

The assessment of depression in people with multiple sclerosis : a systematic review of psychometric validation studies

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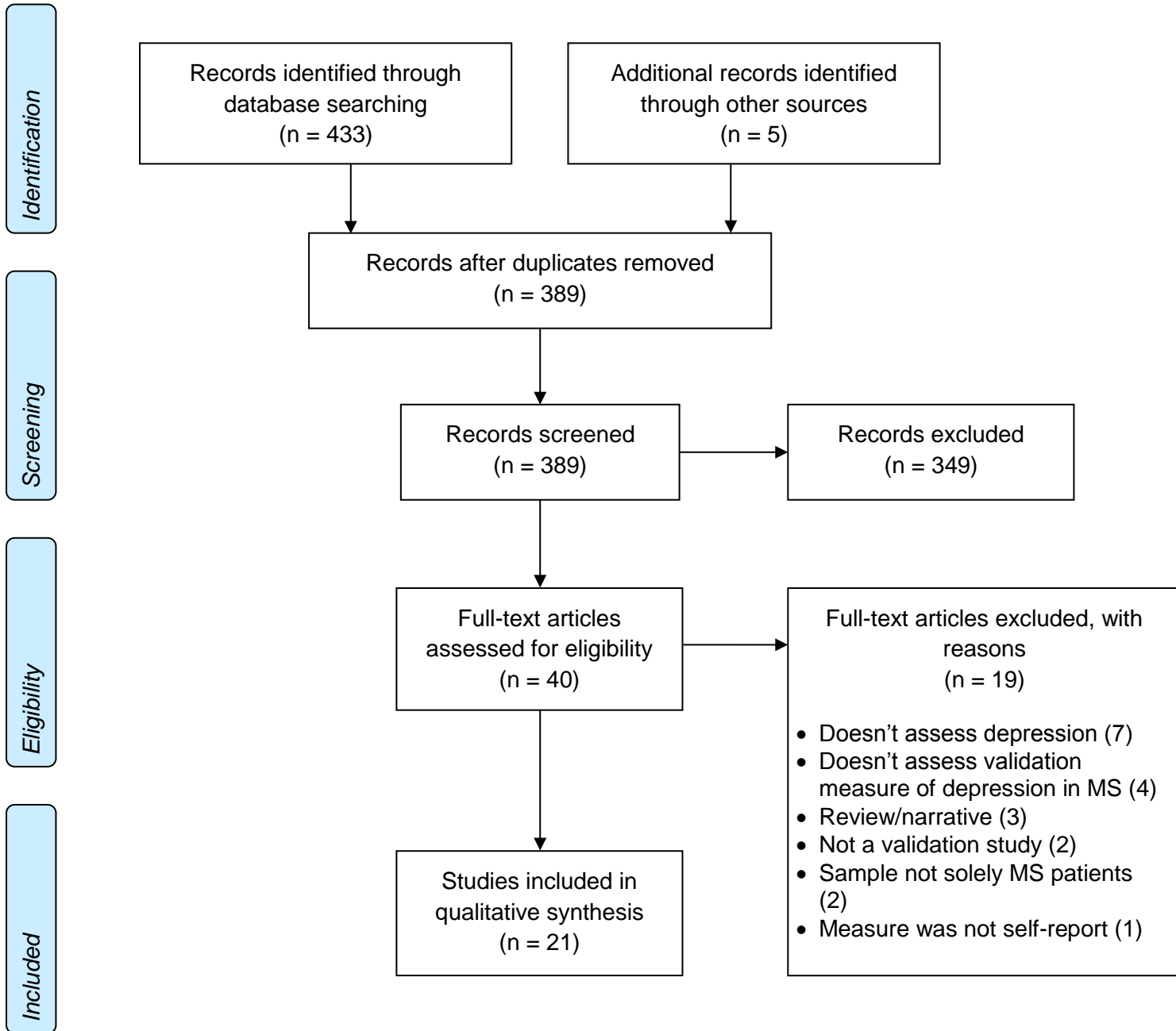
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Appendix A.

Figure 1: Flow Diagram of Study Selection



Appendix B.

Studies Excluded at Full Text Screening, With Reasons

Authors (Date)	Reason for Exclusion
Quaranta et al. (2012)[1]	Measure was not self-report
Knox (2010)[2]	
Manoj & Sivan (2007)[3]	Review/narrative
Nocentini (2006)[4]	
Doward et al. (2009)[5]	
Fishman et al. (2004)[6]	
Groom et al. (2003)[7]	
McGuigan & Hutchinson (2004)[8]	Doesn't assess depression
Mueller & Girace (1988)[9]	
O'Brien et al. (2007)[10]	
Schwartz et al. (2011)[11]	
Cook et al. (2012)[12]	
Gold et al. (2003)[13]	
Horton et al. (2010)[14]	Doesn't assess validation of depression measure in MS
Provinciali et al. (1999)[15]	
Alajbegovic et al. (2009)[16]	
Good et al. (1992)[17]	Not a validation study
Leon et al. (2001)[18]	Sample not solely PwMS
Lykouras et al. (1998)[19]	

Appendix C.

