Approaches to Screening for Intimate Partner Violence in Health Care Settings

A Randomized Trial

Harriet L. MacMillan, MD, MSc
C. Nadine Wathen, PhD
Ellen Jamieson, MEd
Michael Boyle, PhD
Louise-Anne McNutt, PhD
Andrew Worster, MD
Barbara Lent, MD
Michelle Webb, BSc
for the McMaster Violence Against Women Research Group

Context Screening for intimate partner violence (IPV) in health care settings has been recommended by some professional organizations, although there is limited information regarding the accuracy, acceptability, and completeness of different screening methods and instruments.

Objective To determine the optimal method for IPV screening in health care settings.

Design and Setting Cluster randomized trial conducted from May 2004 to January 2005 at 2 each of emergency departments, family practices, and women's health clinics in Ontario, Canada.

Participants English-speaking women aged 18 to 64 years who were well enough to participate and could be seen individually were eligible. Of 2602 eligible women, 141 (5%) refused participation.

Intervention Participants were randomized by clinic day or shift to 1 of 3 screening approaches: a face-to-face interview with a health care provider (physician or nurse), written self-completed questionnaire, and computer-based self-completed questionnaire. Two screening instruments—the Partner Violence Screen (PVS) and the Woman Abuse Screening Tool (WAST)—were administered and compared with the Composite Abuse Scale (CAS) as the criterion standard.

Main Outcome Measures The approaches were evaluated on prevalence, extent of missing data, and participant preference. Agreement between the screening instruments and the CAS was examined.

Results The 12-month prevalence of IPV ranged from 4.1% to 17.7%, depending on screening method, instrument, and health care setting. Although no statistically significant main effects on prevalence were found for method or screening instrument, a significant interaction between method and instrument was found: prevalence was lower on the written WAST vs other combinations. The face-to-face approach was least preferred by participants. The WAST and the written format yielded significantly less missing data than the PVS and other methods. The PVS and WAST had similar sensitivities (49.2% and 47.0%, respectively) and specificities (93.7% and 95.6%, respectively).

Conclusions In screening for IPV, women preferred self-completed approaches over face-to-face questioning; computer-based screening did not increase prevalence; and written screens had fewest missing data. These are important considerations for both clinical and research efforts in IPV screening.

Trial Registration clinicaltrials.gov Identifier: NCT00336297

JAMA. 2006;296:530-536 www.jama.com

As intimate partner violence (IPV) has gained recognition as a major public health problem,[1,2] research efforts have focused on the development of universal screening instruments and protocols for use in health care settings to identify women exposed to IPV.[3] Many national medical organizations, governmental agencies, and advocacy groups have recommended universal or routine IPV screening,[4] although there is a lack of research examining its effectiveness on health outcomes for women.[5-7] An ongoing question in the field is whether health care professionals should routinely screen their female patients for exposure to IPV.[8]

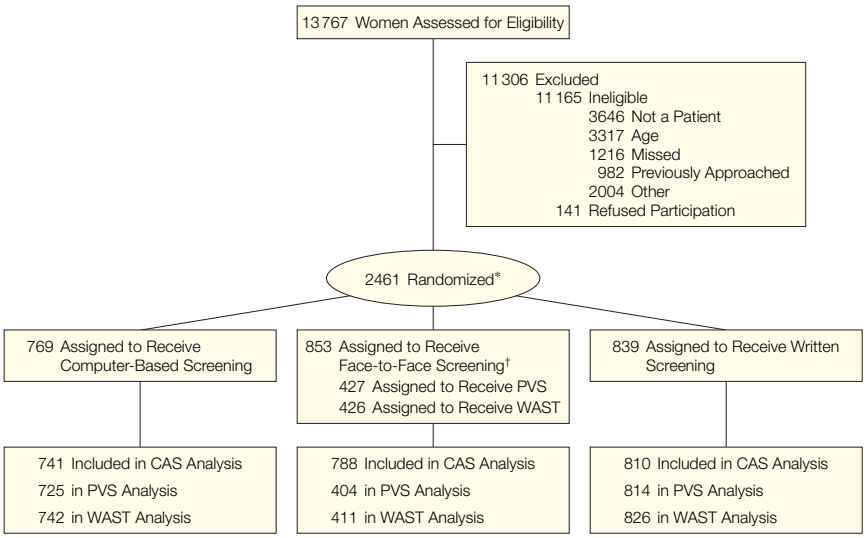
Previous studies have demonstrated that women will disclose experiences of violence in response to screening[3-7]; however, few studies have compared methods of administration. In a review of IPV screening in the primary care setting, Chuang and Liebschutz[9] identified 2 main approaches to screening: (1) verbal methods (questions asked by a clinician) and (2) self-administered methods, including written or computer-based questionnaires. The limited amount of research to date has generally compared IPV prevalence on face-to-face questioning with a written self-completed questionnaire. Anderst and

