

Predictors of women's physical health problems after childbirth

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Abstract

The objectives of this study were to document the extent and the correlates of common physical health symptoms in women two months after childbirth. Of special interest was determining whether violence and depression histories increase the risk for experiencing these symptoms. Participants were recruited in six Toronto-area hospitals and were interviewed by telephone 8–10 weeks later. Two hundred of the 332 (60.2%) women who were approached completed the study. Most women (96%) reported at least one physical health symptom 2 months postnatally (Mean = 3.4, SD = 2.0). Stepwise logistic regression was conducted for each outcome. Antenatal depression was a significant predictor of excessive fatigue and bad headaches. Sick leave during pregnancy predicted postpartum backaches. Adult emotional abuse and household income were associated with bowel problems. Episiotomy, maternal complications, and planned pregnancy predicted perineal pain. Finally, being Canadian born and having an assisted vaginal delivery increased the risk for hemorrhoids while cesarean section decreased the risk. A high prevalence of physical symptoms was found in women after childbirth. History of depression and violence were implicated in the occurrence of some of these symptoms. Other important predictors included demographic, maternal, and delivery-related factors.

Keywords: *Postpartum period, abused women, postpartum depression, pregnancy complications*

Introduction

Most existing studies on women's physical health during the postpartum period have focussed on maternal mortality or major morbidity as the main outcome variables [1]. Consequently, maternal morbidity has narrowly been conceptualized as including rare, severe, and potentially life-threatening obstetric complications that arise during pregnancy, delivery, and the postpartum period. Less is known however, about the extent and the correlates of less serious (and possibly more prevalent) physical health symptoms that are meaningful to women following childbirth. The small emerging body of literature suggests that these less severe health problems are highly prevalent among postpartum women [2–7].

The relevance and timeliness of research focusing on these more common maternal health symptoms was underscored in a study by Kline and colleagues [8]. They convened a series of focus groups of new mothers and obstetrician clinicians (midwives, family practi-

tioners, obstetricians, and gynecologists) to identify women-centred maternal health outcomes for research. These outcomes represent indicators of health that are considered to be important to mothers. During the sessions, mothers were asked to discuss how pregnancy and childbirth had affected their health. Clinicians were asked to discuss what they considered were important maternal health outcomes. Both mother and clinician groups expressed dissatisfaction with the paucity of available information concerning women's postpartum health. Women reported feeling unprepared for the health consequences of childbirth and clinicians felt that the lack of information hindered their ability to adequately counsel women.

With respect to the risk factors for a difficult postpartum recovery, many studies have focused on obstetric or medical factors. There is a paucity of studies that have considered the relevance of women's psychosocial histories to their postnatal well-being. Two specific factors that have not been examined are women's histories of violence and depression.

Violence and physical health

A substantial body of literature has documented the pernicious health effects of interpersonal violence. General population surveys suggest that the lifetime prevalence of violence against women and female children to be significant. With respect to violence experienced during adulthood, results from Statistics Canada's 1993 Violence Against Women Survey (VAWS) [9] suggest that approximately one in two (51%) women has experienced at least one episode of physical or sexual assault since the age of 16, and 10% have been assaulted in the year preceding the survey. In the study, the lifetime prevalence of sexual and physical assault was 39% and 34%, respectively. With respect to child abuse, the 1990–1991 Ontario Mental Health Supplement (OHSUP) [10] surveyed close to 10,000 men and women 15 years of age or greater and found that the lifetime prevalence of child physical abuse was 31.2% in men and 21.1% in women, while the prevalence of child sexual abuse was 4.3% and 12.8% in men and women, respectively.

Although the psychological health effects of violence have been well studied, researchers have only recently begun to explore the physical sequelae of violence. Beyond the acute physical consequences of physical and sexual violence, interpersonal violence has been linked to the reporting of more physical health symptoms, medical problems, poorer self-rated health, poorer functional ability [11–14], and increased use of the health care system [15].

Depression and physical health

The relationship between depression and physical health has also been well established. Individuals with a clinical diagnosis of depression or who experience lower-grade depressive symptoms are more likely to report various somatic complaints, chronic medical problems, and poorer self-rated health than are non-depressed individuals [16–19]. Depressed individuals have also been found to have more functional disability [19] and to have more frequent use of the health care system [20] than non-depressed individuals. Based on the results of an international study of primary care patients that examined the relationship between depression and somatic symptoms, the authors concluded that 'somatic symptoms are a core component of the depressive syndrome' (p. 1333) [17].

Lacking from the literature are studies that explore the relationship between women's histories of violence and depression and their postpartum physical health specifically. Thus, the objectives of this study were three-fold: 1) to determine the prevalence of common health problems in women two months after childbirth, 2) to determine whether women's histories of violence and depression are associated with these health problems, and 3) to identify any

other risk factors for these symptoms including sociodemographic characteristics, maternal and delivery factors, and other psychosocial characteristics.

Methods

Ethics approval was first obtained from the University of Toronto and the six participating hospitals. The hospitals were located in the Greater Toronto Area (GTA) and consisted of three teaching hospitals and three large community hospitals. These hospitals were selected, in part, because they had a large number of deliveries and serviced a wide range of socioeconomic and ethnic groups.