Study Characteristics

Authors (Date), Country	Samples	Baseline Characteristics	MS Diagnosis (years)	Disability Status	Recruitment Method	Measures	Validity/ Reliability Tested
Aikens et al. (1999)[20], USA	MS=105, Depressed=34, Healthy=80, Diabetes=71, Chronic pain=80	MS: $M_{age}=41.9(SD= 9.0)$, 63% female; Depressed: $M_{age}=39.3 (SD=14.6)$, 65% female; Healthy controls: M age $M_{age}=34.4 (SD=8.3)$, 50% female; Diabetes: $M_{age}=55.9$ ($SD=16.7$), 56% female; Chronic pain: $M_{age}=45.0$ ($SD=13.9$), 56% female	$M = 11$ years	Expanded Disability Status Scale = 0.0 - 7.5 (Median = 3.8) Moderate Disability	University Hospital	BDI-II	Construct validity; content validity; internal reliability (cronbach's alpha)
Amtmann et al. (2014)[21], USA	MS = 455	$M_{age}=52.9 (SD=10.8)$; 83% female ($N=377$) and 17% male ($N=78$);	$M = 14.5 (SD = 10)$	Moderate level	University Hospital/ National Multiple Sclerosis Society charter	CESD-10, PHQ-9 PROMIS- D-8	Evaluation of dimensionality; inter- item correlation; discriminant/convergent validity

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Authors (Date), Country	Samples	Baseline Characteristics	MS Diagnosis (years)	Disability Status	Recruitment Method	Measures	Validity/ Reliability Tested
Avasarala et al. (2003)[22], USA	MS=120	Ages: 20-29 <i>N</i> =6, 30-39 <i>N</i> =25, 40-49 <i>N</i> =53, 50-59 <i>N</i> =32, 60-69 <i>N</i> =4; 71% female	NA	NA	University Hospital	YSQ	Criterion validity
Beeney and Arnett (2008)[23], USA	3 year follow-up MS=52; cross- sectional analysis, MS=96.	<i>N</i> =52: $M_{age}=46.57$ ($SD=7.61$); <i>N</i> =96: $M_{age}=47.41$ ($SD=8.98$).	<i>M</i> (T1) =14.04 ($SD = 9.37$); <i>M</i> (T2) = 16.87 ($SD = 9.24$)	EDSS (T1) =4.55 ($SD = 1.44$) EDSS (T2) = 4.71 ($SD = 1.61$)	University Hospital/ National Multiple Sclerosis Society charter	CMDI	Construct validity
Benedict et al. (2003)[24], USA	MS=54	$M_{age}=42.8$ ($SD=9.7$), 79% female	NA	EDSS median = 2.5 ($R = 0.0 - 7.0$)	University Hospital	BDI-FS	Criterion and construct validity

Depression assessment in multiple sclerosis

Authors (Date), Country	Samples	Baseline Characteristics	MS Diagnosis (years)	Disability Status	Recruitment Method	Measures	Validity/ Reliability Tested
Chang et al. (2003)[25], USA	MS=433; plus 'standardisation sample' $n=420$	MS: $M_{age}=45.0$ ($SD=10.0$), 69.4% female; Standardisation sample described in Nyenhuis et al. (1998)[26]: $M_{age}=43.1$	NA	NA	University Hospital	CMDI	Content validity, internal reliability, construct validity
Honarmand and Feinstein (2009)[27], Canada	Study 1: MS=140; Study 2: MS=40, MD=21, Matched controls (no MD) = 19	$M_{age}=44.6$ ($SD=10.3$), 75% female	$M = 8.8$ ($SD =$ 6.8)	EDSS = 4.0 ($SD =$ 2.34)	Hospital	HADS	Criterion validity
Mohr et al. (1997)[28], USA	MS =184, DEP =72, controls (college students) = 555	MS: $M_{age}=44.0$, 68% female; DEP: $M_{age}=47.5$, 51% female; Controls: $M_{age}=20.2$, 55%	NA	NA	University Hospital	BDI	Face validity

