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Perimenstrual Symptoms of Korean Women Living in the USA: Applicability of the WDHD(Women's daily health diary) on Prospective Report

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Purpose. To compare perimenstrual (premenstrual, menstrual, postmenstrual) symptoms by concurrent reporting using the Women's Daily Health Diary (WDHD) and by retrospective reporting using the Moos Menstrual Distress Questionnaire (MMDQ).

Methods. A prospective and retrospective study was conducted among 31 Korean women, aged 27 to 48 yrs, living in the USA.

Results. On the prospective report using the WDHD, the most severe complaints were fatigue or tiredness (1.48 ±.98), sensation of weight gain (.88±98), increased appetite (.79±.96) in premenstrual phase, fatigue or tiredness (1.34±.85), backaches (1.06±.79), and bloating or swelling of the abdomen (.93±.86) during the menstrual phase. On the retrospective report using the MMDQ, the most severe complaints during the premenstrual phase were fatigue (2.2 6±1.65), irritability (2.06±1.48), and backaches (1.97±1.68) and during the menstrual phase backaches (2.35±1.62), fatigue (2.29±1.75), and cramps (2.23±1.80). According to both measurements of PMS symptomology during the premenstrual and menstrual phases, the most frequently reported symptom was fatigue or tiredness. Highly rated symptoms on the MMDQ and on the WDHD were found to be similar.

Conclusion. The WDHD was found to be suitable for daily prospective PMS assessment, which will be necessary for the screening and management of women with severe PMS.

Key Words : PMS, Korean, MMDQ, WDHD

INTRODUCTION

Perimenstrual symptoms occur immediately before and during menstruation and include a variety of symptoms ranging from irritability to swelling (Woods, Taylor, & Lentz, 1992). Physical, psychological, and behavioral changes may vary across the menstrual cycle phase as well as across cultures (Fitzgerald, 1990).

However, cultural variation in the prevalence of premenstruation symptoms may have been due to differences in assessment methods, with prospective recording yielding a lower prevalence rate than retrospective recording (Woods et al, 1992; Yu, Zhu, & Li, 1996). Many women have a misperception about the meaning of Post Menstrual Syndrome (PMS) and may amplify

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their premenstrual changes during recall, reflecting cultural stereotypes rather than actual experiences (Marvan & Cortes-Iniestra, 2001).

A review of published research findings in Korea revealed the most prevalent symptoms of perimenstrual discomforts in Koreans were pain, fatigue, abdominal bloating (Hong, Park, Kim, & Kim, 1998; Kim, 1995; Kim, Jung, & Chung, 1997; Park & Rhu, 1998).

In studies of other Asian women, Yu et al. (1996) explored perimenstrual symptoms in 16 Chinese women living in an urban area of southeastern China using a retrospective questionnaire, the Moos Menstrual Distress Questionnaire (MMDQ), and a prospective daily symptom diary, the Women's Daily Health Diary (WDHD). Mean scores on the WDHD were significantly ($p < .03$) higher during the perimenstrual phase for the symptoms of fatigue, increased sensitivity to cold, increase sleep, abdominal pain/discomfort, painful or tender breasts, and a decreased sexual desire. There were remarkable discrepancies between the WDHD and the MMDQ regarding psychoemotional symptoms leading Yu et al. to conclude that reports of perimenstrual distress in Chinese women may have been affected by the data collection methods.

Lu (2001) explored the relationship between menstrual attitudes and symptoms in Taiwanese women. Lu recruited 30 healthy women with a mean age of 24.4 years who made daily records of symptoms over a 90-day period using the WDHD. The same women later retrospectively completed the Moos Menstrual Distress Questionnaire (MMDQ). From the prospective WDHD data, during the premenstrual phase, it was found that women in this study most frequently reported experiencing extreme symptoms including weight gain (3.1%), increased appetite (1.8%), and increased sleep (1.8%), and during the menstrual phase, weight gain (3%), depression (2.3%), and fatigue (2.1%) were extreme. In the MMDQ results, more than 60% of the participants retrospectively recalled physical, psychological, and behavioral changes such as fatigue, cramps, mood swings, and taking naps during the premenstrual and menstrual phases. The retrospectively recorded complaints were of a greater severity than those recorded prospectively.