Eligible women were recruited on the postpartum ward the day after delivery. The inclusion criteria were: being at least 18 years of age, able to understand and speak English, having a full-term singleton infant, not giving the baby up for adoption, and providing informed consent. The exclusion criteria were: being under 18 years of age, unable to speak English, giving the baby up for adoption, having a multiple birth, a premature delivery, an infant with a congenital illness or requiring the use of the neonatal intensive care unit. Women who could not be easily contacted by telephone for the postpartum interview were also excluded.

Two female research assistants, who were hired to work on this study, identified eligible women with the assistance of the postpartum ward staff. The research assistants approached eligible women individually and invited them to take part in a study on women's health after childbirth. Although women were not specifically told that they would be questioned about their experiences of depression, violence, or their postpartum physical health, they were informed that the interview might contain some sensitive questions.

Those who consented to participate were administered a brief socioeconomic survey in the hospital. Women were also asked permission to review their medical records to obtain information about their pregnancy and delivery. Finally, women were contacted 8–10 weeks later by telephone to set up a convenient time for the telephone interview to take place in private. Interviews lasted between 25 and 30 minutes. Up to eight calls were attempted. The interviews were conducted by four trained female research assistants. Although the interviewers were not trained to offer counseling to women, a referral protocol was arranged in the event that women wished to seek counseling services.

Instruments

Postpartum physical symptoms. The prevalence of 13 common physical health symptoms experienced by women after childbirth was assessed in the telephone interview. These items are based on items used in a study of Australian women [2]. The research assistant read the symptoms and participants indi-

cated whether any had been problematic for them at any time following the birth. Women were also asked to report any other health-related problems that they had experienced. The list of symptoms is displayed in Table II.

History of violence. We assessed emotional, sexual, and physical violence experienced as a child (under 14 years) or as an adult (over 14 years). Because one of the objectives of the larger study was to compare the various violence instruments, participants received one of two versions of the questionnaires. Details of the methods have been presented elsewhere [21]. In brief, for version 1, women from the first three hospitals were administered a modified version of the Conflict Tactics Scales (CTS2) [22] to assess for adult physical (physical assault scale and injury scale) and sexual violence (sexual coercion scale). Emotional abuse was determined using a subset of items from the Psychological Maltreatment of Women Inventory (PMWI) [23]. For version 2, women recruited from the last three hospitals were administered the Abuse Assessment Screen (AAS) [24] to assess for adult physical and sexual violence. Emotional abuse was assessed using the emotional abuse and control questionnaire from Statistics Canada's 1993 Violence Against Women Survey (VAWS) [9].

Childhood sexual abuse was assessed with one question asking about any unwanted sexual experiences, and childhood physical abuse was assessed with one item asking whether they had been hit or punched and left with bruises, cuts or bleeding. Childhood emotional abuse was determined with one item asking about emotional neglect experienced as a child.

Women were identified as positive for a physical, sexual, and emotional abuse if at least one item was endorsed from the relevant subscale, with the exception of adult emotional abuse. Women receiving version 1 were classified as emotionally abused if they indicated 'sometimes', 'often', or 'very often' to three or more of the items from the PMWI, while women receiving version 2 were classified as abused if they had answered 'yes' to at least three of the items.

History of depression. History of depression was assessed using two self-report questions, which were created for the study: 1) 'Prior to this pregnancy did you ever suffer from depression?', and 2) 'Were you depressed during this pregnancy?'.

Other possible risk factors. Other factors that were examined include: sociodemographic characteristics, psychosocial factors (e.g., support after the birth such as help with housework, panic attacks during pregnancy, traumatic life events), and maternal and delivery factors (e.g., mode of delivery, perineal trauma, birthweight, maternal complications from the birth)

Analysis

All statistical analyses were conducted using SAS, version 8.02. Univariate statistics were used to determine the distribution of the independent and dependent variables. Wald chi-square tests were used to ascertain the crude association between the possible risk factors and six postpartum symptoms (bad headaches, backaches, perineal pain, hemorrhoids, excessive fatigue, bowel problems). Factors that were associated with the symptom at $p < 0.15$ were screened for possible inclusion in the multivariable analysis. Also, child emotional abuse was excluded as a potential risk factor because of the small number of cases (7/200).

The extent of multicollinearity was then assessed by running chi-square tests for each pair of independent variables. When two variables were strongly associated with one another, the variable that demonstrated the weaker relationship with the outcome variable was excluded. Forward and backwards stepwise logistic regression models were then run for each postpartum symptom by including the screened variables. The 'best-fitting' model was selected based on a comparison of the regression diagnostics (Hosmer and Lemeshow Goodness-of-Fit Test, $-2 \log$ likelihood, Wald chisquare test, c-statistic). A final model was derived for each outcome by 'forcing in' the variables that were significant in the stepwise regression analysis.

Results

Response rates

During the recruitment phase of the study, 730 women delivered at the six hospitals, of whom 530 (72.6%) met the eligibility criteria. The researcher nurses approached 332 of the eligible women and 253 (76.2%) of them agreed to participate. Postpartum telephone interviews were completed by 200 women. The response fraction for eligible women who were approached was 60.2% (200/332).

