Supplementary table 1. Studies on MS QoL in the MENA

Authors	Country	Date	Study Design	Sample	Sample Size	Intervention	Outcomes	Main tools used	Tool Language	Translation process	Validity and reliability
Abdullah & Badr	Kuwait	2018	Cross-sectional	MS patients	200	None	QoL	Satisfaction with Daily Occupation scale, MSQOL-54	Arabic	Not applicable	Established in another study
Abolghasemi et al.	Iran	2016	Randomized Controlled clinical trial	MS patients	32 (16 in each group)	Supportive-expressive therapy (versus no intervention)	Hope and QoL	Hope Inventory, WHOQOL-Bref	Persian	Not applicable	Established in another study
Afkar et al.	Iran	2017	Systematic review and meta-analysis	MS patients	Not Applicable	Exercise therapy	QoL	Various; MSQOL-54, SF-36, SF-8, WHOQOL-Bref, Functional Assessment of Multiple Sclerosis (version 2)	Not applicable	Not applicable	Not applicable
Algahtani et al.	Saudi Arabia	2017	Cross-sectional	MS patients	292	None	QoL	EuroQOL-5 Dimensions	Arabic	Not applicable	Established in another study
Alsaadi et al.	United Arab Emirates	2017	Cross-sectional	MS patients	80	None	QoL	WHOQOL–Bref, Patient Health Questionnaire Depression Scale-9, Generalized Anxiety Disorder Scale-7, EDSS	Not mentioned for WHOQOL-Bref	Not applicable	Not mentioned
Alshubaili et al.	Kuwait	2008	Cross-sectional	RRMS and PPMS patients, family caregivers, and healthy (other) volunteers	170	None	QoL	Caregiver impression of patients QOL, caregiver attitudes to patients illness, BDI, EDSS, WHOQOL-Bref, MSQOL-54	Arabic	Forward backward translation	α values of MSQOL-54 ranged between 0.73 and 0.96
Alshubaili et al.	Kuwait	2007	Cross-sectional	RRMS and PPMS patients, family caregivers, and healthy (other) volunteers	170	None	QoL	Caregiver attitudes' questionnaire, WHOQOL–Bref, BDI, EDSS	Arabic	Back – translation	α values of WHOQOL-Bref was 0.94
Al-Tahan et al.	MENA; Middle East	2011	Advisory group recommendations	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

	MS Advisory Group										
Ashtari et al.	Iran	2016	Double-blind randomized clinical trial	RRMS patients	94 (47 in each group)	High dose vitamin D (versus placebo)	QoL	MSQOL-54	Persian	Not applicable	Established in another study
Ayatollahi et al.	Iran	2007	Cross-sectional	RRMS, SPMS, and PPMS patients	106	None	QoL	Multiple Sclerosis Impact Scale (MSIS-29), BDI	Persian	Not applicable	Established in another study
Effat et al.	Egypt	2016	Cross-sectional	RRMS patients and healthy volunteers	60 MS, 30 matched controls	None	QoL	BDI, Multiple Sclerosis Quality of Life Inventory, SF-36	Arabic	Not applicable	Established in another study
Ghafari et al.	Iran	2009	Quasi-experimental study	MS patients	66 (33 in each group)	Progressive Muscle Relaxation Technique	QoL	Self-reported checklist on exercise or relaxation activity, SF-8 Health Survey	Not mentioned	Not applicable	Not mentioned
Ghajarzadeh et al.	Iran	2016	Cross-sectional (validation study)	RRMS patients, 2 groups; relapse and no relapse	211	None	Intraclass correlation coefficient (ICC) and Cronbach's alpha (α)	PERSEPP, MSQOL, SF-36	Persian	Forward backward translation	PERSEPP: ICC and α > 0.8
Hadianfard et al.	Iran	2015	Cross-sectional	MS patients (16 years and above)	100	None	QoL	SF-36, Morisky Medication Adherence Scale, Connor-Davidson Resilience Scale	Persian	Not applicable	Established in another study
Hamdan et al.	Lebanon	2012	Cross-sectional	MS patients and healthy volunteers	59 MS and 28 healthy controls	None	Presence/absence of phonatory symptoms, disease duration, EDSS, fatigue and depression severity	FSS, Hamilton Rating Scale for Depression, Voice Handicap Index	Not mentioned	Not mentioned	Good for original language
HamidReza et al.	Iran	2013	Quasi-experimental	MS patients	34	Health belief based intervention model	QoL	SF-36	Persian	Not applicable	Established in another study
Hatam, Bastani, & Shahtaheri	Iran	2016	Cross-sectional	RRMS patients (18 years to 70)	100 (50 in each group)	Patients already taking Avonex or Cinnovex	QoL	MSQOL-54, EDSS	Persian	Not applicable	Established in another study
Helmy et al.	Egypt	2014	Cross-sectional	MS patients	30	None	Depression and QoL	Beck Depression Inventory (BDI), SF-36	SF 36: Arabic, others not mentioned	For SF-36: forward backward translation	Not mentioned
Kamran et al.	Iran	2015	Cross-sectional	MS patients and healthy volunteers	66	None	Fatigue, QoL, mobility and physical activity	Guy's Neurological Disability Scale, Modified Rivermead	Persian	Not applicable	Established in another study