Unfortunately, prospective assessments of perimenstrual symptoms using WDHD have not yet been conducted among Koreans and its implications for PMS research has not been discussed. The purpose of this study was to compare perimenstrual symptoms using the prospective WDHD and the retrospective MMDQ, as well as to suggest that the WDHD would be a suitable instrument for PMS research methodology.

METHODS

Design

This study utilized a descriptive survey design. This study was conducted in two stages to collect cross-sectional/retrospective and longitudinal/prospective data.

Sample

A sample of 31 Korean women living in an urban area of southeastern Michigan was recruited to participate in the study. Women were included if they: 1) were between 18–45 years of age, 2) had regular menstrual cycles and, 3) could understand and write either Korean or English. Women were excluded from the study if they were: 1) pregnant and lactating, 2) taking medication for psychiatric or medical treatment, 3) experiencing a major gynecological disorder (i.e. endometriosis or menorrhagia), and 4) following a special diet (i.e. weight loss, vegetarian, or therapeutic).

Instruments

Demographic data were collected regarding menstrual history including age at menarche, duration of menstruation, amount of menstruation, length and regularity of menstrual cycle, and birth control history (oral contraceptives). Other data included age, marital status, and height/weight.

The Moos Menstrual Distress Questionnaire (MMDQ) (Moos, 1968; 1985) was also used in stage one to assess premenstrual and menstrual symptoms. This instrument has been widely used in previous PMS studies. The MMDQ was translated into Korean for use in a study by Kim, Hong, Park, & Kim (2000) and has a demonstrated reliability with a Cronbach's alpha of .98. In Kim et al.'s study, 37 items covering 6 factors from the original MMDQ were employed focusing on pain, water retention, automatic reactions, negative affect, impaired concentration and behavioral changes. Subjects were asked to recall the severity of 37 symptoms on a 6-point scale ranging from 0 (not present) to 5 (extreme) in premenstrual, menstrual, and postmenstrual periods respectively. In the current study of Korean women, the reliability of the MMDQ was also high as demonstrated by a Cronbach's alpha = .96.

The Women's Daily Health Diary (WDHD) (Woods, Lenz, Mitchell, Lee & Taylor, 1986) was used to assess the types and severity of daily symptoms prospectively across the menstrual cycle. Assessments included 57 symptoms relating to positive experiences, somatic experiences, psychoemotional sleep patterns, concentration, appetite/nutrition, and symptoms relating to sexual behavior. Subjects were asked to rate their symptoms daily on a 5-point scale ranging from 0 (not present) to 4 (extreme). The WDHD has been used in various studies of ethnic women in prior research (Woods et al., 1992; Yu et al., 1996; Sveinsdottir, 1998). Prior to the implementation of the WDHD in this study, it was used in a preliminary test with 10 Korean women in order to verify the accuracy of the Korean translation and to identify any unclear interpretations. In this preliminary study, the reliability of the WDHD was found to be high with a Cronbach's alpha of .99.

The WDHD includes a list of 57 negative and positive feelings and behaviors frequently reported to change across the menstrual cycle. A factor analysis of the 57 items by Woods et al. (1986) produced a list of 33 symptoms, collectively called the Menstrual Symptom Severity List (MSSL), that cluster together during the premenstrum. In subsequent studies the MSSL was used as the classification criteria for subgroup selection (Mitchell, Woods, & Lentz, 1991).

