Assessment of responsiveness and minimum important difference of the Maternal perception of Childbirth Fatigue Questionnaire (MCFQ)

Alexandre Delgado[1,2], Paulo Sávio Angeiras de Góes[3], Andrea Lemos[2]

[1]Programa de Pós-Graduação em Medicina Integral, Instituto de Medicina Integral Prof. Fernando Figueira (IMIP) – Recife (PE), Brazil
[2]Programa de Pós-Graduação em Fisioterapia, Universidade Federal de Pernambuco (UFPE) – Recife (PE), Brazil
[3]Programa de Pós-Graduação na Saúde da Criança e do Adolescente, Universidade Federal de Pernambuco (UFPE) – Recife (PE), Brazil

ABSTRACT

Introduction: The assessment of responsiveness and the Minimum Clinically Important Difference (MCID) is the basis for validating the Maternal perception of Childbirth Fatigue Questionnaire (MCFQ). **Objective:** To assess the responsiveness and determine the value of the MCID for the MCFQ. **Methods:** This is an observational study, conducted at HC-UFPE with 50 parturients in active labor. The MCFQ was applied in two moments: in the initial evaluation (EV1), performed at the beginning of labor between 4-6 cm of uterine dilation, and final (EV2), six hours after the first evaluation. Responsiveness was determined by calculating the effect size (ES), and standardized response mean (SRM), considering that values of 0.2, 0.5, and 0.8 points represent respectively small, moderate, or large values of responsiveness. The ability to detect change through the questionnaire was also assessed by the t-test. The level of significance adopted for this analysis was p less than 0.05. The MCID was verified based on the calculation of the standard error of measurement (SEM) index. **Results:** The MCFQ showed values of 0.4 and 0.6 for ES and SEM respectively and a p-value <0.001, thus showing a good capacity for change. The value of the MCID for this population was seven points. **Conclusion:** MCFQ presents a potentially significant change with a value of the MCID of seven points after six hours of active labor.

Keywords: fatigue; delivery, obstetric; surveys and questionnaires.

INTRODUCTION

Maternal fatigue during labor is a symptom generally accepted as part of the participant's experience that is associated with the physical and psychological aspects. Its increase can negatively contribute to maternal-fetal outcomes[1-3]. Maternal fatigue is associated with dysfunctional labor, difficulty with uterine dilation, and changes in the active phase of labor[2,4].

Maternal fatigue during labor does not affect any mental aspect, highlighting the manager's anxiety, motivation, and participation in his parturition process and physical aspects as associated with pain, sleep, and weakness[1-5].

The perception of maternal fatigue is high as a result of intensified uterine contractions, leg cramps, and respiratory and digestive diseases, in addition to the excessive use of synthetic oxytocin and unsupervised exercise[1,4]. Lack of energy supply through feeding during childbirth, dehydration, ketoacidosis, and psychological and situational factors can also increase maternal fatigue during labor[1,2].

Among the non-pharmacological methods to reduce the perception of maternal fatigue during labor, breathing exercises, the use of the Swiss Ball, massage, and thermotherapy stand out[6,7]. As maternal fatigue is more pronounced during the second period of labor, is not recommended directed pushing it increases the risk of the use of pharmacological analgesia and cesarean[8].

Studies involving maternal fatigue during labor used different instruments: Modified Fatigue Symptoms Checklist (MFSC), Visual Analogue Scale (VAS); Fatigue Scale, and Visual Analog Scale for Fatigue (VAS-F). However, these instruments were created and validated to assess muscle fatigue and, in another context, have not been validated for parturition[1,2,9,10].

Currently, a specific instrument has been developed and validated to assess maternal non-maternal fatigue, called the Maternal perception of Childbirth Fatigue Questionnaire (MCFQ). This questionnaire has few items and proved to be a clear, concise, and easy-to-understand instrument for parturients. It has a good face and content validity and adequate internal consistency but its responsivity remains unknown[11]. When using questionnaires in research, they must be considered, allowed, valid, and, mainly, responsive[12].

Responsivity can be defined as the ability of an instrument to accurately detect changes in symptom symptoms and is generally quantified by a numerical score[9]. The Minimum Clinically Important Difference (MCID) is measured as the minimum alteration the instrument is capable of detecting, which allows interpreting if this observed change translates into the improvement or the worsening of the symptoms of individuals[12,13].

The determination of the MCID for an instrument is relevant to distinguish the statistical and clinical significance and from that value, indicate a magnitude of change with representativeness and clinical interpretability.

Thus, this study aimed to assess the responsiveness and determine the value of MCID for MCFQ after the progression of labor.