Author Affiliations and a list of the members of the McMaster Violence Against Women Research Group appear at the end of this article.
Corresponding Author: Harriet L. MacMillan, MD, MSc, FRCP(C), Offord Centre for Child Studies, Department of Psychiatry and Behavioural Neurosciences, McMaster University, Patterson Building, Chedoke Site, 1200 Main St W, Hamilton, Ontario, Canada L8N 3Z5 (macmilnh@mcmaster.ca).

colleagues[10] compared verbal screening with a written self-administered questionnaire among women accompanying children to pediatric visits. Each woman received either verbal or written questions. A much smaller proportion of women responded to the written screening questions, and of those who did, none reported IPV exposure, leading the investigators to conclude that verbal screening was superior. However, the screens did not include the same questions, and the sampling methods varied between groups. A study by McFarlane et al[11] compared written self-report with a nurse interview questionnaire using the same 4 IPV questions in a sample of women attending a Planned Parenthood clinic. Higher prevalence estimates of abuse were recorded during nurse interviews. The methods were not randomly assigned, and it is not clear that both groups of women underwent the same study procedures. In contrast, a study of new obstetric patients showed higher disclosures with a written questionnaire compared with verbal questioning. However, this was based on a review of medical records comparing responses from patients who received both a self-report written instrument that included questions about exposure to IPV and a set of different verbal questions on the topic asked by a midwife.[12] In the largest of the studies comparing screening methods, more than 4600 women presenting in 11 emergency departments in Pennsylvania and California completed an identical screening questionnaire either in a written self-administered format or administered by a nurse. Those using the written approach were significantly more likely to disclose physical or sexual abuse in the past year.[13]

None of the studies comparing verbal questioning with written questionnaires involved random assignment of participants to receive alternate methods of IPV screening. Furthermore, IPV prevalence appeared to be the single criterion of effectiveness in each of these studies, even though patient acceptability and other feasibility issues are also important.

Figure. Flow of Participants Through the Trial



CAS indicates Composite Abuse Scale.
*Randomization was by day or shift in 6- or 9-week periods.
†Only one of Partner Violence Screen (PVS) or Woman Abuse Screening Tool (WAST) was administered in the face-to-face arm.

Rhodes and colleagues[14,15] evaluated the feasibility and effect on IPV disclosure of using computers in an emergency department. They concluded that use of the computer led to more IPV disclosures and patient-practitioner discussion of IPV compared with a usual care group that did not specifically receive screening. These studies do not provide any information about the appropriateness of computer-based screening compared with verbal or written screening, but the findings suggest that this approach warrants further study.

The current study was undertaken to contrast 2 screening instruments with the goal of determining an optimal method (computer, written, face-to-face) of screening for IPV in health care settings, based on 3 criteria: (1) 12-month prevalence, (2) extent of missing data, and (3) participant preference.

METHODS

Study Setting and Participants

The study was conducted in Ontario, Canada, from May 2004 to January 2005. Participants were recruited from primary, acute, and specialty health care settings: 2 family practices, 2 emergency departments, and 2 women's health clinics. All women who presented for an appointment at a participating site were approached. Women were eligible for participation if they were: (1) 18 to 64 years old, (2) at the site for their own health care visit, (3) able to separate themselves from individuals who accompanied them, (4) able to speak and read English, (5) not too ill to participate, and (6) able to provide informed consent. The trial flow diagram is shown in the FIGURE.

All participants provided written informed consent prior to enrollment. For safety reasons, no reference to "abuse" or "violence" was made until women were taken to a private room where the informed consent process occurred. Women were told that their health care provider (a physician or nurse) would not be informed of their responses to the screens, but was available to discuss any concerns they might have. In the face-to-face arm of the trial, however, health care providers would necessarily be aware of women's responses. All participants were provided with information about resources in the community and the option to shred any study material they felt might put them at risk.

Health care providers received specialized training in responding to IPV.

The study was approved by the research ethics boards of McMaster University/Hamilton Health Sciences, The University of Western Ontario/London Health Sciences Centre, Cambridge Memorial Hospital, and Norfolk General Hospital's Medical Advisory Committee.