								Mobility Index, MFIS, MSQOL-54			
Kargarfard et al.	Iran	2012	Cross-sectional	MS patients	281	None	QoL	MSQOL-54, MFIS, BDI, Multiple Sclerosis Impact Scale	Persian	Not applicable	Established in another study
Mokhber et al.	Iran	2015	Single-blind, three-arm randomized clinical trial	Newly diagnozed RRMS patients receiving DMT	90	DMT: Avonex, Rebif, Betaferon	QoL	MSQOL-54, SF-36	Farsi	Not applicable	Established in another study
Najafi et al.	Iran	2014	Retrospective chart review study	RRMS patients already using Avonex or Cinnovex	140 (70 in each group)	Avonex or Cinnovex	Cost effectiveness of treatment, QoL	MSQOL-54	Not mentioned	Not mentioned	Not mentioned
Nikfallah et al.	Iran	2015	Cross-sectional (validation study)	MS or Spinal Cord Injury (SCI) patients	80 SCI, 74 MS	None	Cronbach's α, convergent and discriminant validities	Qualiveen-30, ICIQ-UI SF, SF-12	Persian	Multi-stage forward-backward-translation procedure	α ranged from 0.82 to 0.95. Good convergent and high discriminative power
Pakdaman et al.	Iran	2017	Clinical trial	RRMS patients	383	IFB	QoL	MusiQoL, SF-36	Not mentioned	Not applicable	Not mentioned
Pormenati et al.	Iran	2013	Quasi-experimental	Male MS patients	60 (30 in each group)	Selective aerobic training (versus no intervention)	QoL	SF-8	Persian	Not applicable	Established in another study
Qaderi & Merghati Khoei	Iran	2013	Cross-sectional	Married females with MS	132	None	Perceived sexual activity and satisfaction, QoL	Multiple Sclerosis Intimacy and Sexuality Questionnaire-19, MSQOL-54	Not mentioned	Not applicable	Established in another study
Rafii et al.	Iran	2018	Quasi-experimental	MS patients with urinary incontinence	50	Pelvic floor muscle exercises	Urinary incontinence, QoL	International Consultation on Incontinence Questionnaire-Urinary Incontinence-Short Form, Qualiveeb-30	Persian	Not applicable	Established in another study
Rahnema et al. (information extracted from abstract)	Iran	2016	Cross-sectional	MS patients and their caregivers	190	None	Caregiver attitudes, QoL	WHOQOL–Bref, BDI, EDSS	Arabic	Not applicable	Full content is inaccessible