Characteristics of the sample

Participants ranged in age from 19 to 42 years (Mean = 31.7 years; SD = 5.0 years) (Table I). The ethnic mix of the sample was reflective of Toronto; just over half (58.0%) of respondents indicated that Canada was their country of birth while the remaining was diverse in their backgrounds. With respect to income, 13.4% of women reported a total household income of less than \$32,000 per year (Statistics Canada's low-income cutoff for a family of four living in Toronto, 1996) and 43.3% reported an income of greater than \$80,000. All of the women in the study had a minimum of a high school education, and just

Table I. Characteristics of the sample.

Characteristics	No (%) of Participants (N = 200)*
Sociodemographic	
Age (years)	
19–29	57 (28.3)
30–34	78 (41.5)
35–42	53 (28.2)
<i>(Mean age = 31.7 years; SD = 5.0)</i>	
Combined household income**	
≤ \$32,000†	25 (13.4)
> \$32,000 – \$80,000	81 (43.3)
> \$80,000	81 (43.3)
Education	
High school	49 (24.5)
Technical or community college	48 (24.0)
University	103 (51.5)
Employment status in last 12 months	
Employed (full or part-time)	159 (79.5)
Homemaker	25 (12.5)
Other	16 (8.0)
Married, common law, partner	194 (97.0)
Born in Canada	116 (58.0)
Obstetric/Delivery Characteristics	
Nulliparous	99 (52.1)
Pregnancy not planned	55 (27.5)
Mode of delivery	
Spontaneous	97 (51.1)
Assisted vaginal delivery	36 (18.9)
Caesarean section	57 (30.0)
Perineal Trauma (1st–4th degree)	74 (40.4)
Episiotomy	41 (21.8)
Regional epidural or spinal	148 (79.6)

*Variables with missing data will have fewer than 200 respondents.

**Combined household income before taxes in 1999 in Canadian currency. †\$32,000 was approximately Statistics Canada's 1996 low-income cutoff for a family of 4 living in Toronto.

over half (51.5%) had a university degree. Most (79.5%) were employed in the year prior to the birth. Almost all of the women (97.0%) were either married, in a common-law relationship, or had a current partner. Just over half of the women were nulliparous (52.1%). With respect to mode of delivery, half of the women had a spontaneous delivery (51.1%), 18.9% had an assisted vaginal delivery, and 30.0% had a cesarean section. Finally, 40.4% had some degree of perineal trauma, 21.8% had an episiotomy, and 79.6% had an epidural anaesthesia.

Compared to responders, non-responders were more likely to be in the lowest income group (31.7% vs 13.4%, $p = 0.003$), to have a high school education or less (47.2% vs 24.5%, $p = 0.001$), to be single (17.0% vs 3.0%, $p = 0.001$), and were less likely to be born in Canada (37.0% vs 58.0%, $p = 0.01$). Non-responders also had significantly shorter labors (5.4 vs 8.8 hours; $t_{176} = 2.92$, $p = 0.004$) and were less likely to have been induced (12.8% vs 28.0%, $p = 0.05$). The groups were comparable on all other sociodemographic and obstetric characteristics.

Prevalence of postpartum physical symptoms, violence, and depression

Almost all of the women in the study (96.0%) reported at least one physical health symptom since the birth (Mean = 3.4; SD = 2.0) (Table II). The majority of women (62.5%) reported between two and five symptoms. The most frequently cited symptoms were being excessively tired or fatigued (55.0%), backache (54.5%), sore or cracked nipples (52.4%), perineal pain (45.9%), and hemorrhoids (35.5%). Approximately one in four women also reported bowel problems (26.5%) and headaches (23.0%).

With respect to women's experiences of violence, about 14% of women reported childhood sexual abuse, 13% reported sexual violence as an adult, and 29.6% reported emotional abuse as an adult. Physical abuse as a child (6.5%), physical abuse as an adult (6.5%), and child emotional abuse (3.5%) were reported by a smaller proportion of women. In terms of women's depression histories, 22.7% reported a depression prior to their pregnancy and 16.6% reported being depressed during their most recent pregnancy.

Headache

The results of the chisquare analysis indicated that depression during pregnancy was the only variable

Table II. Prevalence of postpartum symptoms (8–10 weeks after childbirth), history of violence and depression.

Postpartum physical symptom	No (%) of Participants (N = 200)*
Excessively tired or fatigued	110 (55.0)
Backaches	109 (54.5)
Sore or cracked nipples**	98 (52.4)
Perineal pain†	61 (45.9)
Hemorrhoids	71 (35.5)
Bowel problems (e.g., excessive or unusual diarrhea or constipation)	53 (26.5)
Bad headaches	46 (23.0)
Bladder problems	28 (14.0)
Red or tender breasts or mastitis**	22 (11.7)
More coughs or colds than usual	14 (7.0)
Sexual problems	12 (6.0)
Problems with birth control	11 (5.5)
History of Violence	
Childhood sexual abuse	28 (14.1)
Childhood physical abuse	13 (6.5)
Child emotional abuse	7 (3.5)
Adult sexual abuse	26 (13.0)
Adult physical abuse	13 (6.5)
Adult emotional abuse	59 (29.6)
History of Depression	
Depression prior to pregnancy	45 (22.7)
Depression during this pregnancy	33 (16.6)

*Variables with missing data will have fewer than 200 respondents.

