A Pre-Test Post-Test Study to Assess the Readiness to Manage Intimate Partner Violence within the Fracture Clinic 12 Months Following Completion of an Educational Program

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More Detailed Keywords:	Intimate Partner Violence, EDUCATE, IPV, Educational Program, Pre-test Post-test, Fracture Clinic
Keywords:	Orthopedic surgery, Clinical Practice Guidelines, Medical education
Abstract:	ABSTRACT Background: We developed an intimate partner violence (IPV) educational program with the overarching goal of improving the preparedness of health care providers' (HCPs) to help patients who are victims of IPV. Our previously published study found significant improvements in HCPs' readiness to manage IPV at 3 months following completion of the educational training. This study sought to determine if similar improvements were observed at 12-months post-training. Methods: We enrolled 140 participating HCPs from 7 fracture clinics in Canada and the United States and administered the Physician Readiness to Manage IPV Survey (PREMIS) before participants completed the educational program (baseline), immediately after training, and at 3months and 12 months post-training. In this study, we compared mean 12 month scores to mean baseline scores for each of the PREMIS subscales using linear regression models. Results: We found statistically significant improvements among

	participating HCPs' actual knowledge about IPV 12 months after training. Statistically significant improvements from baseline to 12 months were also observed for 7 of the 9 other subscales of the PREMIS. These subscales included perceived preparation, perceived knowledge, preparation, legal requirements, workplace issues, self-efficacy, and practice issues. Interpretation: The EDUCATE program led to significant improvements in HCPs' readiness to manage IPV, with positive changes being observed 12 months after training occurred. These findings indicate that HCPs who receive this training are better equipped to manage patients who have experienced IPV.

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	Title Page
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	5
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5
Bias	9	Describe any efforts to address potential sources of bias	5-7
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	5
		(*b*) Describe any methods used to examine subgroups and interactions	5
		(*c*) Explain how missing data were addressed	5
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	5
		(*e*) Describe any sensitivity analyses	5

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6
		(b) Give reasons for non-participation at each stage	6-8
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Table 1
		(b) Indicate number of participants with missing data for each variable of interest	N/A
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	Page 6, Table 2
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Table 2
		(*b*) Report category boundaries when continuous variables were categorized	Table 2
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	6
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	6-7
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	6-7
Generalisability	21	Discuss the generalisability (external validity) of the study results	7
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Title Page

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Disclaimers

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ABSTRACT

Background: We developed an intimate partner violence (IPV) educational program with the overarching goal of improving the preparedness of health care providers' (HCPs) to help patients who are victims of IPV. Our previously published study found significant improvements in HCPs' readiness to manage IPV at 3 months following completion of the educational training. This study sought to determine if similar improvements were observed at 12-months post-training.

Methods: We enrolled 140 participating HCPs from 7 fracture clinics in Canada and the United States and administered the Physician Readiness to Manage IPV Survey (PREMIS) before participants completed the educational program (baseline), immediately after training, and at 3months and 12 months post-training. In this study, we compared mean 12 month scores to mean baseline scores for each of the PREMIS subscales using linear regression models.

Results: We found statistically significant improvements among participating HCPs' actual knowledge about IPV 12 months after training. Statistically significant improvements from baseline to 12 months were also observed for 7 of the 9 other subscales of the PREMIS. These subscales included perceived preparation, perceived knowledge, preparation, legal requirements, workplace issues, self-efficacy, and practice issues.

Interpretation: The EDUCATE program led to significant improvements in HCPs' readiness to manage IPV, with positive changes being observed 12 months after training occurred. These findings indicate that HCPs who receive this training are better equipped to manage patients who have experienced IPV.

INTRODUCTION

Intimate partner violence (IPV) is defined by the World Health Organization as, "any behaviour within an intimate relationship that causes physical, psychological or sexual harm to those in the relationship" [1]. IPV can include acts of physical violence, sexual violence, emotional or psychological abuse, controlling behaviours, and stalking [10,11]. Previous research has shown that although there is a high prevalence of IPV among female patients visiting fracture clinics [2], health care providers (HCPs) working in fracture clinics often do not feel prepared to talk to potential victims about IPV [3,4,5].

To combat this lack of preparedness among HCPs working with fracture patients, an educational program, EDUCATE, was implemented at fracture clinic sites across Canada and the United States, and a study of the same name was conducted to determine the long-term impact of this educational program. The aim of the EDUCATE study was to determine if the educational program was successful in increasing HCPs knowledge about IPV and preparedness to discuss IPV with their patients, as assessed by the Physician Readiness to Manage IPV Survey (PREMIS) [6]. Our primary outcome was change in score on the survey for the actual knowledge subscale from before training to 3 months after training. Results from the 3-month evaluations were presented in a 2018 publication, which found significant improvement on the actual knowledge subscale 3 months after the training (mean difference [MD] 2.44, 95% confidence interval [CI] 1.79 to 3.09). Additionally, there were statistically significant improvements on 7 additional subscales 3 months after training [7].