Rezapour et al.	Iran	2017	Cross-sectional	MS patients	171	None	QoL	EDSS, MSQOL-54	Persian	Not applicable	Established in another study
Rimaz et al.	Iran	2014	Cross-sectional	MS patients (15 years to 65)	172	None	QoL	World Bank's Social Capital Integrated Questionnaire, MSQOL-54	Persian	Not mentioned	Established in another study
Salehi, Shakhi, &Khiavi	Iran	2016	Cross-sectional	MS patients with EDSS ≤ 6	101	None	QoL	World Health Organization Disability Assessment Schedule 2.0, MSQOL-54	Persian	Not applicable	Established in another study
Sarraf et al.	Iran	2014	Cross-sectional	MS patients	114	None	Sleep quality, QoL	Pittsburgh Sleep Quality Index, MSQOL-54	Persian	Not applicable	Established in another study
Sharifi et al.	Iran	2012	Quasi-experimental	MS patients	53	Self-care education	QoL	MSQOL-54	Persian	Not applicable	Established in another study
Taghipour et al.	Iran	2018	Cross-sectional (validation study)	MS patients	197	None	ICC, Spearman's correlation coefficients (rho)	COOP/WONCA Charts, SF-36, EDSS	Persian	Three stage standardized protocol	COOP/WONCA Charts and SF-36 rho ranged between −0.51 and −0.75. Most COOP/WONCA ICC were >0.7
Taheri et al.	Iran	2016	Cohort	MS patients (assessed at time 1, and after 4-6 weeks (time 2))	265	Physiotherapy	Participation restriction, QoL	EDSS, MSQOL, Community Integration Questionnaire	Persian	Not applicable	Established in another study
Yamout et al.	Lebanon and Syria	2013	Cohort	MS patients (followed up for 6 months)	201	None	QoL	Brief Pain Inventory, Hamilton Depression Rating Scale, FSS, MSQOL-54	Arabic	Not applicable	Established in another study

Supplementary table 2. Pearson's product moment correlations between socio-demographic characteristics, clinical characteristics, MusiQoL and MFIS scores

	1	2	3	4	**5**	5.1	5.2	5.3	**6**	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9
1. AGE																		
2. EDSS	0.3**																	
3. Disease Duration	0.4**	0.4**																
4. Current DMT Duration	0.1*	0.0	0.3**															
5. **MFIS Total**	0.1	0.6**	0.2*	- 0.1														
5.1 Physical	0.2	0.6**	0.3*	- 0.1	0.9**													
5.2 Cognitive	0.0	0.4**	0.1	- 0.2	0.8**	0.6**												
5.3 Psychosocial	0.2	0.7**	0.2*	0.0	0.8**	0.8**	0.5**											
6. **MusiQoL Index**	**- 0.1****	**- 0.4****	- 0.2**	0.0	- 0.5**	**- 0.5****	**- 0.5****	**- 0.5****										
6.1 Activities of Daily Living	- 0.2**	**- 0.7****	- 0.3**	0.1	- 0.6**	**- 0.7****	**- 0.5****	**- 0.6****	0.6**									
6.2 Psychological Wellbeing	0.0	- 0.2**	0.0	0.1	- 0.5**	**- 0.6****	**- 0.4****	**-0.5****	0.7**	0.5**								
6.3 Symptoms	0.0	- 0.2**	- 0.1	0.1	- 0.6**	**- 0.5****	**- 0.6****	**- 0.4****	0.5**	0.4**	0.5**							
6.4 Relationships with Friends	0.0	- 0.1	- 0.1	0.0	0.1	0.1	0.0	0.0	0.4**	0.0	0.0	0.1						
6.5 Relationship with Family	0.0	- 0.1	- 0.1	0.0	0.1	0.2	0.1	0.1	0.5**	0.0	0.1	0.0	0.5**					
6.6 Sentimental and Sexual Life	- 0.1	- 0.2**	- 0.1**	0.1	- 0.2	- 0.2	- 0.2	- 0.2	0.6**	0.2**	0.3**	0.2**	0.2**	0.4**				
6.7 Coping	-0.1	- 0.1**	- 0.1	0.0	- 0.2	**- 0.3***	- 0.1	**- 0.2***	0.6**	0.3**	0.4**	0.2**	0.0	0.0	0.2**			
6.8 Rejection	- 0.1**	**- 0.4****	**- 0.2****	0.0	- 0.5**	**- 0.5****	**- 0.3****	**- 0.5****	0.7**	0.5**	0.5**	0.3**	0.1*	0.1	0.2**	0.4**		
6.9 Relationship with Health Care System	- 0.01	- 0.1**	0.0	0.0	0.0	0.0	0.1	-0.1	0.5**	0.2**	0.2**	0.2**	0.2**	0.3**	0.2**	0.2**	0.2**	

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Clinically significant results are marked in bold.

