

# Assessing the Association between Score Differences on the Premenstrual Symptoms Impact Survey (PMSIS) and Health-Related Quality of Life (HRQOL)

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## BACKGROUND

Up to 80% of the reproductive age women experience at least a few symptoms of physical discomfort or mood changes prior to and/or at the first few days of their menstrual cycles (premenstrual symptoms).<sup>1,2</sup>

While the majority of the existing instruments document the presence and severity of premenstrual symptoms, recently, a reliable and brief instrument that is psychometrically validated is developed to evaluate the impact of such symptoms on women's health-related quality of life (HRQOL).<sup>3</sup>

The Premenstrual Symptoms Impact Survey (PMSIS) includes six items with six response choices for each item. The intended use of the PMSIS is to provide norm-based feedback to women about the impact of moderate to severe premenstrual symptoms on their HRQOL and prompt the symptom control.

## OBJECTIVE

To assess the association between health-related quality of life and the score differences on the Premenstrual Symptoms Impact Survey (PMSIS)

## METHODOLOGY

### Data Source

- Premenstrual Symptoms Impact Survey development and validation study (PMSIS study): An internet survey study from a sample of the national representative female population<sup>3</sup>

### Diagnoses in the PMSIS study

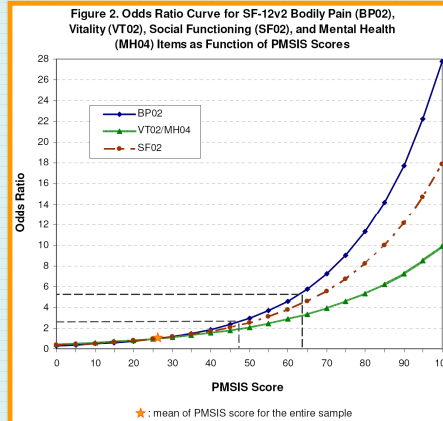
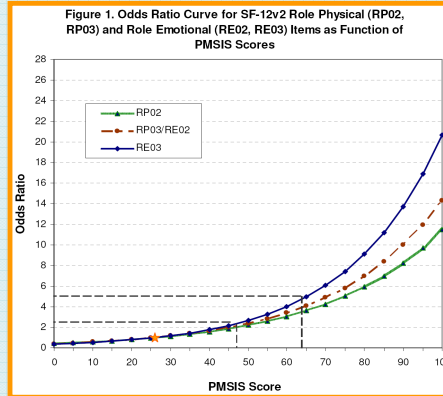
- Women were classified as "at risk for PMS" based on the retrospective component of the American College of Obstetricians and Gynecologists (ACOG) criteria<sup>4</sup>
- Women were classified as "at risk for PMDD" based on the retrospective component of the DSM-IV-TR criteria<sup>5</sup>

### Measures

- SF-12v2 Health Survey<sup>6</sup>
  - A generic measure including 12 items in eight domains of HRQOL
    - Physical Functioning (PF)
    - Role limitation due to Physical health (RP)
    - Bodily Pain (BP)
    - General Health perception (GH)
    - Vitality (VT)
    - Role limitation due Emotional problems (RE)
    - Social Functioning (SF)
    - Mental Health (MH)
- Premenstrual Symptoms Impact Survey (PMSIS)
  - Scoring: the sum of the responses to the six items of the PMSIS was standardized on a scale from 0-100 with higher values indicating more severe impact of premenstrual symptoms to women's daily life.
  - Items in the PMSIS: During your last premenstrual period,
    1. how much of the time did you feel frustrated because of your premenstrual symptoms?
    2. how much of the time did you have mood swings because of your premenstrual symptoms?
    3. how much of the time did your premenstrual symptoms limit your ability to concentrate on work or daily activities?
    4. how often did you get tense (e.g., anxiety, muscular tightness) because of your premenstrual symptoms?
    5. how much of the time have your premenstrual symptoms left you too tired to do work or daily activities?
    6. how often did your premenstrual symptoms keep you from socializing?

### Analysis Procedures

- HRQOL items were selected based on the Spearman's rho correlation between PMSIS scale scores and SF-12v2 items.
- Selected items were dichotomized to the presence/absence of functional impairment to facilitate the interpretation of the outcome variables, and were served as dependent variables regressed onto the standardized PMSIS scores.
- Regression coefficients generated from the logistic regression models were used to derive the odds ratios of experiencing a particular HRQOL outcome as a function of PMSIS scores that differ from the reference value (the mean PMSIS value of the entire sample).



