Use of the SS Scale, FIQR, and FIQ VASs for assessment of symptom severity in Egyptian fibromyalgia patients

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Background
Fibromyalgia (FM) is a complex syndrome associated with significant impairment in the quality of life and function. The ability to evaluate and measure the severity of FM is likely to provide several benefits.

Objective
This study aimed to assess symptom severity in Egyptian FM patients using the Symptom Severity Scale (SS Scale), Revised Fibromyalgia Impact Questionnaire (FIQR), and Fibromyalgia Impact Questionnaire Visual Analog Scales (FIQ VASs).

Patients and methods
Twenty-four female patients who fulfilled the ACR-2010 criteria of FM were included in the present study. The SS Scale, FIQR, and FIQ VASs were used to assess symptom severity of FM.

Results
The respective mean of the SS Scale, FIQR, and FIQ VASs were 7.3 ± 2.4, 52.9 ± 22.1, and 39.3 ± 14.2, and they were positively correlated with measure of pain distribution [widespread pain index (WPI)] in our patients. The SS Scale, WPI, FIQR, and FIQ VASs scores were positively correlated with many regional pain distribution sites (upper arm pain and jaw pain at most) and somatic pain symptoms (central nervous system symptoms, musculoskeletal symptoms, otological and hypersensitivity symptoms). The high scores of the SS Scale, FIQR, and FIQ VASs and their positive correlations with most of the regional pain sites and distribution and somatic symptoms indicate the severity of symptoms in the studied population. The FIQ VAS was the only significant independent determinant of FM severity ($P < 0.001$) in backward/stepwise multiple linear regression models.

Conclusion
The SS Scale of the ACR-2010 criteria, FIQR, and FIQ VASs were excellent methods for assessment of symptom severity in our Egyptian FM patients.

Keywords:
bibromyalgia impact questionnaire visual analogue scales, fibromyalgia, revised fibromyalgia impact questionnaire, symptom severity scale

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Introduction

Fibromyalgia (FM) is a syndrome of chronic widespread pain and tenderness that occurs more frequently in female individuals and has an estimated prevalence of 2–6% in the general population [1–3]. It is associated with overall diminished quality of life [4], diminished functional status [5], and higher than expected healthcare utilization [6]. New diagnostic criteria for FM were approved by the American College of Rheumatology (ACR) in 2010 [7]. In these new criteria, the physician-administered tender point count of the ACR criteria 1990 [8] was replaced by patient-reported outcome measures, namely a combination of both Widespread Pain Index (WPI) and Symptom Severity Scale (SS Scale) [7]. The ACR-2010 criteria are simple and practical for clinical diagnosis of FM and are suitable for use in primary and specialty care [7].

All patients with FM experience pain; however, individual patients often vary widely in the severity of associated FM symptoms from which they suffer. Quantification of the severity of associated FM symptoms is required for diagnosis under new ACR criteria 2010 [7], and management of all clinically significant symptoms is recommended for effective FM management [9].

The SS Scale enables assessment of FM symptom severity in patients with current or previous FM and in those to whom the criteria have not been applied. It will be especially useful in the longitudinal evaluation of patients with marked symptom variability [7].

The Revised Fibromyalgia Impact Questionnaire (FIQR) can be used for assessment of functional status and severity of symptoms in FM [7]. The FIQR is a revised version of the FIQ. This version was developed

in an attempt to correct some of the problems in the wording, omissions, concepts, and scoring of the original FIQ. There are several modifications of the FIQ that have been incorporated into the FIQR while retaining the basic domain structure in terms of function, overall impact, and severity of symptoms that are characteristic of FM [9,10].

The Fibromyalgia Impact Questionnaire Visual Analog Scales (FIQ VASs) have properties that make them ideal for clinical use. VASs are simple to score and have been shown to perform as well as longer scales with respect to sensitivity to change and correlation with clinical variables [11].

The aim of this study was to assess symptom severity in Egyptian FM patients using the SS Scale, FIQR, and FIQ VASs.