**Includes women who breastfed for any period of time after the birth. †Includes women who gave birth vaginally; excludes women who had a cesarean section.

Table III. Results of the bivariate chisquare (unadjusted) and stepwise regression (adjusted) analysis. Odds ratios and 95% confidence intervals for the risk of headaches and backaches.

Characteristics	Bad Headaches		Backaches	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Sociodemographic				
Age (years)				
19–29	1.00		1.00	
30–34	1.25 (0.56–2.76)		1.54 (0.77–3.08)	
35–42	0.79 (0.31–1.99)		0.93 (0.44–1.96)	
Household income (Can.)				
< \$32,000 [‡]	1.03 (0.36–2.95)		0.45 (0.18–1.14) [†]	
\$32,000–\$80,000	1.00 (0.48–2.07)		1.11 (0.59–2.06)	
> \$80,000	1.00		1.00	
Education				
High school or less	1.13 (0.52–2.45)		1.03 (0.52–2.03)	
Technical/community college	0.62 (0.26–1.51)		1.38 (0.69–2.78)	
University				
Born in Canada	0.66 (0.34–1.27)		0.83 (0.47–1.46)	
Employed in past 12 months	0.77 (0.35–1.69)		0.81 (0.41–1.63)	
Maternal/Obstetric				
Nulliparous	1.01 (0.51–1.98)		0.87 (0.49–1.54)	
Sick leave during pregnancy	1.63 (0.68–3.88)		2.48 (1.04–5.90)**	2.48 (1.04–5.90)**
Labor 12 hrs or more	0.97 (0.41–2.28)		1.38 (0.65–2.92)	
Mode of delivery				
Spontaneous	1.00		1.00	
Assisted delivery	0.99 (0.38–2.60)			
Caesarean section	1.90 (0.90–4.01)		1.25 (0.65–2.42)	
Maternal complications [§]	1.03 (0.52–2.03)		2.08 (1.14–3.77)**	
Perineal Trauma (1st–4th degree)	0.64 (0.31–1.32)		0.72 (0.40–1.30)	
Episiotomy	0.75 (0.32–1.76)		0.97 (0.48–1.94)	
Regional epidural or spinal	0.89 (0.37–2.17)		1.53 (0.71–3.29)	
Birthweight 4000g or more	1.42 (0.60–3.34)		0.96 (0.45–2.06)	
Psychosocial				
2/more traumatic life events	1.91 (0.87–4.21) [†]		1.21 (0.58–2.51)	
Pregnancy not planned	1.38 (0.68–2.82)		1.11 (0.59–2.07)	
Panic attacks during pregnancy	1.53 (0.65–3.62)		1.84 (0.81–4.17) [†]	
No help with housework (after birth)	1.01 (0.48–2.13)		1.19 (0.63–2.25)	
Smoker	0.72 (0.23–2.24)		1.23 (0.50–3.03)	
History of Depression				
Depression prior to pregnancy	1.71 (0.81–3.59)		0.66 (0.34–1.29)	
Depression during pregnancy	2.62 (1.18–5.80)**	2.62 (1.18–5.80)**	1.86 (0.85–4.08) [†]	
History of Violence				
Child sexual abuse	1.40 (0.57–3.43)		2.36 (0.98–5.65)**	
Child physical abuse	1.00 (0.26–3.82)		0.97 (0.31–3.00)	
Adult sexual abuse	1.59 (0.64–3.94)		1.16 (0.50–2.67)	
Adult physical abuse	1.53 (0.45–5.23)		1.36 (0.43–4.32)	
Adult emotional abuse	1.76 (0.88–3.51) [†]		1.63 (0.88–3.05) [†]	

* $p < 0.01$, ** $p < 0.05$, $†p < 0.15$. [‡]\$32,000 was approximately Statistics Canada's 1996 low-income cutoff for a family of 4 living in Toronto. [§]Includes 1/more of the following problems from the birth: retained placenta, heavy bleeding, seizure, infection of the uterus, blood clots in leg, problems with episiotomy/scar, pneumonia, urinary tract infection.

that was significantly associated with bad headaches ($p < 0.05$) (Table III). Women reporting depression had 2.62 times the odds of reporting bad headaches postnatally than women not reporting depression (95% CI: 1.18–5.80). In the stepwise regression analysis, adult emotional abuse and having two or more traumatic life events were also added ($p < 0.15$). However, depression during pregnancy was the only independent predictor of bad headaches.

Given that depression is common among those with a history of interpersonal violence, the variable 'depression during pregnancy' may be a mediating variable between adult emotional abuse and headache. In fact, women who reported a history of adult

emotional abuse were significantly more likely than women without such a history to have indicated that they were depressed during their pregnancy (OR = 2.76; 95% CI = 1.28–5.94). We therefore reran the stepwise model, excluding antenatal depression as a covariate. When this was done, no variables were independently associated with headaches. Thus, depression during pregnancy remained the sole predictor of postpartum headaches.