Data Collection Procedure

The research protocol was approved by the University of Michigan Health Sciences Institutional Review Board (#3328) and was collected between April 10th and June10th, 2002. Access to study participants was accomplished through assistance from leaders of Korean community organizations and churches as well as by posting flyers describing the project in Korean grocery stores. These community leaders were asked to make initial connections with potential subjects, briefly explain the study to them, and to receive verbal permission for contact by the researchers. The principal investigator then contacted each woman by phone or email to make an appointment at her home or church. During the initial visit, subjects read and signed an informed-consent form agreeing to participate in the study. Each participant re-

Table 1. Demographics (N = 31)

Characteristics		Mean ± SD	Number of Participants	Percent
Height (cm)		159.70 ± 4.22	31	
Weight (kg)		51.00 ± 4.62	31	
BMI		19.96 ± 1.90	31	
Menarche (yr)		13.06 ± 1.20	31	
Menstrual Cycle Length (day)		29.54 ± 2.77	31	
Duration of Menstruation (day)		4.93 ± 1.12	31	
Number of Deliveries				
	0		6	19.4
	1		8	25.8
	2		12	38.7
	3		4	12.9
	4		1	3.2
Oral Contraceptive				
	no history of use		27	87.1
	current use		1	3.2
	used only in past		3	9.7
Number of Abortions				
	0		19	61.3
	1		7	22.6
	2		4	12.9
	4		1	.8
Menstrual Regularity				
	2–3 days variation		18	58.1
	1–2 wk variation		6	19.4
	no change		7	22.6
Grade of Menses	slight		9	29.0
	moderate		18	58.1
	heavy		4	12.9

ceived a small gift ($2) as a token of appreciation for her participation.

This study was conducted in two stages to collect retrospective and longitudinal/prospective data. During stage I, subjects completed the Moos Menstrual Distress Questionnaire (MDQ) regarding demographics, general menstrual history, and perimenstrual symptoms which required approximately 30 minutes to complete. In stage II, participants were asked to keep a daily record of perimenstrual symptoms during one complete menstrual cycle, or up to 45 days, beginning with the first day of menses (cycle day 1) using the WDHD. Subjects were asked to spend the same 10 minutes each evening filling out the daily health diary.

Analysis of Data

For the purposes of this study, data recorded in the daily diaries were divided into three phases of the menstrual cycle: 1) premenstrual phase (Pre; days -1 to -5), 2) menstrual phase (M; days 1 to 5), and 3) postmenstrual phase (Post; days 6 to 10 days). Data analyses procedures included descriptive analysis, paired t-test, and Pearson's Correlation Coefficient (SPSS PC+10.0 version software).

RESULTS

Demographic characteristics

Demographic data for the 31 participants are shown in table 1. The women ranged in age from 27 to 48 years

Table 2. Mean, SD, and Mean Differences of 37 MMDQ in Three Phase of Menstrual Cycle (N=31)

Variable	Premenstrual Mean±SD	Menstrual Mean±SD	Postmenstrual Mean±SD	F value	sig
insomnia	.45±1.12	.77±1.12	.32±.83	1.58	
crying	.61±.99	.55±.99	.02±.30	3.57	.032
lower school or work performance	.97±1.38	.77±1.76	.23±.67	3.70	.029
muscle stiffness	.90±1.33	.52±.85	.26±.68	3.33	.040
forgetfulness	.74±1.29	.58±1.12	.52±1.12	.30	
confusion	.71±1.40	.48±1.06	.19±.54	1.85	
take naps; stay in bed	1.48±1.63	1.61±1.75	.81±1.45	2.24	
headaches	1.55±1.82	1.39±1.80	.58±1.20	3.12	.049
skin disorders	.81±1.28	.77±1.31	.42±1.06	.96	
loneliness	.87±1.23	.41±.81	.42±.81	2.24	
stay at home	.61±1.15	1.16±1.57	.42±.81	3.11	.050
cramps	1.23±1.59	2.23±1.80	.23±.56	15.31	.000
dizziness, fainting	1.03±1.28	1.16±1.53	.32±.75	4.19	.018
avoidance of social activity	1.45±1.59	1.71±1.92	.23±.62	8.88	.000
anxiety	.90±1.49	.61±1.15	.26±.63	2.47	.090
backaches	1.97±1.68	2.35±1.62	.26±.68	19.51	.000
cold sweats	.68±1.38	.97±1.62	.23±.67	2.62	.079
lowered judgment	.71±1.24	.65±1.17	.16±.58	2.57	.082
fatigue	2.2 6(1.65	2.29±1.75	.71±1.16	10.61	.000
nausea, vomiting	.55±1.18	.94±1.46	.26±.77	2.61	.079
restlessness	.52±.93	.32±.75	.13±.43	2.18	
hot flashes	.35±.91	.39±.95	.23±.56	.33	
difficulty concentrating	.68±1.17	.68±1.17	.29±.74	1.42	
painful breasts	1.74±1.53	.74±1.09	.16±.45	15.92	.000
distractible	.87±1.23	.81±1.33	.23±.72	3.10	.050
swelling	.90±1.37	.94±1.50	.19±.65	3.57	.032
accidents	.45±1.06	.42±.99	.16±.52	.99	
irritability	2.06±1.48	1.55±1.57	.35±.80	13.52	.000
general aches and pains	1.19±1.56	1.42±1.61	.26±.63	6.52	.002
mood swings	1.48±1.46	1.32±1.42	.35±.80	7.24	.001
depression	1.10±1.40	.84±1.13	.35±.71	3.53	.033
decreased efficiency	1.03±1.33	1.52±1.55	.32±.79	7.01	.001
decreased motor coordination	.33±.75	.58±1.09	.26±.68	1.23	
tension	1.06±1.57	1.00±1.44	.35±.91	2.67	.075
weight gain	1.52±1.61	.90±1.14	.39±.95	6.20	.003
diarrhea	.58±1.34	1.13±1.69	.45±.89	2.22	
constipation	.94±1.67	.26±.58	.39±.76	3.25	.043

