Assessing Work Productivity Impairment in Premenstrual Syndrome (PMS) and Premenstrual Dysphoric Disorder (PMDD)

Geoffrey Hammond, PhD, Aaron S Yarlas, PhD, Min Yang, MD, PhD[1], Joseph Gricar, MS[2]

[1]QualityMetric Incorporated, Lincoln, RI; [2]Independent Health Care Consultant, New York, NY

ABSTRACT

OBJECTIVE Premenstrual Syndrome (PMS) and Premenstrual Dysphroric Disorder (PMDD) can have significant impact on women's work productivity. The objective of this study was to assess the degree of productivity impairment associated with PMS and PMDD.

METHODS Data were collected through an online survey of employed females aged 18-45 years (N=634), with some premenstrual complaints such as irritability, depression, headache, and abdominal bloating. Responses from the Work Productivity and Activity Impairment Questionnaire (WPAI) and Work Limitations Questionnaire (WLQ) and its subscales (Time Management, Physical, Mental/Interpersonal and Output) were analyzed. The retrospective criteria of the American College of Obstetricians and Gynecologists (ACOG) and the DSM-IV-TR were used to identify women with PMS and PMDD, respectively. The study controlled for age using multivariate ANOVA and compared the following groups: 1) women who did not meet criteria for PMS or PMDD (66.4%); 2) women who met the criteria for PMS but not PMDD (18.9%); and 3) women who met the criteria for PMDD (14.7%).

RESULTS Multivariate ANOVA showed significant differences across the three groups for the composite Productivity Loss of the WLQ and its subscales as well as for the WPAI (all p<.001). When compared to women without PMDD or PMS, the model estimated greater work impairment scores for the PMDD group than for the PMS group. Post-hoc analysis revealed significant differences in scores between all groups for all outcomes (p<.05) except between PMS and PMDD groups for the WLQ-Time Management and PMS and non-PMS/PMDD groups for the WLQ-Physical.

CONCLUSION Presence of PMS and PMDD substantially impairs women's work productivity.

BACKGROUND

Irrespective of the severity, premenstrual disorders, including both premenstrual syndrome (PMS) and premenstrual dysphoric disorder (PMDD), can have substantial impact on women in their daily lives. Studies have shown that the burden of premenstrual symptoms is multidimensional, on health-related quality of life (HRQOL),[1-3] health economic impact,[3,4] and work productivity.[5-8]

Specifically, studies consistently demonstrated that the presence of PMS and PMDD is associated with reduced productivity and increased absenteeism.[2,3,6,8,10]

OBJECTIVES

To evaluate the degree of work impairment associated with three differing level of severity in premenstrual symptoms: 1) women with no PMS or PMDD, 2) women with PMS but not PMDD; and 3) women with PMDD.

METHODOLOGY

Data Sources

- Study Overview : An internet survey study including eligible participants of the U.S. female members of the Zoomerang panel
  - 18 – 45 years old
  - Employed women with regular menstrual cycles for the past three months
  - Retrospectively reported at least one of the premenstrual symptoms from the American College of Obstetricians and Gynecologists (ACOG) 2000 diagnostic criteria for PMS[11]
- Survey Instruments
  - Premenstrual Symptoms Impact Survey (PMSIS™)[12]
  - SF-12v2® Health Survey[13]
  - Work Limitations Questionnaire (WLQ)[14]
  - Work Productivity and Activity Impairment Questionnaire: Specific Health Problem (WPAI:SHP)[15]
- Premenstrual disorder classification criteria
  - Retrospective component of the ACOG criteria for the diagnosis of PMS
  - Retrospective component of the DSM-IV-TR criteria for the diagnosis of PMDD

Analysis Procedures

- Dependent Variable: premenstrual symptoms severity groups (i.e., with no PMS or PMDD; with PMS but not PMDD; and with PMDD).
- Independent variables
  - Model Set I: WLQ: Productivity Loss and associated subscales, including Time Management, Physical, Mental Interpersonal, and Output Scale
  - Model Set II: WPAI: SHP (WPAI: Work Impairment, WPAI Activity Impairment)
  - Model Set III: PMSIS scores
- Covariates: age (current, menarche age), race (white vs. non-white)

Table 1 – Associations between WLQ Composite Scale and Subscales, WPAI, and PMSIS (Spearman Rho)

	WLQ: Time Management	WLQ: Physical	WLQ: Mental Interpersonal	WLQ: Output	WLQ: Productivity Loss	WPAI: Work Impairment	WPAI: Activity Impairment
WLQ: Physical	0.46						
WLQ: Mental Interpersonal	0.74	0.43					
WLQ: Output	0.72	0.47	0.79				
WLQ: Productivity Loss	0.83	0.62	0.91	0.89			
WPAI: Work Impairment	0.54	0.42	0.51	0.50	0.56		
WPAI: Activity Impairment	0.58	0.42	0.55	0.51	0.58	0.85	
PMSIS	0.52	0.36	0.55	0.50	0.56	0.65	0.69

WLQ: Work Limitations Questionnaire, WPAI: Work Productivity and Activity Impairment Questionnaire;
PMSIS: Premenstrual Symptoms Impact Survey.