Backache

In the bivariate analysis, the following variables were significantly associated with backaches: taking sick

leave during pregnancy on doctor's orders (OR = 2.48; 95% CI = 1.04–5.90), one or more maternal complications from the birth (OR = 2.08; 95% CI = 1.14–3.77), and child sexual abuse (OR = 2.36; 95% CI = 0.98–5.65) (Table III). In the stepwise regression model, we also added household income, panic attacks during pregnancy, depression during pregnancy, and adult emotional abuse. The results of the stepwise model showed that taking sick leave during pregnancy was the only independent predictor of postpartum backache. Because adult emotional abuse and antenatal depression were considered as potential covariates, a second stepwise model was run removing depression during pregnancy as a covariate. However, sick leave during pregnancy remained the only independent predictor of backache.

Perineal pain

The analysis for perineal pain was restricted to women who gave birth vaginally; women who delivered by cesarean section were excluded. In the crude analysis, the variables that were significantly associated with an increased risk of perineal pain were assisted vaginal delivery (OR = 3.85; 95% CI = 1.70–8.74), episiotomy (OR = 4.38; 95% CI = 1.97–9.74), and epidural analgesia (OR = 2.93; 95% CI = 1.19–7.26) (Table IV). Also, women who did not plan their pregnancy had a lower risk of perineal pain than women who planned their pregnancy (OR = 0.31; 95% CI = 0.13–0.70) and women who did not smoke had a lower risk of perineal pain than those who did (OR = 0.26; 95% CI = 0.07–0.96). Because assisted vaginal delivery and episiotomy were highly associated, we excluded assisted vaginal delivery from the stepwise model. Household income, parity, maternal complications, and panic attacks during pregnancy were also added to the stepwise regression model. The multivariate analysis revealed that maternal complications, episiotomy, and not having planned a pregnancy were independently associated with perineal pain after the birth. The strongest predictor was having had an episiotomy (OR = 4.74; 95% CI = 2.00–11.24). Also, women reporting maternal complications from the birth had 2.64 times the odds of perineal pain as women not reporting complications (95% CI = 1.15–6.08), and women who did not plan their pregnancy had a 72% lower odds of perineal pain than women who planned their pregnancy (OR = 0.28; 95% CI = 0.12–0.68).

Hemorrhoids

The variables that were significantly associated with hemorrhoids in the bivariate analysis were: being Canadian born (OR = 1.87; 95% CI = 1.02–3.43), perineal trauma (OR = 1.94; 95% CI = 1.05–3.59), and episiotomy (OR = 2.31; 95% CI = 1.14–4.66)

(Table IV). Type of birth was also statistically significant: compared to a spontaneous vaginal delivery, assisted vaginal delivery was associated with an increased risk of hemorrhoids (OR = 2.66; 95% CI = 1.21–5.85) while cesarean section was associated with decreased risk (OR = 0.36; 95% CI = 0.16–0.80). For the stepwise regression analysis, perineal trauma was excluded in favor of episiotomy. The following variables were also added: high school education, length of labor 12 hours or more, maternal complications, reporting two or more traumatic life events, and no help with housework. The results of the multivariate analysis showed that being Canadian born (OR = 1.93; 95% CI = 1.00–3.72) and having an assisted vaginal delivery compared to a spontaneous delivery (OR = 2.57; 95% CI = 1.16–5.70) independently increased women's risk of hemorrhoids, while having a cesarean section (compared to a spontaneous delivery) decreased women's risk (OR = 0.36; 95% CI = 0.16–0.81). In light of the high correlation between mode of birth and episiotomy, the stepwise model was rerun excluding episiotomy as a potential covariate because it had the smaller association with hemorrhoids. However, this exclusion did not change the final model.

Fatigue

In the crude analysis, excessive tiredness or fatigue was associated with maternal complications (OR = 1.84; 95% CI = 1.02–3.32), panic attacks during pregnancy (OR = 2.53; 95% CI = 1.07–6.00), depression prior to pregnancy (OR = 2.13; 95% CI = 1.05–4.31), and depression during pregnancy (OR = 2.48; 95% CI = 1.09–5.66) (Table V). Given the high correlation between the variables depression prior to pregnancy and depression during pregnancy, the former variable was excluded as a covariate in the stepwise model. The following variables were also added to the stepwise multivariate regression model: education, traumatic life events, and no help with housework. The results of the stepwise model showed that depression during pregnancy was the only independent predictor of excessive postpartum fatigue.

Bowel problems

In the bivariate analysis, bowel problems like excessive or unusual diarrhea or constipation were associated with a history of adult emotional abuse (OR = 2.34; 95% CI = 1.21–4.54) (Table V). Household income was also associated with bowel problems; compared to those in the high-income group, those in the intermediate-income group had a lower odds of bowel problems (OR = 0.47; 95% CI = 0.22–0.98). No differences between the low- and high-income groups were found (OR = 1.49; 95% CI = 0.59–3.78). In the stepwise regression analysis, maternal complications, having no help with housework after the birth, smoking status, and

Table IV. Results of the bivariate chisquare (unadjusted) and stepwise regression (adjusted) analysis. Odds ratios and 95% confidence intervals for the risk of perineal pain and hemorrhoids.