Table 3. Mean, SD, and Mean Differences of 57 WDHD Symptoms in Three Phase of Menstrual Cycle (N = 31)

	Premenstrual Mean±SD	Menstrual Mean±SD	Postmenstrual Mean±SD	F value	sig
abdominal pain*	.51±.78	.92±.73	.09±.18	13.87	.000
anger*	.50±.67	.50±.67	.14±.34	.11	
anxiety*	.35±.66	.39±.53	.20±.40	1.10	
awakening during the night*	.55±.77	.66±.97	.23±.62	2.35	
backaches*	.66±.87	1.06±.79	.30±.61	7.66	.001
bloating or swelling of abdomen*	.68±.85	.93±.86	.17±.55	7.90	.001
blurred or fuzzy vision	.34±.60	.33±.61	.14±.53	1.20	
burst of energy or activity	.17±.31	.14±.34	.24±.53	.459	
confusion	.12±.30	.15±.32	.11±.22	.578	
cramp-uterine or pelvic	.16±.33	.27±.54	.07±.17	2.35	
craving for specific food or taste*	.51±.82	.25±.34	.23±.42	2.33	
craving for alcohol	.16±.39	.12±.23	.04±.16	1.19	
decreased appetite	.34±.66	.67±.89	.28±.79	2.18	
decreased food intake*	.37±.80	.58±.86	.28±.74	1.13	
decreased sexual desire*	.47±1.05	.45±.90	.26±.83	1.63	
depression*	.28±.41	.26±.50	.11±.30	1.53	
desire to be alone*	.25±.55	.37±.72	.23±.53	.47	
diarrhea	.27±.64	.39±.61	.11±.28	2.12	
difficulty concentrating*	.43±.83	.45±.70	.23±.49	1.05	
difficulty falling asleep*	.38±.74	.36±.74	.17±.53	.95	
difficulty making decisions*	.25±.66	.23±.58	.10±.33	.69	
dizziness or lightheadedness	.43±.89	.45±.83	.30±.77	.29	
early morning awakening*	.58±.98	.52±.83	.22±.55	1.80	
fatigue or tiredness	1.48±.98	1.34±.86	.85±.95	4.02	.021
feelings of guilt*	.11±.21	.06±.21	.04±.18	.01	
feelings of well being	.79±.78	.60±.68	1.03±.93	2.19	
forgetfulness	.33±.61	.36±.67	.23±.37	.49	
general aches and pains	.56±.73	.57±.70	.23±.51	2.72	.072
headaches*	.50±.73	.53±.74	.33±.59	.74	
hostility*	.19±.49	.15±.32	.03±.24	.57	
hot flashes or sweats*	.28±.61	.26±.58	.02±.18	1.63	
impatient, intolerant*	.36±.67	.33±.56	.03±.21	2.50	.088
impulsiveness	.19±.41	.21±.42	.11±.30	.56	
in control	.19±.32	.33±.50	.03±.20	4.19	.018
increased activity	.46±.68	.29±.49	.48±.69	.51	
increased appetite	.79±.96	.28±.49	.30±.62	5.06	.008
increased food intake	.78±.93	.31±.50	.31±.60	4.67	.012
increased sensitivity to cold*	.55±.98	.42±.83	.17±.38	1.95	
increased sexual desire	.22±.39	.09±.18	.23±.49	1.56	
increased sleeping*	.55±.51	.76±.63	.48±.89	1.39	
intentional self injury	.12±.25	.10±.14	.01±.11	.92	
irritability*	.13±.27	.09±.09	.13±.36	1.05	
loneliness*	.14±.28	.18±.39	.15±.39	.06	
lowered coordination or clumsiness	.25±.54	.33±.55	.10±.28	1.83	
lowered desire to talk or move*	.34±.58	.55±.70	.16±.43	3.47	.035
nausea	.12±.32	.26±.59	.03±.23	1.70	
nervousness	.46±.76	.44±.63	.14±.28	2.90	.060
out of control*	.19±.37	.26±.45	.03±.26	1.87	
painful or tender breasts*	.71±.91	.32±.45	.01±.11	11.21	.000
rapid mood changes*	.30±.63	.34±.50	.12±.26	1.84	
restlessness	.26±.51	.35±.52	.03±.21	2.94	.058
sensation of weight gain*	.88±.98	.61±.72	.19±.35	7.16	.001
skin disorders*	.59±.66	.41±.57	.17±.33	4.78	.011
suicidal ideas or thoughts	.00±.00	.00±.00	.00±.00	1.03	
swelling of hands or feet*	.50±.94	.49±.66	.12±.25	3.28	.042
tearfulness, crying easily*	.15±.35	.11±.32	.02±.11	1.75	
tension*	.17±.48	.20±.46	.01±.14	1.15	