Sample Size and Randomization

Sample size was calculated based on the null hypothesis of no differences in 12-month IPV prevalence across methods, with α set at .05 (2-tailed test) and power set at $1-\beta$=80%. Based on the literature,[16,17] we expected an overall prevalence of IPV of 15%. It was hypothesized that prevalence across methods of administration would be: face-to-face, 10%; written, 15%; and computer, 20%; this required a sample size of 246 per group per care type.

Randomization was by day (or shift for sites with regular hours longer than 8 hours) in 6-week (for sites with no shifts or 2 shifts) or 9-week (for sites with 3 shifts) periods. A table for each day of the week was created, and a random number table was used to assign clinic shifts to 1 of 3 methods. For example, the table for a Sunday in an emergency department with two 12-hour shifts would have 3 columns (computerized, written, and face-to-face) and 2 rows (day, night). The random number table determined the order of the numbers 1 through 6 in the cells. So, for example, the Sunday of week 1 was allocated to written, night shift; the Sunday of week 2 was allocated to computerized, day shift, and so on, for the 6-week period. This ensured balance across shifts and days of the week. The research coordinator created calendars that informed site coordinators of the assignments. The order in which the screening instruments were completed was also randomly varied.

Measures

In addition to standard demographic questions, participants completed the Partner Violence Screen (PVS)[18] and the Woman Abuse Screening Tool (WAST).[19] These 2 measures were selected following a systematic review of screening instruments based on their psychometric properties and use in settings comparable with those in this study.[3] The PVS (3 items) addresses physical abuse and feelings of safety; when compared with the Conflict Tactics Scales (CTS), the sensitivity was 71.4% and the specificity was 84.4%.[18] The WAST (8 items) includes multiple forms of abuse (physical, sexual, and emotional) and has good internal consistency (Cronbach α coefficient of 0.75), and more than 90% of women reported being "comfortable" or "very comfortable" when administered the WAST in a previous study.[19] Both screening instruments ask about experiences within the last 12 months. The instruments and information about scoring are shown in the BOX.

The Composite Abuse Scale (CAS),[20,21] a 30-item validated research instrument, was selected as the criterion standard for its comprehensiveness and strong psychometric properties: the Cronbach α for each of 4 subscales is greater than 0.85, and they correlate highly with corresponding subscales of the CTS. The CAS was administered to determine the agreement of the WAST and PVS with this instrument. It was scored as recommended by summing the frequency scores for the 30 items; a score of 7 or more was the criterion for exposure to IPV.

To evaluate participant preference of screening approach, women were asked 3 questions about their method of screening: (1) Was it "easy"?; (2) Did you "like answering" [in that way]?; and (3) Was it "private enough"? The responses were scaled 1 ("not at all") to 5 ("very easy" or "a lot").

Procedures

After obtaining consent, the on-site study recruiter provided participants with 1 of 3 methods, according to the randomization schedule.

Computer-Based Self-Completed Method. The participant was given a tablet computer and asked to complete the screening instruments (PVS and WAST, randomly ordered), followed by the evaluation questions. If a participant did not respond to a question, a reminder window appeared; she could then answer the question or continue without answering. Once done, the participant exited the questionnaire program and returned the tablet to the study recruiter. She then completed the demographic questions and CAS on paper.

Written Self-Completed Method. The participant was given a paper version of the demographic questionnaire and screening instruments (PVS and WAST, randomly ordered), followed by the evaluation questions; the questionnaire closed with the CAS. Completed questionnaires were returned to the recruiter in a sealed envelope.

Face-to-Face Method With Verbal Questioning by the Health Care Provider. After obtaining consent, the recruiter informed the health care provider of the patient's participation by inserting a pink slip of paper into the patient's chart. Participants were verbally screened by their health care provider with one of the 2 screening instruments, randomly determined. Due to the nature of the screening method, disclosures became part of the clinical encounter; women who disclosed abuse were offered the usual care provided by that site. Following the screen, the participant completed a written version of the demographic questions, the evaluation items, and the CAS.

Statistical Analysis

Descriptive statistics were run for sample characteristics by group. Because the participant evaluation items showed a skewed distribution, items were dichotomized as less than 5 or 5.

Data were considered missing if abuse status could not be determined. For the abuse instruments, if a participant provided sufficient data to score positive, she was deemed "positive," regardless of the number of missing

items. If a participant scored negative on all completed items, with 1 or more incomplete items, her status was "missing."

Multilevel logistic regression and the statistical software MLwiN[22] were used to model disclosure, missing data, and participant evaluations of the screening methods. Evidence of clustering indicated that the analysis of prevalence and participant evaluations required the use of a 3-level model (*i* binary responses, nested within *j* women, nested within *k* time blocks), while the analysis of missing data required a 2-level model (no clustering between time blocks). The large-sample χ^2 test statistic was used to assess the statistical significance of model parameters.

