- Trabajo realizado por el equipo de la Biblioteca Digital de la Fundación Universitaria San Pablo-CEU
- Me comprometo a utilizar esta copia privada sin finalidad lucrativa, para fines de investigación y docencia, de acuerdo con el art. 37 del T.R.L.P.I. (Texto Refundido de la Ley de Propiedad Intelectual del 12 abril 1996)

Behav. Res. Ther. Vol. 24, No. 5, pp. 547–551, 1986
Printed in Great Britain

0005-7967/86 $3.00 + 0.00
Pergamon Journals Ltd

ASSESSMENT OF DYSMENORRHEA USING THE MENSTRUAL SYMPTOM QUESTIONNAIRE: FACTOR STRUCTURE AND VALIDITY

BETH G. WILDMAN and PAMELA A. WHITE
Department of Psychology, Kent State University, Kent, OH 44242, U.S.A.

(*Received 27 January 1986*)

Summary—Painful menstruation has been estimated to affect up to 75% of women between the ages of 17 and 25 yr, yet relatively little research has been conducted on its assessment. The present study examined the factor structure and validity of the Menstrual Symptom Questionnaire (MSQ), one of the few instruments available for the assessment of dysmenorrhea. Results supported previous studies which suggested that a dichotomous classification of menstrual experience into spasmodic and congestive types was an oversimplified conceptualization of an apparently much more complex problem. A factor analysis of the MSQ resulted in three factors, premenstrual symptoms, psychophysiological discomfort and menstrual pain. The results of the present research suggest that the factor structure of the MSQ may be reactive to the population on which it is used, in a way that reflects the developmental course of dysmenorrhea.

INTRODUCTION

Primary dysmenorrhea, or painful menstruation in the absence of known organic pathology has been said to be the greatest single cause of missed work and school among women (Andersch and Milsom, 1982; Dawood, 1983; Klein, Litt, Rosenberg and Udall, 1981). Estimates suggest that approx. 25–75% of females between the ages of 17 and 25 yr experience dysmenorrhea (Coppen and Kessel, 1963; Klein and Litt, 1981; Weideger, 1976; Woods, Most and Dery, 1982). Variability in the estimates of the extent of dysmenorrhea is likely to be due to differences in the populations studied and the lack of an adequate assessment procedure.

The diversity of symptoms and the presence of social pressures and stereotypes about menstruation render traditional approaches to pain assessment inadequate for the assessment of dysmenorrhea. However, as with most pain experiences, dysmenorrhea is a private event and therefore approaches to its assessment have relied primarily on self-report measures, such as the Menstrual Symptom Questionnaire (MSQ; Chesney and Tasto, 1975). The MSQ was designed by Chesney and Tasto (1975) in order to distinguish between the two types of dysmenorrhea proposed by Dalton (1969), spasmodic and congestive dysmenorrhea.

Research concerned with the validity of the MSQ has consistently repudiated the validity of the dichotomy between spasmodic and congestive dysmenorrhea. Webster, Martin, Uchalik and Gannon (1979) suggested that a double-median split method of scoring the MSQ and a modification of its last question, which asks women to indicate whether their menstrual experience is primarily spasmodic or congestive in nature, to include the options of 'both' or 'neither' might make the MSQ more useful. Nelson, Sigmon, Amodei and Jarrett (1984) failed to validate this alternative scoring method.

Nelson *et al.* (1984) discussed the importance of identifying symptom clusters in order to aid in the development and evaluation of effective treatment interventions for dysmenorrhea. Alternatives to the MSQ that have been suggested use many of the same symptom items as the MSQ (e.g. Cox, 1983; Nelson *et al.*, 1984).

The present study attempted to extend the findings of Nelson *et al.* (1984) by further attempting to examine the validity of dichotomous scaling of the MSQ and to determine if useful symptom clusters could empirically be derived from the MSQ.

METHOD

Subjects

Four hundred and twenty female undergraduate psychology students completed questionnaires about their menstrual experience, attitudes and history. In order to decrease the likelihood of

including women with premenstrual syndrome, and attempt to include women most at risk for primary dysmenorrhea, the final *S* sample was restricted to women between the ages of 17 and 25 yr who were unlikely to be experiencing secondary dysmenorrhea (i.e. discomfort with organic etiology). Women who reported the onset of menstrual discomfort more than 3 yr after the onset of menarche were eliminated from the final *S* sample to prevent inclusion of women with organic etiology. Additionally, the 8 women who failed to complete Item 25 were also eliminated. The final sample size upon which all analyses were performed was 302.

Instruments

Modified Menstrual Symptom Questionnaire (MSQ-M). The MSQ-M contained the 24 symptom descriptions of the MSQ and a 25th item for which *S*s were asked which best described their menstrual experience: descriptions of spasmodic or congestive symptoms, 'neither' or 'both'.