Characteristics	Perineal Pain		Hemorrhoids	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Sociodemographic				
Age (years)				
19–29	1.00		1.00	
30–34	1.37 (0.62–3.04)		1.28 (0.62–2.64)	
35–42	1.08 (0.44–2.66)		1.42 (0.65–3.12)	
Household income (Can.)				
< \$32,000 [‡]	0.27 (0.08–0.96) [†]		0.63 (0.23–1.76)	
\$32,000–\$80,000	0.58 (0.27–1.24)		1.52 (0.80–2.88)	
> \$80,000	1.00		1.00	
Education				
High school or less	0.81 (0.35–1.84)		0.48 (0.23–1.02) [†]	
Technical/community college	0.15 (0.48–2.76)		0.55 (0.26–1.15)	
University	1.00		1.00	
Born in Canada	0.81 (0.40–1.62)		1.87 (1.02–3.43)**	1.93 (1.00–3.72)**
Employed in past 12 months	1.58 (0.66–3.76)		1.65 (0.77–3.54)	
Maternal/Obstetric				
Nulliparous	1.90 (0.95–3.80) [†]		1.27 (0.70–2.30)	
Sick leave during pregnancy	0.72 (0.26–1.99)		0.95 (0.42–2.17)	
Labor 12 hrs or more	1.06 (0.47–2.38)		2.04 (0.96–4.33) [†]	
Mode of delivery				
Spontaneous	1.00		1.00*	1.00
Assisted delivery	3.85 (1.70–8.74)*		2.66 (1.21–5.85)	2.57 (1.16–5.70)**
Caesarean section	n/a		0.36 (0.16–0.80)	0.36 (0.16–0.81)**
Maternal complications [§]	1.80 (0.88–3.70) [†]	2.64 (1.15–6.08)**	1.61 (0.88–2.91) [†]	
Perineal Trauma (1 st –4 th degree)	1.69 (0.82–3.47)		1.94 (1.05–3.59)**	
Episiotomy	4.38 (1.97–9.74)*	4.74 (2.00–11.24)*	2.31 (1.14–4.66)**	
Regional epidural or spinal	2.93 (1.19–7.26)**		1.72 (0.72–4.10)	
Birthweight 4000g or more	1.23 (0.43–3.50)		0.92 (0.41–2.04)	
Psychosocial				
2/more traumatic life events	0.63 (0.24–1.61)		0.46 (0.20–1.07) [†]	
Pregnancy not planned	0.31 (0.13–0.70)*	0.28 (0.12–0.68)**	0.94 (0.49–1.81)	
Panic attacks during pregnancy	2.43 (0.94–6.28) [†]		1.77 (0.80–3.87)	
No help with housework (after birth)	0.91 (0.42–1.99)		0.59 (0.29–1.18) [†]	
Smoker	0.26 (0.07–0.96)**		0.50 (0.18–1.42)	
History of Depression				
Depression prior to pregnancy	1.26 (0.55–2.91)		0.92 (0.45–1.85)	
Depression during pregnancy	1.75 (0.68–4.49)		1.68 (0.79–3.59)	
History of Violence				
Child sexual abuse	0.96 (0.37–2.50)		0.56 (0.22–1.38)	
Child physical abuse	0.65 (0.18–2.34)		0.80 (0.24–2.68)	
Adult sexual abuse	1.20 (0.40–3.65)		0.50 (0.19–1.32)	
Adult physical abuse	1.20 (0.33–4.34)		1.15 (0.36–3.64)	
Adult emotional abuse	0.74 (0.35–1.58)		1.03 (0.54–1.94)	

* $p < 0.01$, ** $p < 0.05$, [†] $p < 0.15$. [‡]\$32,000 was approximately Statistics Canada's 1996 low-income cutoff for a family of 4 living in Toronto. [§]Includes 1/more of the following problems from the birth: retained placenta, heavy bleeding, seizure, infection of the uterus, blood clots in leg, problems with episiotomy/scar, pneumonia, urinary tract infection.

depression during pregnancy were also added. The independent predictors of bowel problems were: adult emotional abuse (OR = 2.33; 95% CI = 1.14–4.76), and income. Those in the intermediate income group were less likely to report bowel problems than those in the high-income group (OR = 0.43; 95% CI = 0.20–0.92).

Discussion

The results of this study lend support to the emerging research literature that has documented a high degree of maternal health problems in the

weeks following childbirth. Ninety-six percent of women in this study reported at least one health problem in the 2 months following childbirth. The majority of women (62.5%) reported between two and five symptoms. Other studies that have examined similar health problems have reported comparable figures. For instance, Brown and Lumley [2], found that 94% of their sample of Australian women reported at least one problem within the first 6 months after childbirth while another Australian study found that 94% reported at least one health problem in the first 8 weeks after delivery [6]. Glazener et al. [4] found that

Table V. Results of the bivariate chisquare (unadjusted) and stepwise regression (adjusted) analysis. Odds ratios and 95% confidence intervals for the risk of fatigue and bowel problems.