RESULTS

TABLE 1 shows the characteristics of the sample by group. Almost 56% of the women were married, and just fewer than half had 1 or 2 children living at home. More than 50% were well-educated; just fewer than half were working outside the home.

Prevalence by Screening Method

Twelve-month prevalence ranged from 4.1% to 17.7% depending on method, instrument, and setting (TABLE 2). Prevalence was significantly lower in family practices (χ^2_1=18.5; P<.001) and women's health clinics (χ^2_1=29.4; P<.001) vs emergency departments. There was also a statistically significant interaction between method and instrument: for the written method, prevalence was lower on the WAST than on the PVS (χ^2_1=5.5; P=.02).

Missing Data

Proportions of missing data differed by instrument and method (Table 2). Lower levels of missing data occurred for the WAST vs PVS (χ^2_1=9.2; P=.002) and for the written method vs the face-to-face and computer-based methods combined (χ^2_1=11.9; P<.001). In the analysis of missing data, there was no variability associated with time blocks, no statistically significant interactions between instrument and method, and no statistically significant differences between settings in levels of missing data.

Box. Screening Instruments Used in the Study*

Partner Violence Screen (PVS)[18]†

1. Have you been hit, kicked, punched, or otherwise hurt by someone in the past year?
   ☐ Yes
   ☐ No
   If so, by whom?
   ☐ Person in current relationship
   ☐ Person from previous relationship
   ☐ Someone else
2. Do you feel safe in your current relationship?
   ☐ Yes
   ☐ No
3. Is there a partner from a previous relationship who is making you feel unsafe now?
   ☐ Yes
   ☐ No

Woman Abuse Screening Tool (WAST)[19]‡

1. In general how would you describe your relationship?
   ☐ A lot of tension ☐ Some tension ☐ No tension
2. Do you and your partner work out arguments with:
   ☐ Great difficulty ☐ Some difficulty ☐ No difficulty
3. Do arguments ever result in you feeling put down or bad about yourself?
   ☐ Often ☐ Sometimes ☐ Never
4. Do arguments ever result in hitting, kicking, or pushing?
   ☐ Often ☐ Sometimes ☐ Never
5. Do you ever feel frightened by what your partner says or does?
   ☐ Often ☐ Sometimes ☐ Never
6. Has your partner ever abused you physically?
   ☐ Often ☐ Sometimes ☐ Never
7. Has your partner ever abused you emotionally?
   ☐ Often ☐ Sometimes ☐ Never
8. Has your partner ever abused you sexually?
   ☐ Often ☐ Sometimes ☐ Never

*Both the PVS and the WAST had preambles that indicated the questions applied to the last 12 months.
†Answering yes to question 1 (and indicating it was by a person in a current or previous relationship) or question 3, or no to question 2 met the criteria for intimate partner violence exposure.
‡Endorsing either question 1 ("a lot of tension") or question 2 ("great difficulty") met the criteria for intimate partner violence exposure; questions 3 to 8 were not used in this determination.

Participant Evaluation: Ease, Preference, and Privacy of Method

On all 3 evaluation indicators, women chose computerized and written methods over face-to-face questioning

(ease: computerized [χ^2_1=21.5; $P<.001$] and written [χ^2_1=92.1; $P<.001$]; preference: computerized [χ^2_1=121.1; $P<.001$] and written [χ^2_1=107.0; $P<.001$]; and privacy: computerized [χ^2_1=36.7; $P<.001$] and written [χ^2_1=46.4; $P<.001$]). There were no statistically significant interactions between instrument and method or between setting and method.

Test Characteristics of Screening Instruments

The estimated test characteristics of the PVS and WAST screens were compared with the CAS. The sensitivities (PVS, 49.2%; WAST, 47.0%) as well as the specificities (PVS, 93.7%; WAST, 95.6%) were very similar. The positive predictive value of the WAST (55.3%) was minimally higher than for the PVS (47.0%), and the negative predictive values were almost the same (PVS, 94.2%; WAST, 94.0%), leading to very similar accuracies (PVS, 89.2%; WAST, 90.6%).

COMMENT

This randomized trial compared 3 methods of IPV screening using 2 instruments on IPV detection, extent of missing data, and acceptability of screening approach, yielding some interesting findings. Although some literature suggests that use of computer-based questionnaires may lead to higher disclosures of sensitive issues than other approaches,[24,25] we did not find that computer-based screening increased the detection of IPV relative to other screening methods.