The instructions for completing the MSQ-M were modified according to Stephenson, Denney and Aberger's (1983) suggestion that *S*s should be instructed to respond in reference to their most recent menstrual cycle, rather than on the basis of their overall menstrual experience (Chesney and Tasto 1975).

Biographical and menstrual history. *S*s were also required to complete a series of questions about demographics and their menstrual history and experience.

RESULTS

The mean age of the *S*s was 18.8 yr (median = 18.6 yr). *S*s' responses to a question concerning their menstrual pain ranged from 'no' (1) to 'yes, often incapacitating' (5). The mean and median response was 2.7, with only 14.2% of the *S*s reporting experiencing no pain during their menstrual periods; 54% of the women reported experiencing menstrual pain that was bothersome or worse.

A double-median split was performed on the spasmodic and congestive scales, similar to the procedures used by Nelson *et al.* (1984), using the median as the cutoff on both scales. A χ^2-analysis was performed comparing *S*s' responses on Item 25 of the MSQ-M with how they were classified based on the double-median split procedure. This analysis indicated that these two methods of classification yielded significantly different distributions of women ($\chi^2 = 89.78$, $P < 0.001$). Table 1 compares responses to Item 25 with the double-median split of the MSQ. The correlation between these distributions was $r = -0.03$.

In order to ascertain whether the individual items of the MSQ were related to how women classified their menstrual experience on Item 25, a discriminant function analysis was performed. The discriminant functions classified 56.6% of the women correctly, compared to a chance rate of 25%. Table 2 contains the distributions based upon the discriminant functions vs how *S*s classified themselves.

In order to derive symptom clusters, a principal-axis factor analysis followed by a Varimax rotation was performed on the 24 items of the MSQ (Chesney and Tasto, 1975). Six factors with eigenvalues >1.0 prior to rotation emerged. Attempts to interpret these factors resulted in unstable factors, that is, factors which contained only one or two saliently loaded items.

Further factor analyses, as recommended by Gorsuch (1983) were performed. The number of factors extracted was systematically reduced by one until only stable factors were obtained. In order

Table 1. Frequency of self-classifications and classifications based on the MSQ

Self-classified group	*n*		Classifications based on the MSQ S	C	N	B
S	100	*n*	21	5	23	51
		%	21.0	5.0	23.0	51.0
C	84	*n*	1	16	36	31
		%	1.2	19.0	42.9	36.9
N	76	*n*	2	9	57	8
		%	2.6	11.0	75.0	10.5
B	42	*n*	7	6	7	22
		%	16.7	14.3	16.7	52.4

S = spasmodic, C = congestive, N = neither, B = both.

Table 2. Frequency of self-classifications and classifications based on discriminate functions

Self-classified group	*n*		Predicted group membership S	C	N	B
S	100	*n*	57	11	22	10
		%	57.0	11.0	22.0	10.0
C	84	*n*	9	38	15	22
		%	10.7	45.2	17.9	26.2
N	76	*n*	6	13	52	5
		%	7.9	17.1	68.4	6.6
B	42	*n*	10	8	0	24
		%	23.8	19.0	0.0	57.1

Abbreviations as in Table 1.

Table 3. Factor loadings of the MSQ

	Item	Factor 1 Premenstrual	Factor 2 Discomfort	Factor 3 Pain
1.	Irritable, days before (C)	0.60*	0.43	0.04
2.	Cramps begin first day (S)	0.14	0.43	0.56*
3.	Depressed days before (C)	0.65*	0.44	−0.00
4.	Abdominal pain one day before (S)	0.42	0.28	0.28
5.	Exhausted or lethargic before (C)	0.61*	0.35	0.08
6.	Know only by looking at the calendar (S)	−0.28	0.05	−0.10
7.	Prescription drugs for pain during (S)	0.04	0.48*	0.06
8.	Weak and dizzy during (S)	0.29	0.68*	0.24
9.	Tense and nervous during (C)	0.36	0.57*	0.11
10.	Diarrhea during (S)	0.17	0.40	0.24
11.	Backaches before (C)	0.47*	0.24	0.27
12.	Aspirin for pain during (S)	0.24	0.08	0.49*
13.	Breasts tender before (C)	0.43	0.10	0.17
14.	Lower back and abdomen tender day 1 (S)	0.32	0.26	0.49*
15.	Feel like curling up day 1 (S)	0.04	0.51*	0.41
16.	Gain weight before (C)	0.52*	0.10	0.20
17.	Constipated during (C)	0.23	0.19	0.25
18.	Reappearing pains day 1 (S)	0.18	0.29	0.40
19.	Dull aching during (C)	0.09	0.03	0.49*
20.	Abdominal discomfort before (C)	0.55*	0.14	0.21
21.	Backaches with period (S)	0.34	0.29	0.43
22.	Abdomen feels bloated before (C)	0.63*	0.15	0.24
23.	Nauseous during (C)	0.23	0.52*	0.35
24.	Headaches before (S)	0.47	0.40	0.18