METHODS

This study was carried out at the Obstetric Center of Clinical Hospital das Clínicas, Universidade Federal de Pernambuco (HC-UFPE). This study was approved by the Research Ethics Committee of the Health Sciences Center at UFPE, CAAE 62323016.9.0000.5208. To participate in the study, all individuals signed a free and informed consent form.

Study and sample design

This is an observational study, in which the MCFQ was assessed for the responsiveness and value of the MCID. The recommendations of the Consensus-based Standards for the selection of health Measurement Instruments (COSMIN) and Terwee et al.[11] were followed. The sample consisted of 50 pregnant women in labor, a number necessary to assess the responsiveness of health instruments[14]. They included the first 50 volunteers who were able to answer the two assessments of the questionnaire.

Participants

The inclusion criteria considered for this research were: pregnant women aged 19-35 years, primiparous or multiparous, and who were in active labor. The active phase of labor was considered: cervical-uterine dilation equal to or greater than 4 cm of dilation and uterine dynamics with contractions equal to or greater than 3 in 10 minutes, strong, rhythmic, and lasting more than 30 seconds.

Pregnant women who were in the expulsive period and diagnosed with any previous clinical condition that presents fatigue as a recognized associated symptom (e.g. fibromyalgia, rheumatoid arthritis, cardiorespiratory diseases, chronic fatigue syndrome, among others) were excluded.

Procedure

The participants were evaluated in two moments: in the initial evaluation (EV1), performed at the beginning of labor between 4-6 cm of uterine dilation, and final (EV2), after six hours of the first evaluation. Participants followed the usual service routine.

The usual routine of the service included: assistance from the team of obstetricians and nurses. Patients are instructed to adopt upright positions and make use of the Swiss Ball. Non-pharmacological methods of pain relief are also offered: thermotherapy, massage, and the presence of a companion.

In these two moments, the individuals answered to two instruments: the first was a form developed specifically for this research, which contained sociodemographic data (age, marital status, education, family income, occupation, and origin); obstetric data (number of pregnancies, parity, gestational age) and the second

instrument was the MCFQ. The assessments were carried out by a researcher with five years of experience in labor.

The MCFQ is based on an attempt to measure the nature and intensity of maternal fatigue during childbirth, to reflect the woman's perception of the fatigue associated with labor. The questionnaire was developed and validated in Brazil, consisting of 15 items and three factors related to physical, mental, and psychological fatigue. The instrument presents semantic, idiomatic, and conceptual equivalence to the context of the perception of maternal fatigue in labor. It has good reliability with a Cronbach's Alpha coefficient of 0.85. The response options are presented on a 5-point Likert scale: 1 - Not at all; 2 - a little; 3 -More or less; 4 - A lot; and 5 - Extremely. In the end, the scale uses a score of 5 points on each item to check the intensity of maternal fatigue. Parturients are categorized as presenting low fatigue (15-50 points) and high fatigue (51-75 points)[11].

The instruments were applied in an interview format, since, in the context of childbirth, it is difficult and inappropriate to perform the self-administered format, as this is a moment that does not allow much concentration for reading, interpretation, assimilation, and responses to the items. The interview lasted between 5 and 10 minutes and was carried out while the parturient women did not present pain or any discomfort that made the answers impossible. When pregnant women reported pain or discomfort, the interviews were interrupted and resumed when the symptoms improved.

Statistical analysis

The sample was characterized using descriptive statistics and the data exposed in frequency distribution tables, for categorical variables, and measures of central tendency and dispersion, for numerical variables. The Kolmogorov-Smirnov parametric test was performed to assess the normality distribution of the scale and the t-test for responsiveness, accepting values in which: EV1 <EV2. The level of significance adopted for this analysis was p less than 0.05 and the analyzes were performed using the statistical programs SPSS version 22.0 and MedCalc.

The effect size (ES), standardized response mean (SRM), and standard error of measurement (SEM) were calculated to determine the MCID.

The ES is the difference between the average score of the instrument in the first assessment (EV1) (x1) and the second assessment (EV2) (x2), divided by the standard deviation of the baseline score (s1) by the Equation: $ES=x2-x1/s1$.

SRM was calculated by the difference between the average of the instrument's score in EV1 (x1) and EV2 (x2), divided by the standard deviation of the scores baseline (s1) and final (s2): $SRM=x2-x1/s2-s1$.

Responsiveness was measured by adopting the following values for the interpretation of ES and SRM: 0.2 (small), 0.5 (moderate), and 0.8 (large).

The MCID was calculated using the SEM value using the product of the baseline standard deviation with the square root of (1-r), where r is the reliability coefficient (Cronbach's alpha) or intraclass correlation: $SEM=s1 \times \sqrt{1-r}$.