Items marked with * were used in calculating symptom severity scores

old with a mean age of 35.06±5.03. Only two of the 31 women were not married. Regarding children, 26% reported having one child, 39% two children, and 16% three or more children. The mean age at menarche was 13 and the mean menstruation cycle length was reported to be 29.6 days (SD 2.78; range 28-47). Regular menstruation cycles within 2 to 3 days of variation was reported by 58% of the women, and 58.1% graded their menstruation amount as "moderate", with only 12.9% grading it as "heavy".

Perimenstrual symptoms

For the 31 participants in this study reporting retrospectively (MMDQ), the most frequently reported premenstrual symptoms were fatigue (X=2.26±1.65), irritability (X=2.06±1.48), backaches (X=1.97±1.68), painful breasts (X=1.74±1.53), headaches (X=1.55±1.82) and weight gain (X=1.52±1.61). In the menstrual period, the most frequent complaints were backache (X=2.35±1.62), fatigue (X=2.29±1.75), cramps (X=2.23±1.80), activity avoidance (X=1.71±1.92), and increased daytime sleep (X=1.61±1.75). The total mean score of the MMDQ during the premenstrual phase was 37.29 (SD 34.72 range 0-114), in the menstrual phase, 36.74 (SD34.53 range 0-103), and in the postmenstrual phase, 11.77 (SD21.39 range 0-88). Mean scores of the MMDQ in the three phases were significantly different (F = 7.11 p = .001). Of a total 37 symptoms, 25 had significantly different mean scores during the three menstrual phases (Table 2. $p < 0.1$).

