

Work Loss Associated With Increased Menstrual Loss in the United States

Isabelle Côté, PhD, Philip Jacobs, DPhil, CMA, and David Cumming, MBChB

OBJECTIVE: To estimate the effect of increased menstrual flow on the loss of work.

METHODS: Heavy or otherwise abnormal menstrual bleeding is a common problem among women in the reproductive age range. Until now, there has been no evidence of its effect on absences from work. We used data from the National Health Interview Survey 1999, a personal interview household survey using a nationwide representative sample of the civilian noninstitutionalized population of the United States. Participants were 3133 women aged between 18 and 64 years who reported having a natural menstrual period in the last 12 months and in the last 3 months, never having taken medication containing estrogen (except past use of oral contraceptives), and never having been told that they had reproductive cancer. Analysis was performed using data from 2805 women, 373 having self-described heavy flow and 2432 having normal flow. The main outcome measure was work loss associated with the degree of menstrual flow.

RESULTS: Using binary logistic regression, age, marital status, education, family size, perception of health, and flow of menstrual periods are associated with work losses ($P < .05$). The odds ratio of 0.72 (95% confidence interval 0.56, 0.92) indicates that women who have a heavier flow are 72% as likely to be working as are women who have a lighter or normal flow.

CONCLUSION: Menstrual bleeding has significant economic implications for women in the workplace: work loss from increased blood flow is estimated to be \$1692 annually per woman. (Obstet Gynecol 2002;100:683-7. © 2002 by The American College of Obstetricians and Gynecologists.)

Heavy or otherwise abnormal menstrual bleeding is a common problem among women in the reproductive age range. More than 600,000 hysterectomies are performed yearly in the United States, a rate of 23.6 per 10,000 women.¹ Approximately 11% of hysterectomies performed in 1997 were for menstrual disorders.² The

largest single cited reason for hysterectomies was fibroids; it is likely that many of these were also assessed with abnormal bleeding, although there was no clear evidence of the relative frequencies of hysterectomies for symptomatic and nonsymptomatic fibroids. Endometrial ablation and a range of medical therapies have also been introduced^{3,4} and are used to treat a further population of women with menstrual problems.

One-tenth of women participating in a population study were found to have menstruation sufficient to place them at risk for developing anemia,⁵ whereas nearly one-third of all women consider their menstruation to be excessive.⁶ Heavy menstrual bleeding may be accompanied by pain and discomfort, cause significant social embarrassment, and have a substantial effect on health-related quality of life. There is evidence that this condition is associated with the direct use of health resources, primarily in terms of physician office visits and cost of surgical procedures.⁷ Five percent of women in the United Kingdom seek treatment for abnormal bleeding annually,⁸ and abnormal menstrual bleeding is one of the four most common reasons for women going to see a family physician.⁹

There have been no studies providing evidence of its effect on other aspects of resource use, such as absences from work; however, because abnormal menstrual loss primarily impacts women in the working-age group, and because it has substantial effects on health-related quality of life, it is plausible that there may be a substantial effect on women's employment. The purpose of this paper is to study the effect of heavy bleeding on the loss of employment among working women in the United States.

MATERIALS AND METHODS

We analyzed data from the National Health Interview Survey (NHIS) 1999, a personal interview household survey, using a nationwide representative sample of the civilian noninstitutionalized population of the United States.¹⁰ It contains questions on personal and demographic characteristics, injuries, impairment, medical conditions, and use of health resources. In the 1999

From the Institute of Health Economics; and Departments of Public Health Sciences, and Obstetrics and Gynecology, University of Alberta, Edmonton, Alberta, Canada.

release, additional questions related to female health issues such as menstrual cycles, menopause, and hormone replacement therapy were imbedded in the questionnaire developed for the adult sample. Individuals included in the present study were women aged between 18 and 64 years who reported having a natural menstrual period in the last 12 months and in the last 3 months, never having taken an estrogen-containing medication other than oral contraceptives, and never having been told by a health professional that they had reproductive cancer.

To evaluate the effect of the flow of the menstrual period on the employment status, we used binary logistic regression.¹¹ The interview question used to determine if a woman was in the labor force or not was the following: What were you doing last week? 1) Working at a job or business; 2) With a job or business but not at work; 3) Looking for a job; 4) Not working at a job or business; 5) Refused; 6) Don't know. Women who answered option 1 were considered to be currently at work (ie, working for pay), whereas women who answered between 2 and 6 were not considered to be actively at work.