Patients and methods

Twenty-four female patients with FM were recruited from Rheumatology and Rehabilitation Outpatient Clinic, Minia University Hospital, Minia Governorate, Egypt.

Patients with known systemic illness, evidence of inflammatory rheumatic disease, chronic painful disorders other than FM, and clinically significant or unstable medical or psychiatric disorders were excluded.

All patients fulfilled the ACR-2010 criteria for FM. In the WPI, patients were asked to indicate the regions (maximum 19 regions) of the body in which pain has been experienced over the previous 7 days. Each positive region is given a score of 1 (WPI ranges from 0–19). The Symptom Severity Scale Score is the sum of the severity of the three symptoms (fatigue, waking unrefreshed, and cognitive symptoms) and the extent (severity) of somatic symptoms in general. Each of the three symptoms and the extent of somatic symptoms are scored between 0 and 3 (the final SS Scale score ranges from 0 to 12) [7].

The FIQR was used for assessment of functional status and severity of symptoms over the previous 7 days in all patients with FM. The FIQR is divided into three linked sets of domains. It was scored by summing the scores for each of the three domains (function, overall, and symptoms). Thereafter, divide domain 1 score by three, divide domain 2 score by one (that is, it is unchanged), and divide domain score 3 by two. Finally, add the three resulting domain scores to obtain the total FIQR score (range, 0–100) [12].

The FIQ VAS is a rapid screen that can quantify symptom severity. It is composed of seven visual analogue scales to assess the symptoms of fatigue, sleep quality, depression, anxiety, stiffness, pain, and work disability. It was scored by measuring the distance from the origin to the patient mark in centimeters to yield a 0–10 score for each symptom. The total score is derived by summing the scores from the seven FIQ VASs to yield a 0–70 score [10].

Informed consent was taken from all participants in the study. The study was approved by the ethical committee of the Faculty of Medicine, Minia University, Egypt.

Statistical analysis

Statistical analysis was performed with SPSS statistical software version 17.02 (SPSS, Chicago, IL). The range, mean, and SD were calculated for interval and ordinary variables. Correlation between the study variables was determined by Pearson's correlation for parametric variables. Backward/stepwise multiple linear regression models were calculated with the FIQR as a dependent variable. Independent variables were factors that significantly differ from this dependent variable in univariate analysis. The level of statistical significance was set at a P level less than 0.05.

Results

Demographic data of the studied patients are represented in (Table 1).

Pain was present in all FM patients in the form of dull aching pain in character. Shoulder pain was the commonest among the studied population followed by neck pain, lower arm pain, and lower back pain (Table 2).

There were many somatic symptoms among FM patients. Nonrefreshed sleep and fatigue were present

Table 1 Demographic data of the studied patients

	Patients (n = 24)
Age (years)	
Range	20–60
Mean ± SD	33.7 ± 10.1
Resident [n (%)]	
Urban	5 (20.8)
Rural	19 (79.2)
Occupation [n (%)]	
Working	7 (29.2)
Not working	17 (70.8)
Marital state [n (%)]	
Single	2 (8.3)
Married	21 (87.5)
Divorced	—
Widow	1 (4.2)

in all patients. Majority of patients had headache (91.7%), anxiety (91.7%), nervousness (87.5%), insomnia (87.5%), stiffness (79.2%), muscle pain (83.3%), muscle weakness (25%), dizziness (66.7%), and tinnitus(50%). More than 50% of all patients had loss of appetite and irritable bowel syndrome. Hypersensitivity manifestations were found in the form of sun sensitivity (29.2%) and wheeze (8.3%).

Table 3 represents the WPI, SS Scale, FIQR, and FIQ_VASs scores in the studied patients. The WPI was positively correlated with disease duration (r = +0.4, P < 0.05), whereas the FIQR was positively correlated with patient's age (r = +0.4, P < 0.05).

Correlations of the WPI, SS Scale, FIQR, and FIQ_VASs with sites of pain distributions and somatic symptoms in FM patients are represented in (Tables 4 and 5).