S = spasmodic symptom, C = congestive symptom.
*Considered to be salient on factor.

for an item to be considered salient on a factor, the item needed to obtain a factor loading of at least 0.45 and have a value at least 0.10 greater than its loading on any other factor. A three-factor solution was most satisfactory. The first factor loaded on items related to premenstrual symptoms and accounted for 32.1% of the variance. The second factor, which accounted for 7.0% of the variance, loaded on items related to menstrual pain and the use of aspirin for pain during menstruation. The third factor accounted for 5.8% of the variance and loaded on items related to psychophysiological discomfort, such as feeling weak and dizzy, nauseous and the use of prescription medication during menstruation. Table 3 contains the factor loadings for the MSQ.

An additional factor analysis was performed on all of the women who had completed the questionnaires, including those who had been eliminated due to age, pregnancy or menstrual history. The inclusion of these women resulted in a sample size of 412 and yielded a factor structure similar to that obtained from the previous, more restricted sample. The third factor, which loaded on items related to menstrual pain was weakened and only loaded saliently on one item, while one additional item approached the criterion for salient loading. A two-factor solution was attempted on this population and the resulting factors were not readily interpretable. Therefore, the three-factor solution appears most appropriate for this group as well, with interpretation limited to the premenstrual and discomfort factors.

An additional discriminant function analysis was performed in order to ascertain whether membership in the four self-classified groups could be predicted by *S*'s scores on the three factors. These discriminant functions were able to classify 44.7% of the women correctly, compared with a chance rate of 25%. ANOVAs of whether *S*s scored differently on each of the three factors were significant [$F(3,298) = 8.28$, $P < 0.001$; $F(3,298) = 21.21$, $P < 0.001$; $F(3,298) = 31.46$, $P < 0.001$; for Factors 1, 2 and 3, respectively].

DISCUSSION

The results of the present study confirm previous findings that dysmenorrhea remains a pervasive problem which affects the majority of females between the ages of 17 and 25 yr (Coppen and Kessel, 1963; Klein and Litt, 1981; Weideger, 1976; Woods *et al.*, 1982) in spite of the availability of both prescription and nonprescription pain relievers specifically targeted for menstrual symptoms.

Attempts to validate dichotomous scaling of the MSQ into spasmodic and congestive scales replicated the results of Nelson *et al.* (1984). That is, all attempts to affirm the validity of these

concepts of dysmenorrhea failed. Even the discriminate function analysis which attempted to find the best predictors for each classification without regard to theoretical notions about which scale each item should be assigned to failed to adequately predict self-classifications.

The present study extended the findings of Nelson *et al.* (1984) by following their recommendation for the need to discern useful symptom clusters for the assessment of dysmenorrhea. The results of the factor analyses suggest that useful symptom clusters may be derived from the MSQ. Contrary to the findings of Stephenson *et al.* (1983) and Webster *et al.* (1979) where weak and unstable factors were obtained, the present analyses followed the procedures suggested by Gorsuch (1984) and obtained interpretable and potentially useful factors related to symptomatology as well as to when during the menstrual cycle the symptoms are experienced.

A review of the factor loadings reported by Stephenson *et al.* (1983) suggests that differences in results are likely to be due to differences in how the factor analyses were performed and interpreted. When the criteria for salient loading on a factor utilized in the present research were anecdotally applied to the data of Stephenson *et al.*, the two factors that remained consistent across their samples resembled the premenstrual and menstrual pain factors obtained in the present investigation. A factor similar to the psychophysiological discomfort factor in the present research was also among the factors.

When the sample was restricted, the three-factor solution was most satisfactory. However, in the unrestricted sample, the pain factor was substantially weakened. Anecdotal analyses suggested that the addition of parous women and those above the age of 25 yr diluted the strength of the pain factor. These results suggest that the factor structure of the MSQ may be reactive to the population on which it is used and are compatible with previous literature on the developmental patterns associated with menstrual symptomatology. The population of women over the age of 25 yr and those who have experienced pregnancy have typically been considered to be at a reduced risk for menstrual pain, and at a higher risk than their younger and nonparous counterparts for premenstrual symptoms and menstrual discomfort (Friederich, 1983; Murray, 1981; Sturgis and Albright, 1940; Wilson and Kurzrok, 1938).