Table 2 – Comparisons of WLQ Composite Scale, Subscales, WPAI, and PMSIS by Premenstrual Symptoms Severity

Mean (SD)	No PMS/PMDD (n=421)	PMS not PMDD (n=120)	PMDD (n=93)	F-Statistic	Cohen's d
WLQ: Time Management	12.5 (0.8)	23.1 (1.6)	27.0 (1.9)	34.6**	0.31
WLQ: Physical	10.7 (1.0)	14.5 (1.8)	22.8 (2.1)	14.1**	0.21
WLQ: Mental Interpersonal	12.5 (0.9)	21.3 (1.7)	28.6 (1.9)	34.6**	0.32
WLQ: Output	9.7 (0.9)	16.2 (1.7)	24.5 (2.0)	25.4**	0.27
WLQ: Productivity Loss	0.03 (0.002)	0.05 (0.004)	0.07 (0.004)	40.1**	0.29
WPAI: Work Impairment	0.15 (0.01)	0.31 (0.02)	0.47 (0.02)	111.3**	0.51
WPAI: Activity Impairment	0.18 (0.01)	0.37 (0.02)	0.52 (0.02)	123.8**	0.53
PMSIS	30.8 (0.9)	47.6 (1.7)	59.2 (1.9)	110.6**	0.51

**:Multivariate ANOVA is significant at the 0.01 level (2-tailed).

Presented at the ISPOR, 14th Annual International Meeting, May 16-20, Florida, FL. This study was supported by Bayer HealthCare Pharmaceuticals Inc. For additional information, please contact Min Yang, (401)334-8800 or myang@qualitymetric.com.

RESULTS

Among 634 eligible women, 559 (88.2%) were white and the mean (SD) age was 32.4±7.8.

PMSIS was moderately correlated with all productivity measures and their subscales, using WLQ and WPAI (Table 1).

Multivariate ANOVA results indicated a significant overall difference between the three groups differed by the severity level of premenstrual symptoms on all of the measures (Table 2).

- For the WLQ time management scale, a significant higher (worse) mean score was observed in the PMS and the PMDD groups, when compared to the non-PMS/PMDD group. No significant difference between the PMS and PMDD groups was observed.
- Similar to the WLQ time management scale, a significant higher (worse) mean score was observed on the WLQ physical scale in the PMS and the PMDD groups, when compared to the non-PMS/PMDD group. No significant difference between the PMS and PMDD groups was observed.
- For the WLQ mental/interpersonal and output scales, and its productivity loss composite scale, and WPAI work and activity impairment, all comparisons were significant. Women who had PMS but not PMDD had significantly worse scores than women who had no PMS or PMDD; women with PMDD had highest (worst) mean scores in all three groups.
- PMSIS showed a similar pattern of results to the productivity measures. All group comparisons were significant. Women with PMDD had the highest (most impact) score on PMSIS and women who did not meet either the PMS or the PMDD criteria had the lowest (least impact) score on PMSIS.
- For all measures, the effect size was moderate to large, indicating statistically as well as practically significant findings.

LIMITATIONS

This is a patient-reported outcome study based on online internet survey.

Only retrospective component of the ACOG and DSM-IV-TR diagnostic criteria were used for determining whether women were likely to have PMS or PMDD.

Symptom checklist was used for premenstrual symptom complaints.

CONCLUSIONS

The results indicate that presence of premenstrual disorder (both PMS and PMDD) negatively impacts work productivity.

Results showed that measures assessing the work productivity are closely associated to the severity of premenstrual symptoms.

References

1. Barnard K, Frayne SU, Skinner KM, Sullivan LM. Health status among women with menstrual symptoms. J Womens Health 2003;12:911-9
2. Borenstein JE, Dean BB, Endicott J, et al. Health and economic impact of the premenstrual syndrome. J Reprod Med 2003;48:515-24
3. Yang M, Wallenstein G, Hagan M, et al. Burden of Premenstrual dysphoric disorder on health-related quality of life. J Womens Health 2008;17:113-21
4. Borenstein JE, Chiou CF, Dean BB, Wong J, Wade S. Estimating direct and indirect costs of premenstrual syndrome. J Occup Environ Med 2005;47:26-33
5. Chawla A, Swindle R, Long S, Kennedy S, Sternfeld B. Premenstrual dysphoric disorder: is there an economic burden of illness? Med Care 2002;40:1101-12
6. Dean BB, Borenstein JE. A prospective assessment investigating the relationship between work productivity and impairment with premenstrual syndrome. J Occup Environ Med 2004;46:649-56
7. Dean BB, Borenstein JE, Knight K, Yonkers K. Evaluating the criteria used for identification of PMS. J Womens Health 2006;15:546-55
8. Takeda T, Tasaka K, Sakata M, Nurata Y. Prevalence of premenstrual syndrome and premenstrual dysphoric disorder in Japanese women. Arch Women Ment Health 2006;9:209-12
9. Hylan TR, Sundell K, Judge R. The impact of premenstrual symptomatology on functioning and treatment-seeking behavior: Experience from the United States, United Kingdom, and France. J Womens Health Gend Based Med 1999;8:1043-52
10. Robinson RL, Swindle RW. Premenstrual symptom severity: Impact on social functioing and treatment seeking behaviors. J Womens Health Gend Based Med 2000;9:757-68
11. American College of Obstetricians and Gynecologists (ACOG). Premenstrual syndrome. Washington, DC: ACOG, 2000, vol. 15
12. Wallenstein GV, Blaisdell-Gross B, Gajria K, et al. Development and Validation of the Premenstrual Symptoms Impact Survey (PMSIS): A Disease-Specific Quality of Life Assessment Tool. J Womens Health 2008;17:439-50
13. Ware JE, Kosinski M, Bjorner JB, et al. How to Score Version 2 of the SF-12 Health Survey (with a Supplement Documenting Version 1). Lincoln, RI: QualityMetric Incorporated, 2002.
14. Lerner D, Amick BC 3rd, Rogers WH, Malspeis S, Bungay K, Cynn D. The Work Limitations Questionnaire. Med Care 2001;39:72-85.
15. Prasad M, Wahlqvist P, Shikiar R, Shih YC. A review of self-reported instruments measuring health-related productivity. Pharmacoeconomics 2004: 22(4):225-244/