Characteristics	Fatigue		Bowel Problems	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Sociodemographic				
Age (years)				
19–29	1.00		1.00	
30–34	1.60 (0.80–3.18)		1.17 (0.54–2.52)	
35–42	1.34 (0.63–2.84)		0.73 (0.30–1.78)	
Household income (Can.)				
< \$32,000 [‡]	1.42 (0.56–3.59)		1.49 (0.59–3.78)	1.50 (0.60–3.96)
\$32,000–\$80,000	0.71 (0.38–1.31)		0.47 (0.22–0.98)**	0.43 (0.20–0.92)**
> \$80,000	1.00		1.00	1.00
Education				
High school or less	1.00 (0.50–2.00) [†]		0.67 (0.30–1.49)	
Technical/community college	0.49 (0.24–0.99)		0.69 (0.31–1.53)	
University	1.00		1.00	
Born in Canada	1.10 (0.63–1.94)		1.03 (0.54–1.94)	
Employed in past 12 months	0.65 (0.32–1.31)		0.72 (0.34–1.53)	
Maternal/Obstetric				
Nulliparous	1.27 (0.72–2.26)		1.05 (0.55–2.02)	
Sick leave during pregnancy	1.67 (0.73–3.80)		1.57 (0.68–3.63)	
Labor 12 hrs or more	1.12 (0.53–2.36)		0.65 (0.27–1.60)	
Mode of delivery				
Spontaneous**	1.00		1.00	
Assisted delivery	1.39 (0.64–2.99)		1.59 (0.68–3.76)	
Caesarean section	1.90 (0.97–3.71)		1.54 (0.73–3.24)	
Maternal complications [§]	1.84 (1.02–3.32)**		1.66 (0.87–3.14) [†]	
Perineal Trauma (1 st –4 th degree)	0.71 (0.39–1.28)		0.66 (0.33–1.32)	
Episiotomy	0.78 (0.39–1.55)		1.43 (0.67–3.05)	
Regional epidural or spinal	1.21 (0.56–2.60)		1.60 (0.62–4.19)	
Birthweight 4000g or more	1.34 (0.62–2.89)		1.18 (0.51–2.77)	
Psychosocial				
2/more traumatic life events	2.11 (0.98–4.57) [†]		1.08 (0.48–2.43)	
Pregnancy not planned	1.20 (0.64–2.24)		0.93 (0.46–1.89)	
Panic attacks during pregnancy	2.53 (1.07–6.00)**		1.00 (0.42–2.41)	
No help with housework (after birth)	0.62 (0.33–1.17) [†]		0.49 (0.22–1.10) [†]	
Smoker	1.87 (0.73–4.81)		0.25 (0.06–1.10) [†]	
History of Depression				
Depression prior to pregnancy	2.13 (1.05–4.31)**		1.51 (0.74–3.11)	
Depression during pregnancy	2.48 (1.09–5.66)**	2.48 (1.09–5.66)**	2.05 (0.94–4.48) [†]	
History of Violence				
Child sexual abuse	0.92 (0.41–2.06)		1.41 (0.59–3.35)	
Child physical abuse	0.49 (0.15–1.55)		1.25 (0.37–4.25)	
Adult sexual abuse	0.95 (0.41–2.17)		1.27 (0.52–3.13)	
Adult physical abuse	1.92 (0.57–6.44)		0.48 (0.10–2.26)	
Adult emotional abuse	1.44 (0.77–2.67)		2.34 (1.21–4.54)**	2.33 (1.14–4.76)**

* $p < 0.01$, ** $p < 0.05$, $†p < 0.15$. $‡$ \$32,000 was approximately Statistics Canada's 1996 low-income cutoff for a family of 4 living in Toronto. $§$ Includes 1/more of the following problems from the birth: retained placenta, heavy bleeding, seizure, infection of the uterus, blood clots in leg, problems with episiotomy/scar, pneumonia, urinary tract infection.

approximately 85–87% of Scottish women reported at least one problem in the first 8 weeks postpartum.

These more 'typical' maternal health outcomes have received relatively little research attention. Consequently, their pervasiveness and the cumula-

tive effect that they have on women's postnatal recovery may not be fully appreciated by researchers, clinicians, or even women themselves. Fully half of the women in the current study reported excessive tiredness or fatigue, backaches, breast irritation and

soreness, and painful perineum. One in three women also reported hemorrhoids, and one in four women reported bowel problems and headaches. These health problems contribute to a burden of ill health, and when considered in the broader context of women's lives, they can interfere with women's ability to adjust to new motherhood and to resume prior work, family, and social roles and responsibilities.

Our study further adds to the body of literature on postpartum maternal health by examining a broader array of risk factors than has conventionally been studied including demographic, psychosocial, obstetric and delivery characteristics. The study also established an association between a history of depression and postpartum symptoms. Specifically, women who were depressed during their pregnancy were more likely to report postpartum fatigue and bad headaches than women who were not depressed during their pregnancy. No other variables were independently associated with these symptoms. One possible explanation for the link found between antenatal depression and these health concerns is that women who were depressed during their pregnancy were more likely than non-depressed women to experience an episode of postpartum depression, and fatigue or headaches may have been part of the postpartum depressive syndrome. Several studies have shown that a history of depression, including antenatal depression, is one of the strongest risk factors for postpartum depression [25–28]. Research has also shown an association between migraine or severe headache and major depression in the general population [29]. Another explanation for these findings is differential recall bias, particularly given the cross-sectional nature of the study. That is, women who were experiencing fatigue or bad headaches may have been more likely to recall a history of antenatal depression than women who were not experiencing fatigue or bad headaches.