Educational research suggests that in comparison to short-term knowledge retention, long-term retention is a more accurate indicator of actual learning [8]. Therefore, a secondary objective of this study was to determine if improvements in knowledge were maintained at 12 months following completion of the EDUCATE training. The objective of this paper is to present the long-term (12 month) follow-up data from the EDUCATE study.

METHODS

Program and Study Overview

A description of the EDUCATE program and study methodology have been previously published [7]. Briefly, we enrolled 140 participants (orthopedic surgeons, surgical trainees, non-physician HCPs and research and administrative staff) from 7 fracture clinics in North America who completed the 2-hour educational program. We used a pretest–posttest study design to assess knowledge, attitudes, beliefs and self-reported behaviours. We administered the PREMIS tool before, immediately after and at 3 months and 12 months after training and generated scores for each of the 10 PREMIS subscales. These subscales include: (a) perceived preparation to manage IPV, (b) perceived knowledge of important IPV issues, (c) actual knowledge, (d) preparation, (e) legal requirements, (f) workplace issues, (g) self-efficacy, (h) alcohol/drugs, (i) victim understanding, and (j) practice issues. The subscales were all used to determine the effectiveness of IPV training programs by assessing HCPs level of preparedness to assist patients who are experiencing IPV.

Statistical Analysis

Although no minimal clinically important difference (MCID) has been determined for the PREMIS, the MCID was estimated using half the standard deviation (SD). We chose to base our sample size upon this approximation because it has been found in previous research that half the SD is a reliable substitute for health-related quality of life measures [9]. We scored each PREMIS subscale based on the algorithm published by the developer. The changes in scores of all subscales from the PREMIS were entered as the dependent variable into multivariable linear regression models. Baseline score, age, sex, profession (orthopaedic surgeon vs student/resident/fellow vs allied health care professional vs research personnel), and previous IPV training (none vs any) were included as independent variables. A mean difference, reflecting the scores of all participants who completed the survey at baseline and 12 months after training, was calculated and presented with a 95% confidence interval (CI). The results of a pair *t*-test analysis were used to perform a sensitivity analysis for all outcomes; we present the mean scores from each subscale completed at baseline and 12 months after training. All tests conducted were 2-tailed and used an α level of 0.05. We did not adjust the overall level of significance for multiple testing since all analyses are exploratory. We used SAS software, version 9.4, to conduct all analyses.

RESULTS

Of the 140 HCPs who consented to participate in the EDUCATE training and corresponding study, 109 (79%) completed the 12-month follow-up PREMIS. The mean age of the participants was 36.7 (10.9) years and 67% of participants were male (**Table 1**). Almost two-thirds of participants were either orthopaedic surgeons (23.9%) or orthopaedic surgery residents (41.3%).

We found statistically significant improvements in participating HCPs' actual knowledge about IPV subscale 12 months after training (mean difference [MD] 2.50, 95% confidence interval [CI] 1.40 to 3.61). We also found statistically significant improvements at 12 months post-training in 7 of the 9 other subscales of the PREMIS as compared to baseline. These subscales included perceived preparation (MD 2.06, 95% CI 1.83 to 2.29), perceived knowledge (MD 2.14, 95% CI 1.91 to 2.36), preparation (MD 1.10, 95% CI 0.82 to 1.38), legal requirements (MD 1.57, 95% CI 1.27 to 1.87), workplace issues (MD 1.20, 95% CI 1.01 to 1.39), self-efficacy (MD 0.56, 95% CI 0.44 to 0.69), and practice issues (MD 6.12, 95% CI 4.85 to 7.40). We did not find statistically significant improvements in the drugs and alcohol and victim understanding subscales. Our sensitivity analysis, using paired t-tests, mirrored the above findings.

INTERPRETATIONS

The statistically significant improvements in HCPs' knowledge, attitudes, and behaviours related to IPV that were observed 3 months following completion of the EDUCATE training program were also observed 12 months after training. These finding suggest that HCPs working in fracture clinics who complete the EDUCATE program feel more prepared to identify and support women who visit their clinic having experienced IPV than before receiving training; moreover, these benefits prevail in the long-term. For 7 of the 10 PREMIS subscales (actual knowledge, perceived preparation, perceived knowledge, practice issues, preparation, legal requirements, workplace issues, self-efficacy), the improvement from baseline (as illustrated by the mean difference in scores) was greater at 12 months post-training than at 3 months post-training. The improvement in the alcohol/drugs subscale seen at 3 months was not present at 12 months.