Supplementary table 3. Tukey Post-Hoc Analysis of the differences in MusiQoL scores between MS patients

Dependent Variable			**Mean Difference**	**SEM**	**Sig.**	**95% (CI)**	
						Lower Limit	**Upper Limit**
MusiQoL Index	PPMS	SPMS	6.2	4.0	0.395	-4.0	16.4
		RRMS	-5.8	3.4	0.304	-14.5	2.8
		CIS	-11.1	4.2	0.043	-22.0	-0.3
	SPMS	RRMS	-12.1	2.3	**<0.001**	-18.1	-6.1
		CIS	-17.3	3.5	**<0.001**	-26.3	-8.4
	RRMS	CIS	-5.3	2.8	0.22	-12.4	1.8
MusiQoL Dimensions							
1. Activities of Daily Living	PPMS	SPMS	10.5	6.2	0.334	-5.6	26.6
		RRMS	-25.4	5.4	**<0.001**	-39.3	-11.4
		CIS	-32.8	6.7	**<0.001**	-50.0	-15.5
	SPMS	RRMS	-35.9	3.5	**<0.001**	-44.9	-26.8
		CIS	-43.3	5.3	**<0.001**	-56.9	-29.6

	RRMS	CIS	-7.4	4.3	0.304	-18.4	3.6
2. Psychological Wellbeing	PPMS	SPMS	4.9	6.5	0.874	-11.9	21.8
		RRMS	-8.3	5.7	0.46	-22.8	6.3
		CIS	-10.0	7.0	0.482	-28.1	8.1
	SPMS	RRMS	-13.2	3.7	0.002	-22.7	-3.8
		CIS	-15.0	5.5	0.036	-29.2	-0.7
	RRMS	CIS	-1.7	4.5	0.98	-13.2	9.7
8. Rejection	PPMS	SPMS	4.4	7.0	0.922	-13.7	22.5
		RRMS	-20.8	6.0	0.003	-36.3	-5.4
		CIS	-29.2	7.5	0.001	-48.5	-9.9
	SPMS	RRMS	-25.3	4.1	**<0.001**	-35.7	-14.8
		CIS	-33.6	6.0	**<0.001**	-49.2	-18.1
	RRMS	CIS	-8.4	4.8	0.3	-20.7	4.0

Clinically significant results are marked in bold.

Supplementary table 4. Multiple comparisons of MusiQoL significant scores based on previous medication count

Dependent Variable			Mean Difference (I-J)	SE	Sig.	95% CI	
						LB	UB
Index	None	1 Medication	2.9	1.6	0.450	-1.6	7.4
		2 Medications	7.1	2.2	0.020	0.7	13.4
		3 Medications	9.9	3.5	0.057	-0.2	20.0
		4 Medications	4.2	4.2	0.916	-7.7	16.1
		5 Medications	15.2	8.8	0.516	-10.0	40.4
	1 Medication	None	-2.9	1.6	0.450	-7.4	1.6
		2 Medications	4.2	2.4	0.480	-2.6	11.0
		3 Medications	7.1	3.6	0.373	-3.3	17.4
		4 Medications	1.3	4.2	1.000	-10.8	13.5
		5 Medications	12.4	8.9	0.730	-13	37.7
	2 Medications	None	-7.1	2.2	0.020	-13.4	-0.7
		1 Medication	-4.2	2.4	0.480	-11.0	2.6
		3 Medications	2.8	3.9	0.979	-8.4	14.1
		4 Medications	-2.9	4.5	0.988	-15.8	10.1
		5 Medications	8.1	9.0	0.945	-17.6	33.9
	3 Medications	None	-9.9	3.5	0.057	-20.0	0.2
		1 Medication	-7.1	3.6	0.373	-17.4	3.3
		2 Medications	-2.8	3.9	0.979	-14.1	8.4
		4 Medications	-5.7	5.3	0.888	-20.9	9.4
		5 Medications	5.3	9.4	0.993	-21.6	32.2
	4 Medications	None	-4.2	4.2	0.916	-16.1	7.7
		1 Medication	-1.3	4.2	1.000	-13.5	10.8