Table 2 Pain distribution according to the WPI in the studied patients

	Patients (n = 24)
Shoulder pain [n (%)]	
Positive	23 (95.8)
Negative	1 (4.2)
Upper arm pain (arm) [n (%)]	
Positive	18 (75)
Negative	6 (25)
Lower arm pain (forearm) [n (%)]	
Positive	20 (83.3)
Negative	4 (16.7)
Buttock pain [n (%)]	
Positive	11 (45.8)
Negative	13 (54.2)
Upper leg pain (thigh) [n (%)]	
Positive	18 (75)
Negative	6 (25)
Lower leg pain (leg) [n (%)]	
Positive	16 (66.7)
Negative	8 (33.3)
Jaw pain [n (%)]	
Positive	10 (41.7)
Negative	14 (58.3)
Chest pain [n (%)]	
Positive	19 (79.2)
Negative	5 (20.8)
Abdominal pain [n (%)]	
Positive	4 (16.7)
Negative	20 (83.3)
Neck pain [n (%)]	
Positive	21 (87.5)
Negative	3 (12.5)
Upper back pain [n (%)]	
Positive	6 (25)
Negative	18 (75)
Lower back pain [n (%)]	
Positive	20 (83.3)
Negative	4 (16.7)

WPI, widespread pain index.

With respect to the sites of pain distribution in FM patients, the WPI was positively correlated with most sites of pain distributions, whereas the areas of both upper arm pain and jaw pain were positively correlated with the WPI, SS Scale, FIQR, and FIQ_VASs (Table 4).

Somatic symptoms were widely represented in our FM patients. Muscular weakness, cognitive symptoms, tinnitus,

Table 3 WPI, SS Scale, FIQR, and FIQ VASs scores in the studied patients

	Patients (n = 24)
WPI	
Range	4–18
Mean ± SD	11.96 ± 3.7
SS Scale	
Range	5–12
Mean ± SD	7.3 ± 2.4
FIQR	
Range	22.3–95.5
Mean ± SD	52.9 ± 22.1
FIQ VASs	
Range	20–65
Mean ± SD	39.3 ± 14.2

FIQ VASs, fibromyalgia impact questionnaire visual analogue scales; FIQR, revised fibromyalgia impact questionnaire; SS Scale, symptom severity scale; WPI, widespread pain index.

Table 4 Correlation between the WPI, SS Scale, FIQR, and FIQ VASs and the sites of pain distribution in FM patients

	WPI	SS Scale	FIQR	FIQ VASs
Upper arm pain (arm)				
r	0.5	0.2	0.4	0.4
P	0.01*	0.2	0.03*	0.01*
Lower arm pain (forearm)				
r	0.6	0.1	0.2	0.2
P	0.001*	0.6	0.2	0.2
Buttock pain				
r	0.5	0.2	0.1	0.2
P	0.01*	0.2	0.5	0.1
Upper leg pain (thigh)				
r	0.7	0.1	0.2	0.2
P	0.001*	0.5	0.2	0.2
Lower leg pain (leg)				
r	0.5	0.1	0.2	0.1
P	0.006*	0.6	0.2	0.4
Jaw pain				
r	0.6	0.5	0.5	0.5
P	0.003*	0.01*	0.009*	0.01*
Lower back pain				
r	0.4	0.2	0.4	0.3
P	0.08	0.2	0.03*	0.09

FIQ VASs, fibromyalgia impact questionnaire visual analogue scales; FIQR, revised fibromyalgia impact questionnaire; FM, fibromyalgia; SS Scale, symptom severity scale; WPI, widespread pain index; *P < 0.05, significant.

Table 5 Correlation between the WPI, SS Scale, FIQR, and FIQ VASs and somatic symptoms in FM patients

	WPI	SS Scale	FIQR	FIQ VASs
Cognitive symptoms				
r	0.1	0.7	0.6	0.6
P	0.4	0.001*	0.003*	0.002*
Irritable bladder syndrome				
r	0.3	0.6	0.4	0.4
P	0.1	0.003*	0.04*	0.07
Unexplained weight loss				
r	0.1	0.4	0.3	0.4
P	0.7	0.08	0.1	0.04*
Muscle weakness				
r	0.6	0.5	0.7	0.6
P	0.001*	0.006*	0.001*	0.001*
Tinnitus				
r	0.3	0.6	0.5	0.6
P	0.1	0.001*	0.006*	0.001*
Hypersensitivity				
r	0.04	0.4	0.2	0.2
P	0.8	0.04*	0.3	0.3

FIQ VASs, fibromyalgia impact questionnaire visual analogue scales; FIQR, revised fibromyalgia impact Questionnaire; SS Scale, symptom severity scale; WPI, widespread pain index; *$P < 0.05$; significant.