The independent (study and control) variables were determined according to the theory of labor supply,¹²⁻¹⁴ which stipulates that the decision to work is influenced by factors such as sex, age, race, marital status, educational level, family size, and health status. The latter was measured using a self-reported question on perception of health status.

A dummy variable indicating the change in the women's menstrual flow (ie, heavier flow versus lighter to constant flow) was added to the analysis. The question used to categorize menstrual flow was: Compared to 12 months ago, is your menstrual flow lighter, about the same, heavier, more variable, or has it stopped? Women who answered "lighter" or "about the same" formed the "light to normal flow" group, whereas those who answered "heavier" formed the "heavy flow" group. Women for whom the answer was more variable, stopped, refused, or don't know were excluded.

Sample adult weights provided by the NHIS were applied to all statistical analyses to obtain 1999 population-based estimates. All analyses were performed using SPSS for Windows 11.0 (SPSS Inc., Chicago, IL).

RESULTS

In total, there were 30,801 individuals in the adult sample database (ie, 18 years or older), 17,599 of which were women. Among the 9020 women who reported having a natural menstrual period in the last 12 months, 8669 reported having a natural menstrual period in the last 3

months. Of these, 3160 had never taken medication containing estrogen, and within this subgroup, 3133 women had never been told by a health professional that they had reproductive cancer. In addition, 328 women were excluded from this group, five because they were more than 64 years and 323 because of the imprecision of their answer related to their menstrual flow. The characteristics of these excluded women were similar to those retained for analysis. Consequently, analysis was performed using data from 2805 women, 373 (13.3%) in the "heavy flow" group and 2432 (86.7%) in the "low/normal flow" group.

Characteristics of the study population are presented in Table 1. Compared with women having low/normal flow, those women having heavy flow were younger, less likely to be white, less educated, more likely to be single, and more likely to be in a family of more than two individuals. A total of 61.7% of women having heavy flow were working compared with 73.5% of those women having low/normal flow. In regard to perception of health, 55% of women having heavy flow rated their health as excellent or very good, whereas close to 70% of women having low/normal flow rated their health as excellent or very good.

In Table 2 are presented the results of our multivariate analysis, which includes factors potentially associated with working. All factors but race were significantly associated with working. Women aged 40 years or more as well as those women with more education were more likely to be working. Married women and those in a family of more than two individuals were less likely to be working. Related to perception of health, the lower was the perception of health, the less likely that the women were working. Lastly, women having a heavier flow of menstrual bleeding were less likely to be working than those women having a low/normal flow. The odds ratio of 0.72 indicates that women who have a heavier flow are 72% as likely to be working as are women who have a lighter or normal flow.

DISCUSSION

We applied an economic approach to the analysis of employment to study the impact of heavy menstrual bleeding using data from the NHIS. The results show that, on any given week, women who have increased uterine blood flow are 72% as likely to be at work as are women with lighter or steady menstruation. Taking the unadjusted employment rate for those with normal menstrual flow at 73.5%, then during a typical week, the above statistic translates into a 6.9% reduction in employment associated with heavier bleeding.

Our results do not provide an estimate of the duration

Table 1. Characteristics of Women With Natural Menstrual Period ($n = 2805$)

Characteristic	Having heavy flow ($n = 373$) n (%)	Having low/normal flow ($n = 2432$) n (%)
Age (y)		
18–39	114 (30.6)	485 (19.9)
40–49	237 (63.5)	1722 (70.8)
>49	22 (5.9)	225 (9.3)
Race		
White	258 (69.2)	1844 (75.8)
Other	115 (30.8)	588 (24.2)
Marital status		
Single	164 (44.0)	1019 (41.9)
Married/partner	209 (56.0)	1413 (58.1)
Highest level of education completed		
Less than high school	68 (18.2)	368 (15.1)
High school/certificate/technical	225 (60.3)	1370 (56.3)
BS, BA, or more	80 (21.4)	694 (28.5)
Family size		
1–2 individual(s)	152 (40.8)	1114 (45.8)
>2 individuals	221 (59.2)	1318 (54.2)
Perception of health		
Excellent	85 (22.8)	881 (36.2)
Very good	121 (32.4)	813 (33.4)
Good	111 (29.8)	556 (22.9)
Fair	40 (10.7)	149 (6.1)
Poor	16 (4.3)	32 (1.3)
Missing	0 (0.0)	1 (0.0)
Labor force participation		
In the labor force		
Working at a job or business	230 (61.7)	1788 (73.5)
Total	230 (61.7)	1788 (73.5)
Not in the labor force		
With a job or business but not at work	21 (5.6)	66 (2.7)
Looking for a job	12 (3.2)	40 (1.6)
Not working at a job or business	109 (29.2)	536 (22.0)
Refused	0 (0.0)	2 (0.1)
Not ascertained	1 (0.3)	0 (0.0)
Total	143 (38.3)	644 (26.5)

Data source: National Center for Health Statistics (2001).