		2 Medications	2.9	4.5	0.988	-10.1	15.8
		3 Medications	5.7	5.3	0.888	-9.4	20.9
		5 Medications	11.0	9.7	0.864	-16.6	38.7
	5 Medications	None	-15.2	8.8	0.516	-40.4	10.0
		1 Medication	-12.4	8.9	0.730	-37.7	13.0
		2 Medications	-8.1	9.0	0.945	-33.9	17.6
		3 Medications	-5.3	9.4	0.993	-32.2	21.6
		4 Medications	-11.0	9.7	0.864	-38.7	16.6

Supplementary table 5. The MusiQoL and MFIS confirmatory factor analyses indices values and reliability coefficients

Confirmatory Factor Analysis			
Fit Summary		**MusiQoL**	**MFIS**
Modeling Information	Number of Observations	663	101
	Number of Variables	31	21
	Number of Moments	496	231
	Number of Parameters	98	45
	Number of Active Constraints	0.0	0.0
	Baseline Model Function Value	18.3231	20.2214
	Baseline Model Chi-Square	12129.908	2022.1393
	Baseline Model Chi-Square DF	465	210
	Pr > Baseline Model Chi-Square	<0.0001	<0.0001
Absolute Index	Fit Function	1.8984	3.4874
	Chi-Square	1256.7688	348.7406
	Chi-Square DF	398	186
	Pr > Chi-Square	<0.0001	<0.0001
	Z-Test of Wilson & Hilferty	19.7911	6.7782
	Hoelter Critical N	235	63
	Root Mean Square Residual (RMR)	0.0831	0.0977

	Standardized RMR (SRMR)	0.0551	0.0658
	Goodness of Fit Index (GFI)	0.8822	0.7537
Parsimony Index	Adjusted GFI (AGFI)	0.8532	0.6941
	Parsimonious GFI	0.7551	0.6676
	RMSEA Estimate	0.0571	0.0935
	RMSEA Lower 90% Confidence Limit	0.0536	0.0783
	RMSEA Upper 90% Confidence Limit	0.0607	0.1086
	Probability of Close Fit	0.0005	<0.0001
	ECVI Estimate	2.2096	4.6413
	ECVI Lower 90% Confidence Limit	2.0507	4.1277
	ECVI Upper 90% Confidence Limit	2.3805	5.2574
	Akaike Information Criterion	1452.7688	438.7406
	Bozdogan CAIC	1991.4527	601.4211
	Schwarz Bayesian Criterion	1893.4527	556.4211
	McDonald Centrality	0.5233	0.4468
Incremental Index	Bentler Comparative Fit Index	0.9264	0.9102
	Bentler-Bonett NFI	0.8964	0.8275
	Bentler-Bonett Non-normed Index	0.914	0.8986
	Bollen Normed Index Rho1	0.8789	0.8053
	Bollen Non-normed Index Delta2	0.9268	0.9114
	James et al. Parsimonious NFI	0.7672	0.733
Reliability Coefficients (Cronbach's Alpha)			
	Scale	**Cronbach Alpha**	
	MusiQoL Index	0.91	
	MusiQoL dimensions		
	Activities of daily living	0.94	
	Psychological wellbeing	0.88	
	Symptoms	0.71	
	Relationships with friends	0.85	
	Relationships with family	0.89	
	Sentimental and sexual life	0.79	

	Coping	0.76
	Rejection	0.86
	Relationship with healthcare system	0.86
	MFIS Total	0.96
	MFIS subscales	
	Physical	0.95
	Cognitive	0.94
	Psychosocial	0.89