We found that there was an interaction between method and instrument, with the written WAST having the lowest prevalence. We were surprised by this finding, although the evidence regarding verbal vs written disclosure is mixed.[10-13] It is noteworthy that lower written disclosure was specific to the WAST.

Use of written questionnaires led to significantly fewer missing data, in contrast with the findings of Anderst et al.[10]

On all 3 measures of acceptability (ease of responding, likeability, and privacy), the face-to-face method was least preferred by participants. These findings have some recent support in the literature. A study comparing audiotaped screening with written screening in a pediatric emergency department[26] found no statistically significant difference in IPV disclosures between the 2 methods but several patterns in women's preferences. Specifically, women found the audiotaped method to be less risky and more private than the written approach, and among both the entire sample and the subgroup of women disclosing abuse, the written and audiotaped methods were significantly preferred to the idea of disclosing IPV directly to a health care provider. Coupled with our findings, and those of Glass et al,[13] there seems to be emerging evidence that direct questioning by clinicians is less favored by women compared with self-report versions, whether delivered by computer, audiotape, or written questionnaire.

Table 1. Sample Characteristics by Group

	No. (%)			
	Computerized (n = 769)	Face-to-Face (n = 853)	Written (n = 839)	Total (N = 2461)
Married	396 (52.7)	455 (56.9)	469 (57.5)	**1320** (55.8)
1 or 2 children at home	342 (45.6)	378 (47.8)	374 (46.2)	**1094** (46.6)
Born in Canada	643 (85.7)	711 (88.8)	714 (87.5)	**2068** (87.4)
Education >14 y	391 (52.6)	413 (51.7)	425 (52.3)	**1229** (52.2)
Working full- or part-time	343 (45.9)	373 (46.7)	392 (48.1)	**1108** (46.9)
Main source of income wages or salary	416 (55.7)	467 (58.5)	479 (59.0)	**1362** (57.8)
Household income in lowest quintile (<$24 000)*	157 (21.5)	121 (15.5)	125 (15.9)	**403** (17.6)
Age, mean (SD), y	36.7 (11.6)	37.6 (12.1)	36.9 (12.0)	37.1 (11.9)

*Data from Income Statistics Division.[23]

Table 2. Observed Prevalence, Missing Data, and Participant Preference by Screening Method

	Computerized, % (95% CI)		Face-to-Face, % (95% CI)		Written, % (95% CI)	
	PVS	WAST	PVS	WAST	PVS	WAST
Prevalence						
Emergency department (n = 768)	17.7 (12.8-22.6)	16.9 (12.2-21.6)	10.9 (5.3-16.5)	12.6 (6.8-18.4)	17.4 (12.7-22.1)	11.3 (7.4-15.2)
Family practice (n = 814)	8.4 (4.9-11.9)	7.8 (4.4-11.1)	11.6 (6.3-16.9)	9.0 (4.1-13.8)	8.6 (5.2-11.9)	5.4 (2.7-8.1)
Women's health clinics (n = 879)	7.6 (4.3-10.9)	5.9 (3.0-8.8)	4.1 (0.9-7.6)	10.0 (5.2-14.8)	8.2 (5.1-11.3)	4.8 (2.3-7.2)
Total (N=2461)	11.2 (8.8-13.5)	10.1 (7.9-12.3)	8.7 (5.9-11.4)	10.5 (7.5-13.4)	11.2 (9.0-13.3)	7.0 (5.3-8.8)
Missing Data						
Unknown abuse status	5.7 (4.1-7.4)	3.5 (2.2-4.8)	5.2 (3.1-7.3)	3.7 (1.9-5.5)	3.0 (1.8-4.1)	1.5 (0.7-2.4)
Participant Evaluation of Method: Proportion Rating 5 (Best)						
Easy*	87.5 (85.1-89.9)		77.1 (74.2-80.0)		94.6 (93.1-96.2)	
Preferred	70.6 (67.2-73.9)		39.9 (36.5-43.3)		68.1 (64.9-71.3)	
Private	76.9 (73.8-80.0)		58.0 (54.6-61.5)		78.3 (75.4-81.1)	

Abbreviations: CI, confidence interval; PVS, Partner Violence Screen; WAST, Woman Abuse Screening Tool.
*For face-to-face screening, the wording was, "Was it easy to answer the questions face-to-face?"

The estimated sensitivities and specificities of both instruments in relation to the CAS were remarkably similar; the low sensitivity means that a sizeable proportion of women who disclosed exposure to IPV on the CAS were not identified on either the WAST or the PVS. This is likely because the CAS includes many more questions covering a broad range of abusive behaviors in several domains, including harassment.