The study also found an association between adult emotional abuse and postpartum bowel problems such as excessive or unusual diarrhea or constipation. It should be noted that several women who reported adult emotional abuse also had a history of sexual and physical abuse in childhood and adulthood. Other studies have also documented a link between intimate partner violence (IPV) and gastrointestinal symptoms. Coker and colleagues' [11] study of women attending family practice clinics found an association between psychological IPV and digestive tract conditions including frequent indigestion, constipation, or diarrhea. In a review paper, Drossman et al. [30] confirmed a link between sexual and physical abuse and gastrointestinal symptoms. Although the mechanisms underlying this association are unknown, the authors outline a conceptual model that proposes both psychological and physiological causal factors.

With respect to postpartum backache, the only independent predictor was sick leave during pregnancy on doctor's orders. The reasons that women reported for taking leave were quite varied, however, the majority indicated reasons relating specifically to physical health problems or obstetrical problems associated with their pregnancy. The types of problems included back pain, headaches, pelvic pain, fatigue, cold or pneumonia, physical work-related conditions, toxemia, nausea and vomiting, low or high blood pressure, and bleeding. Only one woman who took sick leave reported that it was because of psychological stress. Thus, sick leave taken during pregnancy on the request of a woman's doctor represents another possible marker for postnatal physical morbidity. It should also be acknowledged that the relationship between sick leave and postpartum morbidity might represent a reporting bias in this group of women. Respondents who took sick leave may have been more likely than those who did not take sick leave to see a doctor during their pregnancy for physical health symptoms and also to report having experienced postpartum symptoms like backache.

The study also found that postpartum hemorrhoids were more likely to be reported by women who were Canadian born and those who had assisted vaginal deliveries. Hemorrhoids were less likely to be reported by women who had cesarean sections compared to unassisted vaginal deliveries. Unfortunately, given the small sample size, we were unable to separately examine the effects of vacuum assisted delivery and forceps delivery. Other studies have also documented a link between postpartum hemorrhoids and type of delivery. MacArthur et al. [5] found that forceps delivery increased the risk of hemorrhoids, while cesarean section decreased the risk. Brown and Lumley [2] reported that the risk of hemorrhoids was highest among women with an assisted vaginal birth and lowest among women with a cesarean section. Thompson and colleagues [6] also identified an increased risk of hemorrhoids for women with an assisted delivery compared to women with a cesarean section.

Among women who had a vaginal delivery, the factors associated with perineal pain were episiotomy and one or more maternal complications from the birth. Also, women who did not plan their pregnancy had a lower risk of perineal pain. A literature review of the risks and benefits of episiotomy found that the procedure caused more pain than spontaneous lacerations, at least in the few days after delivery [31]. The author of the review also concluded that the small advantage of episiotomies in preventing anterior perineal lacerations outweigh the risks of such negative outcomes as depth of posterior perineal injury, risk of anal sphincter damage, improper wound healing, and postpartum pain. With respect to maternal complications as a predictor of perineal pain, the prevalence of the specific problems that

composed this variable was: heavy bleeding after the birth (22.0%), problems with the episiotomy or scar (11.5%), infection of the uterus (3.5%), retained placenta (3.0%), urinary tract infection (1.5%), seizure after the birth (0.01%), blood clots in leg (0.0%), and pneumonia (0.0%).

In summary, the findings of this study are important because they confirm the high prevalence of physical health symptoms in women after birth. They also demonstrate the importance of examining a broad array of potential risk factors including demographic, psychosocial, maternal, and obstetric characteristics. History of depression and violence were found to be significant risk factors for some of the postpartum health problems examined. Identifying the full spectrum of risk factors could assist clinicians in understanding and treating women's postpartum health problems. Addressing women's psychosocial histories, rather than focusing on treating the manifested physical symptoms, could improve the efficacy of postpartum care.

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Current knowledge on this subject

Although many studies of women's postpartum health have focused on maternal mortality or major morbidity, fewer have examined the more common health problems experienced by women after childbirth. The available research on this topic suggests that these less severe postpartum health problems are highly prevalent. Studies that have undertaken comprehensive assessments of women's postpartum health report that between 85 and 94% report at least one problem [2,4,6]. Common health problems include extreme fatigue, backache, bowel problems, urinary incontinence, hemorrhoids, perineal pain, and mastitis. Despite the high prevalence of many of these problems, women report being dissatisfied with the lack of available information about these more typical postpartum health experiences [2,8].

Obstetric or delivery-related characteristics have been identified as risk factors for some of these postpartum health problems. Episiotomy has been found to be associated with postpartum morbidity including perineal pain [31]. Mode of delivery has also been identified as a risk factor for postpartum morbidity. For example, women with an assisted vaginal delivery are more likely to report sexual problems and perineal pain than women with spontaneous births [2,6]. Women with cesarean sections are less likely to report perineal pain and urinary incontinence than women with spontaneous births [2,6]. With respect to parity, one study found that nulliparous women were more likely to report perineal pain and sexual problems [6], while another study found that they were more likely to report perineal pain, anemia, vaginal discharge, and piles [4].

What this study adds

This study adds to the small body of literature that examines a wide range of physical health problems reported by women following childbirth. It also makes a novel contribution by considering a broad array of potential risk factors including sociodemographic, psychosocial, and obstetric or delivery-related factors. To our knowledge, this is the first study to evaluate whether women's history of violence and depression are associated with these postpartum health problems. The study documented an association between antenatal depression and excessive postpartum fatigue and bad headaches. Also, adult abuse was associated with an increased risk of bowel problems.

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