Table 6 Multivariate regression analysis among studied parameters using FIQR as a dependent variable

Variables	*B*	SE	*P* value
FIQ VASs	1.049	0.241	0.001*
SS Scale	2.616	1.402	0.07
WPI	0.07	0.611	0.5

B, estimated coefficient; FIQ VASs, fibromyalgia impact questionnaire visual analogue scales; FIQR, revised fibromyalgia impact questionnaire; SS Scale, symptom severity scale; WPI, widespread pain index; *$P < 0.05$, significant.

and irritable bladder symptoms were positively correlated with the WPI, SS Scale, FIQR, and FIQ VASs (Table 5).

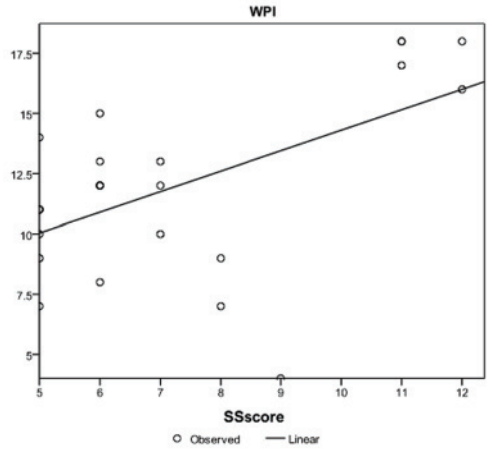
The WPI, as a measure of pain distribution, was positively correlated with measures of FM severity [the SS Scale, FIQR, and FIQ VASs] (Figs 1–3).

The WPI, SS Scale, and FIQ VASs were analyzed by backward/stepwise multiple regression model as predictor measures for FM severity. The FIQ VAS was the only significant independent determinant ($P < 0.001$) that was retained and included in the regression equation as showed in (Table 6). The WPI and SS Scale did not have significant contributions, and therefore they were excluded.

Discussion

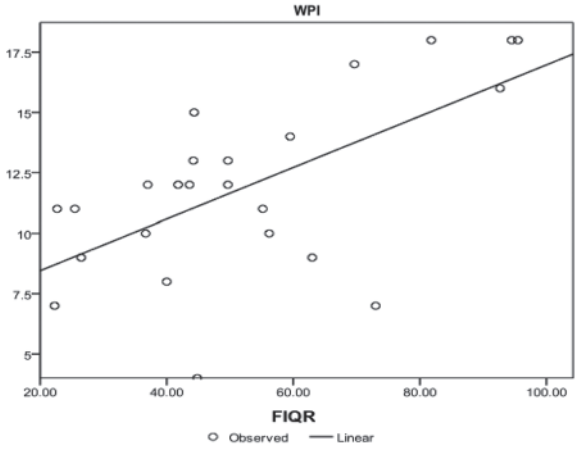
FM has a substantial negative impact on the quality of life, resulting in poor health status, limitations of productivity,

Figure 1



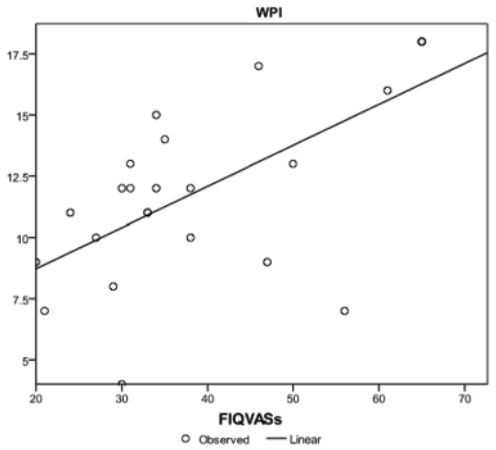
Relationship between the SS Scale and WPI. SS Scale, symptom severity scale; WPI, widespread pain index.