This study has limitations that need to be considered in interpreting the results. First, review of the sample characteristics by method shows that the women completing the computer-based screen had a higher proportion of participants in the lowest income quintile compared with those administered the other 2 approaches. Women of lower socioeconomic status might respond differently to a computer-based approach; however, there was no difference in other related variables, including education and work status, reducing the likelihood of a bias regarding acceptability of the computer screen.

Second, although we attempted to keep all other aspects of the protocol consistent across methods, the responses of women who underwent the face-to-face approach were known to the health care providers asking them. This aspect could have influenced women's willingness to disclose, although interestingly, there were no consistent patterns in disclosure by method. In addition, they were asked questions from only 1 instrument, either the WAST or the PVS, to reduce burden on both the clinician in having to administer more than 1 questionnaire verbally and the participant in having to verbally respond to 2 instruments with similar questions.

Last, although the CAS is a useful standard for comparison, it is not free of error: this error, in conjunction with the error associated with the screening tests, will serve to attenuate the estimation of sensitivities and specificities. The CAS was chosen because it was the most comprehensive measure of the IPV experience.

In summary, the findings from this study examining 3 approaches to IPV screening in health care settings suggest that the face-to-face approach is the least preferred by women, irrespective of instrument. With regard to selection of method based on prevalence, however, there was an interaction between method and instrument: it appears that the written format of the WAST may lead to some underestimation of disclosure. In theory, sensitivity of the WAST could be improved by changing the scoring criteria to include more items (see Box). The result of least missing data by written self-completed questionnaire is worth noting, especially for research applications, but also when considering clinical policies for IPV detection and intervention. Prevalence, missing data, and preference are all important considerations for both clinical and research efforts in IPV screening.

Author Affiliations: Department of Psychiatry and Behavioural Neurosciences (Drs MacMillan, Wathen, Boyle and Mss Jamieson and Webb), Department of Pediatrics (Dr MacMillan), and Department of Emergency Medicine (Dr Worster), McMaster University, Hamilton, Ontario; Department of Epidemiology and Biostatistics, University at Albany—State University of New York (Dr McNutt); and Department of Family Medicine, The University of Western Ontario, London (Dr Lent).

Author Contributions: Drs MacMillan and Boyle and Ms Jamieson had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.
Study concept and design: MacMillan, Wathen, Jamieson, McNutt, Worster, Lent.
Acquisition of data: MacMillan, Worster, Lent, Webb.
Analysis and interpretation of data: MacMillan, Wathen, Jamieson, Boyle, McNutt.
Drafting of the manuscript: MacMillan, Wathen, Jamieson.
Critical revision of the manuscript for important intellectual content: MacMillan, Wathen, Jamieson, Boyle, McNutt, Worster, Lent, Webb.
Statistical analysis: MacMillan, Jamieson, Boyle, McNutt.
Obtained funding: MacMillan, Wathen.
Administrative, technical, or material support: Worster, Lent, Webb.
Study supervision: MacMillan, Worster, Lent.
Financial Disclosures: None reported.

