculated from data in Lin et al. 2007):
N=187, 330 male, mean age 50.3

SF-36 Subscales:	Mean (SD) score:	SEM	MDC
Physical functioning	61.2 (39.8)	21.4	59.4
Role physical	62.7 (44.4)	14.7	40.8
Bodily pain	67.5 (20.6)	7.4	20.6
General health	52.5 (20.3)	7.9	21.8
Vitality	57.0 (17.3)	4.6	12.7
Social functioning	71.8 (22.2)	5.9	16.3
Role emotional	71.8 (40.9)	4.1	11.3
Mental health	63.5 (15.5)	7.4	20.6

Forchheimer et al. 2004

SF-36 norm-based scale and component scores
N=215, 78.5% male, mean age 38.8±14.5

SF-36 Subscales:	Mean (SD) score:
Physical functioning	26.6 (11.5)
Role physical	40.7 (10.9)
Bodily pain	42.2 (12.4)
General health	44.4 (11.8)
Vitality	46.8 (9.6)
Social functioning	43.0 (13.3)
Role emotional	49.0 (10.6)
Mental health	48.3 (11.0)
Physical component summary	33.5 (10.1)
Mental component summary	53.5 (11.6)

King & Roberts 2002

N=88, 88% male, mean age 56.8±11.2

SF-36 Subscales:	Mean (SD) score:
Physical functioning	31.9 (234.6)
Role physical	14.8 (27.5)
Bodily pain	29.4 (22.1)
General health	40.0 (21.2)
Vitality	30.3 (20.2)
Social functioning	42.8 (25.8)
Role emotional	38.6 (41.9)
Mental health	54.9 (24.7)
Physical component summary	27.8 (8.3)
Mental component summary	40.5 (12.9)

Andresen et al. 1999

N=183, mean age 50.5, 82 self-reported quadriplegia

SF-36 Subscales:	Mean (SD) score:
Physical functioning	21.2 (25.14)
Role physical	41.5 (40.14)
Bodily pain	49.4 (31.41)
General health	55.2 (26.11)
Vitality	52.9 (25.19)
Social functioning	66.9 (32.20)
Role emotional	81.5 (34.95)
Mental health	73.6 (22.00)
Physical component summary	28.7 (10.26)
Mental component summary	55.9 (12.36)
SF-12 Physical health summary	34.5 (8.31)

<table>
<tr><td></td><td><table><tr><td>SF-12 Mental health summary</td><td>49.4 (12.63)</td></tr></table></td><td></td></tr>
<tr><td>Horner-Johnson et al. 2010</td><td>N=206 (54 SCI only, 34 male, mean age 46.31±10.7)<table><tr><th>SF-36 Subscales:</th><th>Mean (SD) score:</th></tr><tr><td>Physical functioning</td><td>23.68 (11.98)</td></tr><tr><td>Role physical</td><td>38.67 (11.55)</td></tr><tr><td>Bodily pain</td><td>42.40 (11.22)</td></tr><tr><td>General health</td><td>47.71 (8.97)</td></tr><tr><td>Vitality</td><td>48.14 (11.74)</td></tr><tr><td>Social functioning</td><td>44.12 (11.85)</td></tr><tr><td>Role emotional</td><td>45.30 (11.41)</td></tr><tr><td>Mental health</td><td>50.27 (9.35)</td></tr></table></td><td></td></tr>
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