The factor structure obtained in the present study may also help account for some of the discrepancies that exist in the dysmenorrhea literature with regard to whether women who experience dysmenorrhea are more neurotic or less well-adjusted than their nondysmenorrheic peers, with some authors reporting a relationship between dysmenorrhea and neuroticism or psychogenic disorders (Coppen and Kessel, 1963; Stephenson *et al.*, 1983; Wittkower and Wilson, 1940), and others finding no such relationship (Iacono and Roberts, 1983). An examination of the items which loaded on the three factors suggests that if indeed these factors represent different groups of women, those women presenting with the symptoms which loaded on the discomfort factor, such as feeling weak, dizzy and nauseous during menstruation, and feeling tense and nervous before menstruation begins, may be among those women who have been perceived as neurotic. Interestingly, taking prescription medication also loaded on this factor, suggesting that these women may be more likely to appear in studies of clinical populations.

The present results support and extend the findings of Nelson *et al.* (1984), Stephenson *et al.* (1983) and Webster *et al.* (1979), which suggest that the descriptive paragraphs of the MSQ (Chesney and Tasto, 1975) are likely to be invalid, rather than most of the symptom items themselves. The present finding and that of Nelson *et al.* (1984) that a large proportion of women were classified as 'neither' or 'both' suggest that the four alternatives included in the MSQ-M were an improvement over the two choices provided by Chesney and Tasto (1975), however did not seem to reflect the symptom clusters that women reported experiencing. Perhaps descriptive paragraphs based upon the three factors obtained in the present factor analyses would be useful in future research. Such research should aim at validating symptom clusters which would selectively respond to different treatments (Nelson and Hayes, 1979).

Acknowledgement—The authors gratefully acknowledge the help and advice of Roy S. Lilly with the factor analyses. Requests for reprints should be addressed to B. G. Wildman.

REFERENCES

Andersch B. and Milsom I. (1982) An epidemiological study of young women with dysmenorrhea. *Am. J. Obstet. Gynec.* **144,** 655–660.

Chesney M. A. and Tasto D. L. (1975) The development of the Menstrual Symptom Questionnaire. *Behav. Res. Ther.* **13,** 237–244.
Coppen A. and Kessel N. (1963) Menstruation and personality. *Br. J. Psychiat.* **109,** 711–721.
Cox D. J. (1983) Menstrual symptoms in college students: a controlled study. *J. behav. Med.* **6,** 335–338.
Dalton K. (1969) *The Menstrual Cycle.* Pantheon, New York.
Dawood M. Y. (1983) Dysmenorrhea. *Clin. Obstet. Gynec.* **26,** 719–727.
Friederich M. A. (1983) Dysmenorrhea. *Women Hlth* **8,** 91–106.
Gorsuch R. L. (1983) *Factor Analysis,* 2nd edn. Erlbaum, Hillsdale, N. J.
Iacono C. U. and Roberts S. J. (1983) The dysmenorrhea personality: actuality or statistical artifact. *Soc. Sci. Med.* **17,** 1653–1655.
Klein J. R. and Litt I. F. (1981) Epidemiology of adolescent dysmenorrhea. *Pediatrics* **68,** 661–664.
Klein J. R., Litt I. F., Rosenberg A. and Udall L. (1981) The effect of aspirin on dysmenorrhea in adolescents. *J. Pediat.* **98,** 987–990.
Murray L. (1981) Dysmenorrhea: new theory, new therapy. *Sex. Med. Today* **Sept.,** 6–14.
Nelson R. O. and Hayes S. C. (1979) Some current dimensions of behavioral assessment. *Behavl Assess.* **1,** 1–16.
Nelson R. O., Sigmon S., Amodei N. and Jarrett R. B. (1984) The Menstrual Symptom Questionnaire: the validity of the distinction between spasmodic and congestive dysmenorrhea. *Behav. Res. Ther.* **22,** 611–614.
Stephenson L. A., Denney D. R. and Aberger E. W. (1983) Factor structure of the Menstrual Symptom Questionnaire: relationship to oral contraceptives, neuroticism and life stress. *Behav. Res. Ther.* **21,** 129–135.
Sturgis S. H. and Albright F. (1940) The mechanism of estrin therapy in the relief of dysmenorrhea. *Endocrinology* **26,** 68–72.
Webster S. K., Martin H. J., Uchalik D. and Gannon L. (1979) The Menstrual Symptom Questionnaire and spasmodic/congestive dysmenorrhea: measurement of an invalid construct. *J. behav. Med.* **2,** 1–19.
Weideger P. (1976) *Menstruation and Menopause: the Physiology and Psychology, the Myth and the Reality.* Knopf, New York.
Wilson L. and Kurzrok R. (1938) Studies on the motility of the human uterus *in vivo*: a functional myometrial cycle. *Endocrinology* **23,** 79–86.
Wittkower E. and Wilson A. T. M. (1940) Dysmenorrhea and sterility: personality studies. *Br. med. J.* **2,** 586–590.
Woods N. F., Most A. and Dery G. K. (1982) Prevalence of perimenstrual symptoms. *Am. J. publ. Hlth* **72,** 1257–1264.