Members of the McMaster University Violence Against Women Research Group: Harriet L. MacMillan, MD, MSc, FRCP(C) (principal investigator), Departments of Psychiatry and Behavioural Neurosciences and Pediatrics, McMaster University, Hamilton, Ontario; Tom Abernathy, PhD, and Kathryn Bennett, PhD (coinvestigators), McMaster University, Hamilton, Ontario; Charlene Beynon, RN, MScN (coinvestigator), Middlesex-London Public Health Research Education & Development (PHRED) Program, and School of Nursing, The University of Western Ontario, London; Michael Boyle, PhD (coinvestigator), Departments of Psychiatry and Behavioural Neurosciences and Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario; Marilyn Ford-Gilboe, RN, PhD (coinvestigator), School of Nursing, The University of Western Ontario, London; Susan Jack, RN, PhD (coinvestigator), School of Nursing, McMaster University, Hamilton, Ontario; Clare Freeman, CYW, BA, MSW (coinvestigator), Interval House of Hamilton Women's Shelter, Hamilton, Ontario; Amiram Gafni, PhD (coinvestigator), Department of Clinical Epidemiology and Biostatistics and Centre for Health Economics and Policy Analysis, McMaster University, Hamilton, Ontario; Iris Gutmanis, BSc (PT), PhD (coinvestigator), Department of Epidemiology and Biostatistics, Schulich School of Medicine and Dentistry, The University of Western Ontario, London; Ellen Jamieson, MEd, and Nadine Wathen, PhD (coinvestigators), Department of Psychiatry and Behavioural Neurosciences, McMaster University, Hamilton, Ontario; Barbara Lent, MA, MD, CCFP, FCFP (coinvestigator), Department of Family Medicine, Schulich School of Medicine & Dentistry, The University of Western Ontario, London; Joyce Lock, MD, CCFP (EM), FRCP(C) (coinvestigator), Department of Emergency Medicine, McMaster University, Hamilton, Ontario, and Nina's Place, the Halton Regional Domestic Violence/Sexual Assault Care Centre, Burlington, Ontario; Daina Mueller, RN, BScN, MSc (coinvestigator), Hamilton Social and Public Health Services Department, and School of Nursing at McMaster University, Hamilton, Ontario; Rosana Pellizzari, MD, MSc, CCFP (coinvestigator), Department of Family and Community Medicine, University of Toronto and Medical Officer of Health, Perth District Health Unit, Stratford, Ontario; Anna Marie Pietrantonio, MSW, RSW (coinvestigator), Child Advocacy and Assessment Program, McMaster Children's Hospital, and Departments of Psychiatry and Behavioural Neurosciences, and School of Social Work, McMaster University, Hamilton, Ontario; Rachelle Sender (Beauchamp) MD, PhD, CCFP, and Diana Tikasz, MSW, RSW (coinvestigators), Sexual Assault/Domestic Violence Care Centre, Hamilton Health Sciences, Hamilton, Ontario; Helen Thomas, RN, MSc (coinvestigator), School of Nursing, McMaster University and Hamilton Social and Public Health Services Department, Hamilton, Ontario; Jackie Thomas, MD, MSc, FRCS(C) (coinvestigator), Department of Obstetrics and Gynecology, University of Toronto and Mount Sinai Hospital, Toronto, Ontario; Leslie Tutty, PhD (coinvestigator), School of Social Work, University of Calgary, Calgary, Alberta; Margo I. Wilson, PhD, MSL (coinvestigator), Department of Psychology, McMaster University, Hamilton, Ontario; Andrew Worster, MD, MSc (coinvestigator), Department of Medicine, McMaster University and Emergency Medicine at Hamilton Health Sciences, Hamilton, Ontario.

Consultants: Louise-Anne McNutt, PhD, Department of Epidemiology, School of Public Health, University at Albany, State University of New York; Jeffrey Coben, MD, Department of Emergency Medicine and Community Medicine, West Virginia University School of Medicine, Morgantown; Jacquelyn C. Campbell, PhD, School of Nursing and Associate Dean for Faculty Affairs, Johns Hopkins University, Baltimore, Md. The consultants were compensated from the grant funds for their time attending meetings and participating in phone calls.
Funding/Support: This study was funded by the Ontario Women's Health Council, Ontario Ministry of Health and Long-term Care. Dr MacMillan holds a Canadian Institutes of Health Research (CIHR) New Emerging Team grant from the Institutes of Gender and Health; Aging; Human Development, Child and Youth Health; Neurosciences, Mental Health and Addiction; and Population and Public Health. Dr Wathen holds a CIHR-Ontario Women's Health Council Fellowship. Dr Boyle holds a Canada Research Chair in the Social Determinants of Child Health.

Role of the Sponsor: The Ontario Women's Health Council had no role in the design or conduct of the study; in the collection, management, analysis, or interpretation of the data; or in the preparation, review, or approval of the manuscript.

Acknowledgment: We thank Harry S. Shannon, PhD, Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario, for his consultation regarding sample size determination. Dr Shannon received a small honorarium for his work. We are very grateful to the participants, clinical staff, and administrators of the participating sites: Cambridge Memorial Hospital, Carlisle Family Practice, Hamilton Health Sciences, London Health Sciences Centre (LHSC), Norfolk General Hospital, and Victoria Family Medical Centre of LHSC.

REFERENCES

1. Tjaden P, Thoennes N. *Full Report of the Prevalence, Incidence and Consequences of Violence Against Women: Research Report.* Washington, DC: National Institute of Justice; 2000. NCJ 183781.

2. Statistics Canada. *Family Violence in Canada: A Statistical Profile 2002*. Ottawa, Ontario: Canadian Centre for Justice Statistics; 2002. Catalogue No. 85-224-XIE.

3. MacMillan HL, Wathen CN; Canadian Task Force on Preventive Health Care. Prevention and Treatment of Violence Against Women: Systematic Review and Recommendations. 2001. http://www.ctfphc.org/Full_Text/CTF_DV_TR_final.pdf. Accessed June 28, 2006.