In the prospective report (WDHD), the most severe complaints in the premenstrual phase were fatigue or tiredness (X=1.48±.98), sensation of weight gain (X=.88±.98), increased appetite (X= .79±.96), increased food intake (X=.78±.93), painful/tender breasts (X=.51±.91), bloating or swelling of the abdomen (X=.68±.85), and backaches (X=.66±.87). In the menstrual phase, fatigue or tiredness (X=1.34±.85), backaches (X=1.06±.79), bloating or swelling of the abdomen (X=.93±.86), abdominal pain (X=.92±.73), awakenings during the night (X=.66±.97), and increased sleep (X=.76±.63) were highly rated. Of the 57 total symptoms, 16 were significantly different in their mean scores throughout the three different phases of the menstrual cycle (Table 3 $p < 0.1$).

Comparison between the prospective and retrospective symptoms

Generally, highly rated symptoms on the MMDQ and on the WDHD were similar. For further evaluation the Menstrual Symptom Severity List (MSSL), which consists of 33 of the total 57 women's daily symptoms, was used to determine a symptom severity score. The relationship between the MMDQ score and the MSSL score was examined. In the premenstrual period the correlation of symptoms score was r = .516 (p = .003) and in the menstrual period was r = .523 (p = .003) (Table 4).

DISCUSSION

Recalled data has been shown to be often overestimated regarding PMS symptoms on the MMDQ as compared to the prospective symptom report in previous research (Yu et al., 1996). The WDHD uses 5-point scales while the MMDQ uses 6-point scales; therefore an exact comparison between the two instruments is not appropriate. With regards to PMS symptomology both the MMDQ and the WDHD measure retrospectively, and during premenstrual and menstrual phase the most frequent complaints were somatic such as fatigue, tiredness, abdominal discomfort, and breast pain. This finding is consistent with other Asian research as reported in Chinese women (Yu. et al, 1996) and in Taiwanese women (Lu, 2001). However, in this study psychoemotional symptoms were not highly ranked, which is inconsistent with Chinese women who showed irritability and

Table 4. Correlations between MSSL Scores and MMDQ Scores (N=31, *p* value)

	MSSL (1)	MSSL (2)	MSSL (3)	MMDQ (1)	MMDQ (2)	MMDQ (3)
MSSL(1)	1.00	.892**	.657**	.516**	.469**	.181
		(.000)	(.000)	(.003)	(.008)	
MSSL(2)		1.00	.814**	.454*	.523**	.257
			(.000)	(.010)	(.003)	
MSSL(3)			1.00	.098	.260	.168

** $p > 0.01$ * $p > 0.05$

(1) premenstrual, (2) menstrual , (3) postmenstrual

mood swings as severe symptoms (Yu et al, 1996).

Symptoms related to food, appetite, and sleep were highly rated among the 31 women, which is consistent with findings among Western women (Sveinsdottir, 1998). In the current study, of the severe symptoms complained of during the premenstrual period in the prospective report (WDHD), sensation of weight gain, increased appetite, and increased food intake were highly ranked. This suggests an effect of food intake on PMS symptomology and should be further studied.

A relatively high correlation between the MMDQ and the MSSL demonstrated that the MSSL will be a suitable instrument for PMS measurement among Koreans, as it has been among other Asians (Lu, 2001; Yu et al., 1996), and Western women (Mitchell et al., 1994; Sveinsdottir, 1998).

A Limitation of this study was the small sample size and the women's awareness of the research purpose. Therefore, in further study obtaining a large sample of women living in Korea will be important for distinguishing the differences in geographic location from ethnicity. More technologically advanced collection methods, such as the use of a PDA (Personal Digital Assistant) or a hand held computer may be more convenient for participants thus allowing them to manage data more effectively and could lead to progress in PMS research.

In conclusion, many women experience PMS symptoms that interfere with personal relationship, social activities, and job performance and the cause of the PMS remains unknown, the best way to conquer PMS is by understanding the symptoms and taking action to alleviate them (Temple, 2001). Enhancing the knowledge of PMS in nursing research will increase the nurse's practical capabilities and nurse can identify the PMS women and deal with their complex problems resulting from PMS. The first step of PMS issues should be the scientific and rigorous symptom assessment, it is critical to collect a daily diary of symptoms over the course of at least one menstruation cycle for the accurate assessment.

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