Strengths and limitations to the overall EDUCATE program and corresponding study have been previously published [7]. Briefly, although an experimental design would produce higher quality

evidence, the pretest-posttest design is time-efficient, maximizes the number of trained HCPs and, in this case, it had no risk of contamination through the interactions between members of experimental and control groups. One limitation of the EDUCATE study is that we did not assess whether the participants completed all components of the training (the in-person component was mandatory). There is also the potential for testing bias, as the same PREMIS was administered at each assessment point; however, participants were never provided with the correct answers. Furthermore, because there are no established criteria for determining the MCID of the PREMIS, the results of this study are only clinically important. Additionally, there was notable loss-to-follow-up, with 79% of the participants completing the 12-month assessment upon which this analysis is based.

CONCLUSIONS

This study found that HCPs working in a fracture clinic setting who completed the EDUCATE program retain, and on some subscales, improve their IPV-related knowledge, beliefs, and opinions over the long-term. Although we cannot assume causality, these findings suggest that they are more prepared to address and assist victims of IPV who visit their clinics. Our findings, which are based on data collected from the PREMIS survey administered 12 months post-training, are consistent with those observed 3 months after receiving training. To further expand the reach of the program, the EDUCATE team has partnered with Canadian Orthopaedic Association to make the educational material available to HCPs across Canada. The program can be accessed at www.IPVeducate.com. Future research should be conducted to assess whether the EDUCATE program changes the behaviour of HCPs, and how this in turn may affect patient experiences.

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Table 1: Participant Characteristics

	Participants N (%) N=109
Demographics	
Age, mean (SD)	36.7 (10.9)
Sex, n (%)	
Female	36 (33.0)
Male	73 (67.0)
Race/ethnicity, n (%)	
White/Caucasian	86 (78.9)
Black (African/Caribbean)	1 (0.9)
Hispanic/Latino	0 (0.0)
South Asian	12 (11.0)
Native/Aboriginal	0 (0.0)
Middle Eastern	2 (1.8)
East Asian	6 (5.5)
Other	2 (1.8)
Professional Characteristics	
Health care profession, n (%)	
Orthopaedic surgeon	26 (23.9)
Physician	0 (0.0)
Physician assistant	4 (3.7)
Nurse practitioner	0 (0.0)
Nurse	8 (7.3)
Orthopaedic technician	7 (6.4)
Orthopaedic surgery resident	45 (41.3)
Orthopaedic surgery fellow	1 (0.9)
Student	1 (0.9)
Other	17 (15.6)
Years in Practice, median (IQR)	4 (2-12)
Years at current fracture clinic, median (IQR)	3 (1.5-6)
Number of patients treated per year, median (IQR)	1500 (725-3000)
Previous IPV Training	
Hours of Previous IPV training, n (%)	
0	50 (45.9)
1-5	52 (47.7)
6-15	7 (6.4)
More than 15	0 (0.0)
Type of Previous IPV training, n (%)	
Watched a video	21 (19.3)
Attended a lecture/talk	50 (45.9)
Attended skills-based training workshop	7 (6.4)
Completed online training	7 (6.4)
Other	5 (4.6)

Setting of Previous IPV training	
Medical or professional school	28 (25.7)
Residency/placement/internship	13 (11.9)
Workplace	14 (12.8)
Professional education	11 (10.1)
Other	6 (5.5)

Table 2: PREMIS at 12 Months Post-Training

	Baseline Mean (SD)	12-Months Mean (SD)	Multivariable linear regression model	Paired t-test
			Mean Difference (95% CI)	Mean Difference (95% CI)
Actual Knowledge	26.59 (4.92)	29.09 (4.66)	2.50 (1.69, 3.32)	2.50 (1.40, 3.61)
Perceived Preparation	2.60 (1.08)	4.66 (1.15)	2.06 (1.88, 2.24)	2.06 (1.83, 2.29)
Perceived Knowledge	2.70 (1.12)	4.84 (1.05)	2.14 (1.96, 2.31)	2.14 (1.91, 2.36)
Opinion Scales				
Preparation	3.73 (1.25)	4.83 (0.90)	1.10 (0.94, 1.26)	1.10 (0.82, 1.38)
Legal Requirements	3.38 (1.52)	4.94 (1.16)	1.57 (1.36, 1.78)	1.57 (1.27, 1.87)
Workplace issues†	3.04 (0.95)	4.24 (0.88)	1.19 (1.04, 1.35)	1.20 (1.01, 1.39)
Self-Efficacy	3.56 (0.46)	4.12 (0.61)	0.56 (0.46, 0.67)	0.56 (0.44, 0.69)
Alcohol/drugs	4.22 (0.57)	4.34 (0.52)	0.11 (0.02, 0.21)	0.11 (-0.02, 0.25)
Victim Understanding	4.97 (0.70)	4.92 (0.70)	-0.05 (-0.16, 0.07)	-0.05 (-0.18, 0.09)
Practice Issues	5.81 (6.46)	11.94 (7.26)	6.12 (4.97, 7.27)	6.12 (4.85, 7.40)

† N=108. One patient is missing all of the questions that are part of the Workplace Issues domain.

Appendix 1: Authorship

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authors critically revised the manuscript, gave final approval of the version to be published and agreed to act as guarantors of the work.