The MCID value was calculated by the SEM product with the square root of two and by the cut-off value of 1.96, which represents that of a normal standard curve. It was used a 95% confidence interval: $DMI=1.96 \times \sqrt{2} \times SEM$.

RESULTS

The average age of the pregnant women was 23.34 (SD=6.46) years and the gestational age was 40.23 (SD=1.18) weeks of gestation (Table 1). Most had the first experience of childbirth (40.0%), were in a stable union (45%), had more than 12 years of schooling (40%), and had a per capita income of less than 1 minimum wage (63%).

Cervical dilation and maternal fatigue assessed by the MCFQ increased progressively after six hours in the second assessment (Table 2).

The MCFQ showed a significance value of 0.96 in the normality distribution test. When comparing the two moments of evaluation of the questionnaire by the t-test, there was a significant difference of 0.001. Table 3 shows the values of the responsiveness

Table 1: Characteristics of the participants.

Characteristics	Parturients n=50
Age, years - mean (SD)	23,34 ± 6,46
Marital status	n (%)
Single	11 (22)
Married	13 (26)
Consensual Union	3 (6)
Divorced	23 (46)
Educational level	n (%)
4 - 7 years	13 (26)
8 - 11 years	17 (34)
>12 years	20 (40)
Per capita income	n (%)
<1 Minimum Wage	32 (64)
1-3 Minimum Wage	18 (36)
Occupation	n (%)
Housewife	28 (56)
Others	22 (44)
Origin	n (%)
Metropolitan region of Recife	2 (1)
Pernambuco countryside	48 (99)
Gestational age, weeks - mean (SD)	40.23 ± 1.8
Parity	n (%)
Nulliparous	20 (40)
Primiparous	16 (32)
Second-birth	10 (20)
Multiparous	4 (8)
Abortion	n (%)
Yes	5 (10)
No	45 (90)

Table 2: Characteristics of fatigue and cervical dilation in the first assessment (EV1) and the second assessment (EV2).

	First Assessment (EV1)	Second Assessment (EV2)	P value
Cervical dilation (centimeters) n (%)			0.05
4 centimeters	29 (58%)	-	
5/7 centimeters	21 (42%)	12 (23%)	
8/10 centimeters	-	38 (77%)	
MCFQ			0.001
Low Fatigue	40 (79%)	8 (17%)	
High Fatigue	10 (21%)	42 (83%)	

Table 3: Responsiveness and MID of the Maternal Perception of Childbirth Fatigue Questionnaire (MCFQ).

ES	SRM	SEM	MID
0.4	0.6	10.82	7.2

ES: effect size; SRM: standardized response mean; SEM: standard error of measurement; MID: minimal important difference.

indexes of the questionnaire used, in addition to the MCID. It can be noted that the MCFQ used in this study has a moderate capacity for change.

DISCUSSION

The Maternal perception of Childbirth Fatigue Questionnaire (MCFQ) showed good responsiveness and a Minimum Clinically Important Difference (MCID) of seven points.

The ability to change the response through responsiveness was assessed after six hours of labor from the first assessment and the volunteers maintained the usual service routine. Even without any intervention, this change was expected, since labor presents physiological, clinical, and situational factors that develop maternal fatigue[1,9].

The good responsiveness of the MCFQ makes it considered an instrument capable of detecting changes in maternal fatigue in labor over time, demonstrating the questionnaire's ability to measure such changes. The value found by MCID for this change was seven points. MCID refers to the smallest difference in the score of the outcome of interest that the reporting patients perceive as important, both beneficial and harmful, which would lead the patient or clinician to consider a change in the outcome[15]. In this sense, the MCFQ will only reflect a perceptual clinical change for better or worse if there is a seven-point change in its score. This information is important, as it makes the instrument more robust in its measurement proposal with immediate clinical applicability. There are currently more than 56 instruments and questionnaires that assess fatigue in various contexts and populations in the literature. However, only 50% report this information[16].

A limitation of this study was the lack of an intervention to better interpret the questionnaire's ability to change through responsiveness.

The relevance of evaluating MCFQ responsiveness and MCID involves scientific issues and repercussions on obstetric clinical practice. The application of a specific instrument in studies for the early identification of maternal fatigue during labor will guide the health care provided to the parturient and her baby, in addition to serving as a metric to evaluate and monitor the behaviors adopted by the care team in the context of childbirth.

Conclusion

The Maternal perception of Childbirth Fatigue Questionnaire (MCFQ) presents good responsiveness, based on several types of measures after six hours of the progression of labor, and in this context, it presents a minimum change of seven points which guides its clinical applicability.

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