Data are presented as percentages.

of nonparticipation in the labor force because of heavy bleeding, which is necessary to estimate the cost of lost work. However, using other data from the NHIS, we estimated that the average amount of time worked by nonbleeders was 9.2 months per year (approximately 36.8 weeks). Using our estimates, heavy bleeders would work 6.9%, or 3.6 weeks less per year. Average weekly compensation (wages plus benefits) for all women in the United States workforce in the year 2000 was \$470.^{15,16} Therefore, the expected value of lost wages associated with heavy bleeding is \$1692 (= \$470 × 3.6 weeks) annually per woman complaining of increased menstrual loss.

Our estimates are based on self-reported data from a first-time national survey of abnormal bleeding. Nonreporting of the condition is a possibility, though we imag-

ine that it is more likely that respondents will under-report rather than over-report because of the stigma associated with this condition. We should also point out that our measure of employment was one in which women were actually at paid work in the past week. This is a highly objective measure, but it does exclude unpaid work including work in the home. Heavy bleeding may also impact on unpaid work, but it would be much more difficult to isolate this phenomenon. Our preference, therefore, was to use an objective measure of active participation in the labor market.

The survey question regarding the occurrence of “heavy” bleeding is subject to variable interpretation. There are objective laboratory¹⁷ and nonlaboratory¹⁸ ways of defining and measuring the degree of menstrual blood loss, and it is recognized that such methods are

Table 2. Factors Associated With Being in the Labor Force (*n* = 2805)

Variables	OR*	95% CI
Age (y)		
18–39	Reference	
40–49	1.64	1.33, 2.02
>49	1.62	1.12, 2.33
Race		
White	Reference	
Other	1.10	0.89, 1.35
Marital status		
Single	Reference	
Married/partner	0.65	0.53, 0.79
Highest level of education completed		
Less than high school	Reference	
High school/certificate/technical	1.88	1.49, 2.38
BS, BA, or more	2.48	1.88, 3.28
Family size		
1–2 individual(s)	Reference	
>2 individuals	0.62	0.51, 0.75
Perception of health		
Excellent	Reference	
Very good	1.05	0.84, 1.31
Good	0.72	0.57, 0.91
Fair	0.34	0.24, 0.48
Poor	0.04	0.02, 0.10
Flow of menstrual period		
Low/normal	Reference	
Heavy	0.72	0.56, 0.92

OR = odds ratio; CI = confidence interval.

Data source: National Center for Health Statistics (2001).

* Odds ratios have been adjusted for the effect of all the parameters listed.

more accurate than the patient's self-reported history of her problem.^{19,20} In actual practice, such methods are rarely used, and assessment of blood loss in women complaining of heavy periods relies on self-reporting of symptoms. In the NHIS, the concept of a menstrual flow that is heavier than 1 year ago is used as the tool to determine abnormality. The use of this concept as a marker for menorrhagia is subjective but no more than the usual clinical tools to determine menorrhagia. It does suggest change in menstruation, which is sufficient to raise concern for the individual. In surveys such as the NHIS, that is, it would be difficult to incorporate a measure of heavy blood loss that would achieve a uniform agreement among respondents.

Another limitation of this study deals with the degree to which the sample is representative of the entire population. There are sectors of the population, which may be under-represented in the population, such as homeless persons. Such persons are less likely to work, but we do not know whether they are more or less likely to be heavy bleeders.

Our measure of work loss is a conservative one, in that we define the concept as the increased association between work loss and blood flow; that is, our measure is presented as a figure that is net of other contributing factors, rather than in terms of the total work loss for persons with heavy blood flow. In this context, heavier bleeding was shown to have a considerable impact on work loss. The economic loss from the reduction in employment is an economic cost of heavier blood flow that is in addition to the medical resources, which are used to treat the condition. When conducting assessments of the social impact of this condition, this added factor should be included.

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Address reprint requests to: David Cumming, MBChB, Royal Alexandra Hospital, 201 Community Services Centre, 10240 Kingsway Avenue, Edmonton, Alberta T5H 3V9, Canada; E-mail: dcumming@ualberta.ca.

Received January 16, 2002. Received in revised form March 11, 2002. Accepted April 11, 2002.



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