Odds Ratios for Dichotomized Outcome Variable Associated with PMSIS Score Difference from the Reference Value

Label	Outcome Variable Content	b	Score Increase	
			21-point*	38-point*
RP02	Accomplished less than you would like during the past 4 weeks as a result of physical health	0.033	2.000	3.504
RP03	Were limited in the kind of work or other activities as a result of physical health	0.036	2.130	3.927
BP02	Pain interfered with normal work	0.045	2.573	5.529
VT02	Having a lot of energy	0.031	1.917	3.248
SF02	Physical health or emotional problems interfered with social activities	0.039	2.268	4.402
RE02	Accomplished less than you would like during the past 4 weeks as a result of emotional problems	0.036	2.130	3.927
RE03	Did work or other activities less carefully than usual during the past 4 weeks as a result of any emotional problems	0.041	2.366	4.749
MH04	Feeling downhearted and depressed	0.031	1.917	3.248

\* PMSIS scores ± 1, approximately the mean PMSIS score for women at risk for PMS but not qualified for PMDD, which is about one standard deviation above the reference value (entire sample mean = 26.1).  
 † PMSIS scores ± 1, approximately the mean PMSIS score for women at risk for PMDD

Figures 1 & 2 Odds ratio curves derived for the outcome variables for illustrative purposes. Each curve represents the OR associated with an outcome variable as a function of the PMSIS scores. The reference value for interpreting the OR is a patient with a PMSIS score of 26.1 (the entire sample mean). In Figure 1, the regression coefficients were the same for RP03 and RE02, and thus the OR curves overlapped. In Figure 2, the OR curves of VT02 and MH04 overlapped due to the same regression coefficients.

For example, in the OR curve for RE03 in Figure 1, a 21- and 38-point PMSIS score increase from the population mean (26.1) was associated with a 1.4 and 3.7 times increased risk, respectively (OR = 2.37 and 4.75) of reporting to the question of "did work or other activities less carefully than usual as a result of emotional problems" at least "some of the time" over the past 4 weeks.

In the OR curve for SF02 in Figure 2, a 21- and 38-point PMSIS score increase from the population mean (26.1) was associated with a 1.3 and 2.3 times increased risk, respectively (OR = 2.27 and 4.40) of reporting to the question of "Physical health or emotional problems interfered with social activities" at least "some of the time" over the past 4 weeks.



## RESULTS

### Descriptive Results

- Study sample: N=971
- "At risk for PMS": n=172 (17.7%)
- "At risk for PMDD": n=58 (6.0%)
- Mean age: 31.4±7.3
- Overall study sample: 26.1±21.3
- "At risk for PMDD": 64.0±19.0
- "At risk for PMS": 53.0±19.0
- "At risk for PMS but not qualified for PMDD": 47.4±16.5
- "Not at risk for PMS": 20.3±16.8

- Spearman's rho correlations were significant with all SF-12 items (p<0.0001), ranging from the lowest with physical functioning items (0.14-0.18) to the highest with social functioning item (0.45).
- Eight items were selected (Spearman's rho correlations range from 0.29-0.45), and were dichotomized as the outcome variables for logistic regression analyses.
- All eight logistic regression models were significant (p<0.0001). Logistic regression coefficients and odds ratios associated with the PMSIS score differences are presented in Table. Figures 1 & 2 provide the odds ratio curves of the outcomes associated with the scores of PMSIS.

### Women with a PMSIS score at the mean value of "at Risk for PMS but not qualified for PMDD" were associated with

- A 86% increased risk of not having a lot of energy (VT02) and feeling downhearted and depressed (MH04)
- A 146% increased risk of pain interfering with normal work (BP02)

### Women with a PMSIS score at the mean value of "at risk for PMDD" were associated with:

- A 225% increased risk of not having a lot of energy (VT02) and feeling downhearted and depressed (MH04)
- A 453% increased risk of pain interfering with normal work (BP02)

## LIMITATIONS

Data used in this study were from the same data source for the PMSIS development and validation. Additional validation is necessary for proper instrument interpretation that can provide guidance in clinical practice and clinical trial research of women suffering from premenstrual disorders.

A cross-sectional dataset was collected using a single online sample. Further analyses should be conducted to test the model validity in other samples and other modes of administration (such as in-person visits at the physician's office).

## CONCLUSIONS

Higher PMSIS scores (more severe impact due to premenstrual symptoms) were significantly associated with diminished role functioning, physical and mental well-being.

The extent of association with the PMSIS score varied across the outcome variables, with the largest association related to bodily pain and role limitation due to emotional problems.

Interpretation of the PMSIS score difference in absolute risks using odds ratios depended on the score range considered (i.e., the reference value).

PMSIS can be used for screening and monitoring the health-related quality of life in women with premenstrual disorders.

### References

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