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Authors (Date), Country	Samples	Baseline Characteristics	MS Diagnosis (years)	Disability Status	Recruitment Method	Measures	Validity/ Reliability Tested
Mohr et al. (2007)[29], USA	MS = 260	$M_{age}=51$ ($SD=10.5$), 73% female	$M = 19$ ($SD =$ 10.5)	NA	University Hospital	Two-item measure	Criterion validity, construct validity
Moran and Mohr (2005)[30], USA	MS (with depression)=42	$M_{age}=43.0$ ($SD=10.3$), 69% female	$M = 6.6$ ($SD =$ 6.1)	NA	University Hospital/ referrals/ National Multiple Sclerosis Society Charter	BDI	Construct validity
Nicholl et al. (2001)[31], UK	MS=88	$M_{age}=48.97$ ($SD=8.9$), 75% female	$M = 11.8$ ($SD =$ 7.5)	NA	Hospital/Rehabilitation ward	HADS	Criterion validity, construct validity
Nyenhuis et al. (1995)[32], USA	MS=84, DEP=101, controls (MS matched)=87	MS: $M_{age}=49.3$ ($SD=11.1$), 75% female; DEP: $M_{age}=50.5$ ($SD=10.7$), 65% female; Controls: $M_{age}=49.6$ ($SD=11.6$), 75% female	NA	EDSS = 4.74 (SD = 3.6)	Community based	BDI, MDI	Construct validity

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Authors (Date), Country	Samples	Baseline Characteristics	MS Diagnosis (years)	Disability Status	Recruitment Method	Measures	Validity/ Reliability Tested
Pandya et al. (2005)[33], Canada	MS=47	$M_{age}=39.3$ (range 18-56), 72.3% female	NA	EDSS = 3.0	University hospital/referrals to Psychiatric care	CES-D	Criterion validity, construct validity
Patten et al. (2005)[34], Canada	MS=567	$M_{age}=48$ (Range 19-76), 75.7% female	NA	NA	University Hospital	CES-D	Construct validity
Patten et al. (2010)[35], Canada	year 0 $N=1670$ year 1; $N=1336$ year 2; $N=648$, year 3 $N=186$	15.9% aged 18-34, 29.5% aged 35-44, 33.6% aged 45- 54, 21.0% aged 55+; 77.1% female	NA	EDSS (mode) = 4 ($R = 4-8$)	University Hospital	CES-D	Test-retest reliability
Sjonnesen et al. (2012)[36], Canada	MS=173, Controls (general population)=3304	MS: $M_{age}=52.9$ (95%CI 51.2- 54.6), 74.6% female; Controls: $M_{age}=44.4$ (95%CI 44.0-44.8), 67.7% female	$M = 14.4$ (95%CI = 13- 15.8)	27.1% (46/170) unable to work	Patient Registry/ Hospital	PHQ-9	Content validity, construct validity, internal reliability

Depression assessment in multiple sclerosis

Authors (Date), Country	Samples	Baseline Characteristics	MS Diagnosis (years)	Disability Status	Recruitment Method	Measures	Validity/ Reliability Tested
Solari et al. (2003)[37], Italy	MS=213, Healthy controls (matched to MS)=213, DEP=32	MS: $M_{age}=38$ ($SD=9.2$), 66% female; DEP: $M_{age}=51.8$ ($SD=14.15$), 78% female; Healthy controls: $M_{age}=38.3$ ($SD=9.4$), 55.9% female.	$M = 9.1$ ($SD =$ 6.9)	EDSS = 2.9 ($SD =$ 1.6)	University Hospital	CMDI	Internal reliability, test- retest reliability, content validity, construct validity, criterion validity
Strober and Arnett (2010)[38], USA	MS-DEP=17, MS-NON- DEP=67, healthy controls=22	MS-DEP: $M_{age}=45.24$ ($SD=8.39$), 82% female; MS- NON: $M_{age}=47.93$ ($SD=9.30$), 84% female; Controls: $M_{age}=46.18$ ($SD=13.36$), 82% female.	M depressed - 10.59 ($SD =$ 6.42) M MS-NON = 11.15 ($SD =$ 8.66)	EDSS depressed = 5.18 ($SD = 1.5$) EDSS MS- NON= 4.32 ($SD =$ 1.54)	National Multiple Sclerosis Society charter	mBDI	Construct validity
Sullivan et al. (1995)[39], Canada	MS=46	$M_{age}=34.4$, 78% female	NA	NA	Hospital/ referrals	BDI	Criterion validity, construct validity

Depression assessment in multiple sclerosis

Authors (Date), Country	Samples	Baseline Characteristics	MS Diagnosis (years)	Disability Status	Recruitment Method	Measures	Validity/ Reliability Tested
Vahter et al. (2007)[40], Estonia (from Manoj and Sivan, 2007[3])	MS=134	$M_{age}=43.8$ ($SD=12.4$), 73.9% female	$M = 9.9$ ($SD =$ 8.5)	EDSS = 5.8 ($SD =$ 2.5)	Hospital	One-item measure	Criterion validity
Verdier- Taillefer et al. (2001)[41], France	MS=857, GP patients=1598, healthy workers=403	MS: $M_{age}=47.0$ ($SD=7.2$), 63.2% female; GP patients: $M_{age}=44.6$ ($SD=8.8$), 59.1% female; Healthy workers: $M_{age}=42.9$ ($SD=6.3$), 55.3% female	NA	NA		CES-D	Content validity, internal reliability, construct validity

Note: MS=Multiple Sclerosis, MD=Major Depression, DEP=Depressed, NA = Not Available