Figure 2



Relationship between the FIQR and WPI. FIQR, revised fibromyalgia impact questionnaire; WPI, widespread pain index.

Figure 3



Relationship between the FIQ VASs and WPI. FIQ VASs, fibromyalgia impact questionnaire visual analogue scales; WPI, widespread pain index.

as well as a reduced ability to complete simple activities of daily living [13–15]. This multidimensional nature of FM has made it difficult to define and assess the severity of FM as a condition. The indeterminate etiology and lack of specific disease markers exacerbate the problem of assessing FM severity [15].

The ability to evaluate and measure the severity of FM as a condition is likely to provide several benefits, including identification of treatment responders in clinical trials and clinical practice. The use of patient self-report is increasingly being accepted and applied as a method to evaluate disease states and management strategies in clinical trials, especially for chronic pain conditions such as FM [16]. Hence, in our study, we were aimed to assess symptom severity in Egyptian FM patients using the SS Scale, FIQR, and FIQ VASs.

All patients with FM in the current study were diagnosed by the ACR-2010 criteria. The mean of the WPI was 11.96 ± 3.7 and the mean of the SS Scale was 7.3 ± 2.4. Similarly, Wolfe *et al.* [7] found that the WPI was 11.4 ± 4.4 and the SS Scale was 8 ± 2.6 in FM patients.

Shoulder pain was the commonest (95.8%) among our FM patients followed by neck pain (87.5%), lower arm pain (83.3%), and lower back pain (83.3%). In agreement with these findings, Friend and Bennett [17] reported percentage of pain sites in 202 primary FM patients, 20 SLE patients, and 31 RA patients without concomitant FM; they found that neck pain was the commonest (91%) in FM patients followed by lower back (79%), shoulders (76%), and arms (69%) pain.

The WPI in our study was positively correlated with most of the sites of pain distribution, and we suggest that the presence of pain in these sites indicates a more widespread pain and a high score of WPI, whereas the SS Scale was positively correlated only with jaw pain ($r = +0.6$, $P < 0.05$), which would be a site to be considered in further studies.

Several methods were developed for assessment of FM severity [10], demonestrated that the revised fibromyalgia impact questionnaire FIQR (an updated version of FIQ) has good psychometric properties and is simple and easy to score. The score of FIQR in our patients was 52.9 ± 22.1 and these high scores indicate great impact of FM on function. Similarly, Friend and Bennett [17] found that patients with FM had a high FIQR score of 56.6.

Boomershine *et al.* [11] used the FIQ VASs for FM assessment, and its score was 46.9 ± 10.6. They concluded that the FIQ VAS is a rapid screening method simplifying FM assessment. The FIQ VAS in our study was used to quantify the severity of individual FM symptoms, and its score was 39.3 ± 14.2.

In our FM patients, higher scores of the SS Scale, FIQR, and FIQ VASs and their positive correlations with most of the sites of pain distribution and somatic symptoms indicate the severity of symptoms among the studied population.

The FIQ VAS was the only significant independent predictor factor for determining measurement of severity in our FM patients ($P < 0.001$). However, the WPI and SS Scale did not have significant contributions in the presence of retained variables, and therefore they were excluded.

Conclusion

FM is a complex syndrome associated with significant impairment in the quality of life and function. The ability to evaluate and measure the severity of FM as a condition is likely to provide several benefits. The FIQR was an excellent and simple method for assessment of function, overall impact, and severity of symptoms in FM patients, whereas the FIQ VAS was a rapid screening method for assessment of severity of symptoms. The ACR-2010 criteria for diagnosis of FM was not only diagnostic, but also the SS Scale can be used as a measure of symptom severity. Further studies using large series might lead to more significant results.

Acknowledgements

Conflicts of interest

None declared.

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