4. Datner EM, O'Malley M, Schears RM, Shofer FS, Baren J, Hollander JE. Universal screening for interpersonal violence: inability to prove universal screening improves provision of services. *Eur J Emerg Med*. 2004;11:35-38.

5. Ramsay J, Richardson J, Carter YH, Davidson LL, Feder G. Should health professionals screen women for domestic violence? systematic review. *BMJ*. 2002; 325:314.

6. Nelson HD, Nygren P, McInerney Y, Klein J. Screening women and elderly adults for family and intimate partner violence: a review of the evidence for the U.S. Preventive Services Task Force. *Ann Intern Med*. 2004; 140:387-396.

7. Wathen CN, MacMillan HL. Interventions for violence against women: scientific review. *JAMA*. 2003; 289:589-600.

8. Taket A, Wathen CN, MacMillan HL. Should health professionals screen all women for domestic violence? *PLoS Med*. 2004;1:e4.

9. Chuang CH, Liebschutz JM. Screening for intimate partner violence in the primary care setting: a critical review. *J Clin Outcomes Mgt*. 2002;9:565-573.

10. Anderst J, Hill TD, Siegel RM. A comparison of domestic violence screening methods in a pediatric office. *Clin Pediatr (Phila)*. 2004;43:103-105.

11. McFarlane J, Christoffel K, Bateman L, Miller V, Bullock L. Assessing for abuse: self-report versus nurse interview. *Public Health Nurs*. 1991;8:245-250.

12. Webster J, Holt V. Screening for partner violence: direct questioning or self-report? *Obstet Gynecol*. 2004;103:299-303.

13. Glass N, Dearwater S, Campbell J. Intimate partner violence screening and intervention: data from eleven Pennsylvania and California community hospital emergency departments. *J Emerg Nurs*. 2001;27: 141-149.

14. Rhodes KV, Lauderdale DS, He T, Howes DS, Levinson W. "Between me and the computer": increased detection of intimate partner violence using a computer questionnaire. *Ann Emerg Med*. 2002;40: 476-484.

15. Rhodes KV, Drum M, Anliker E, Frankel RM, Howes DS, Levinson W. Lowering the threshold for discussions of domestic violence: a randomized controlled trial of computer screening. *Arch Intern Med*. 2006;166:1107-1114.

16. Clark JP, Du Mont J. Intimate partner violence and health: a critique of Canadian prevalence studies. *Can J Public Health*. 2003;94:52-58.

17. Dearwater SR, Coben JH, Campbell JC, et al. Prevalence of intimate partner abuse in women treated at community hospital emergency departments. *JAMA*. 1998;280:433-438.

18. Feldhaus KM, Koziol-McLain J, Amsbury HL, Norton IM, Lowenstein SR, Abbott JT. Accuracy of 3 brief screening questions for detecting partner violence in the emergency department. *JAMA*. 1997;277: 1357-1361.

19. Brown JB, Lent B, Schmidt G, Sas G. Application of the Woman Abuse Screening Tool (WAST) and WAST-Short in the family practice setting. *J Fam Pract*. 2000;49:896-903.

20. Hegarty K, Sheehan M, Schonfeld C. A multidimensional definition of partner abuse: development and preliminary validation of the Composite Abuse Scale. *J Fam Violence*. 1999;14:399-415.

21. Hegarty K, Bush R, Sheehan M. The Composite Abuse Scale: further development and assessment of reliability and validity of a multidimensional partner abuse measure in clinical settings. *Violence Vict*. 2005; 20:529-547.

22. Rasbash J, Steele F, Browne W, Prosser BA. *User's Guide to MLwiN, Version 2.0*. London, England: University of London, Institute of Education; 2004.

23. Table 202-0405: Upper income limits and income shares of total income quintiles, by economic family type, 2004 constant dollars. Income Statistics Division. Statistics Canada Web site. http://www.statcan.ca/english/freepub/75-202-XIE/2004000/related.htm. Accessibility verified June 23, 2006.

24. Turner CF, Ku L, Rogers SM, Lindberg LD, Pleck JH, Sonenstein FL. Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. *Science*. 1998;280:867-873.

25. Hasley S. A comparison of computer-based and personal interviews for the gynecologic history update. *Obstet Gynecol*. 1995;85:494-498.

26. Bair-Merritt MH, Feudtner C, Mollen CJ, Winters S, Blackstone M, Fein JA. Screening for intimate partner violence using an audiotape questionnaire: a randomized clinical trial in a pediatric emergency department. *Arch Pediatr Adolesc Med*. 2006;160:311-316.

