

# Effect of domestic violence training

## Systematic review of randomized controlled trials

Eman Zaher MBBS MPH Kelly Keogh MD MHSc Savithiri Ratnapalan MBBS MEd FRCPC FAAP

### Abstract

**Objective** To describe and evaluate the effectiveness of domestic violence education in improving physicians' knowledge, recognition, and management of abused women.

**Data sources** The Cochrane Database of Systematic Reviews, MEDLINE, PubMed, PsycINFO, ERIC, and EMBASE were searched for articles published between January 1, 2000, and November 1, 2012. This search was supplemented by manual searches for relevant articles using a combined text-word and MeSH-heading search strategy.

**Study selection** Randomized controlled trials were selected that used educational interventions among physicians and provided data on the effects of the interventions.

**Synthesis** Nine randomized controlled trials were included that described different educational approaches with various outcome measures. Three studies examined the effects of educational interventions among postgraduate trainee physicians and found an increase in knowledge but no change in behaviour with regard to identifying victims of domestic violence. Six studies examined educational interventions for practising physicians. Three of these studies used multifaceted physician training that combined education with system support interventions to change physician behaviour, such as increasing general awareness of domestic violence with brochures and posters, providing aids to remind physicians how to identify victims, facilitating physician access to victim support services, and providing audits and feedback. Multifaceted educational interventions included interactive workshops, Web-based learning, and experiential training. Another study used focus-group discussions and training, and showed improved domestic violence reporting among physicians. The remaining 2 studies showed improved perceptions of practising physicians' self-efficacy using problem-based online learning.

**Conclusion** It was difficult to determine the most effective educational strategy, as the educational interventions and the outcome measures varied among the selected studies. Brief interventions for postgraduate trainee physicians improved knowledge but did not seem to affect behaviour. Online education using a problem-based learning format improved practising physicians' perceptions, knowledge, and skills in managing domestic violence. Physician training combined with system support interventions seemed to benefit domestic violence victims and increase referrals to domestic violence support resources.

Domestic violence is a global health issue that creates serious health problems and has long-term emotional, psychological, and physical effects on victims and families.<sup>1,2</sup> Domestic violence, also known as intimate partner violence (IPV), is defined by the World Health Organization as "any act of physical, sexual, or emotional abuse by a current or former partner, whether cohabiting or not."<sup>3</sup> Domestic violence is a universal problem that is poorly identified, acknowledged, and addressed.<sup>3-7</sup>

### EDITOR'S KEY POINTS

- This review found multifaceted education and institutional or systemic changes to be effective in improving practising physicians' behaviour for both reporting and referrals for domestic violence. Domestic violence workshops for postgraduate trainee physicians did not produce a meaningful effect on their behaviour in identifying victims of domestic abuse.
- Online problem-based learning seems to increase physicians' perceived self-efficacy in treating domestic violence.
- Physician training combined with system support interventions, such as increasing awareness of domestic violence, reminders for victim identification, and improved access to support services, seems to benefit domestic violence victims and increase referrals to domestic violence resources.



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## DATA SOURCES

According to the World Health Organization, domestic violence has reached epidemic proportions in many societies, with 15% to 71% of women in various countries experiencing physical or sexual violence—or both—at some point in their lives.<sup>8,9</sup> Health care providers perceive difficulties in dealing with victims of abuse owing to several factors including time constraints, lack of training, and limited access to domestic violence resources.<sup>5,6,10</sup>

During the past decade, there has been some progress in implementing domestic violence training programs for physicians and other health care providers, with the goal of improving their ability to manage victims of abuse.<sup>11</sup> However, considerable international controversy remains about whether to routinely screen women for domestic violence, particularly when resources are limited. While the recent United States Preventive Services Task Force guidelines<sup>12</sup> recommend screening asymptomatic women of childbearing age for signs of domestic violence and referring those who need treatment to the appropriate agencies, the Canadian Task Force on Preventive Health Care has found insufficient evidence for or against routine screening for domestic violence among women.<sup>13</sup> Nevertheless, research shows that physicians face challenges when implementing domestic violence preventive measures because of inadequate multidisciplinary staff training, as well as lack of time, experience, awareness of community resources, and availability of effective interventions to support women and protect them from further abuse.<sup>14-16</sup> Research on the effectiveness of domestic violence education in postgraduate and continuing medical education (CME) activities suggests that such activities improve physicians' knowledge and attitudes about domestic violence but casts doubt on whether such activities affect patient outcomes.<sup>11,17,18</sup>

The objective of this systematic review is to describe and evaluate the effects of domestic violence educational interventions among physicians. The focus, scope, target population, and key questions were determined using the standard approach, the PICO (population, intervention, comparison, outcome) method.<sup>17-21</sup> The target population includes postgraduate trainee physicians and practising physicians from all specialties who received CME or continuing professional development on identifying and managing domestic violence. The intervention is any educational program that involves training physicians in IPV or domestic violence compared with no intervention. The outcome measures include learner satisfaction, change in knowledge or attitude, change in behaviour, and effect at the patient level (ie, greater number of domestic violence cases identified and referred to intervention programs).

In conjunction with a research librarian, electronic databases and gray literature were searched. The primary search was performed using the following databases: the Cochrane Database of Systematic Reviews, MEDLINE, PubMed, PsycINFO, ERIC, and EMBASE. These were searched for articles published between January 1, 2000, and November 1, 2012. Search terms for electronic databases included medical subject headings, controlled vocabulary, free-text words, key terms, and key words such as *physicians, doctors, residents, continuing medical education, postgraduate, educational programs, intimate partner violence, domestic abuse, domestic violence, physical, sexual, psychological, violence, abuse, spouse abuse, and partner abuse*.

## Study selection

For inclusion, studies needed to meet the following criteria (**Table 1**): they must have been published in the English language; they must have been published within the past 12 years to update the review by Davidson et al in 2001<sup>22</sup>; the target population must have included physicians from any specialty; study designs must have been randomized controlled trials (RCTs); and interventions had to be aimed at influencing professional practice at any level of the Kirkpatrick model for evaluating training effectiveness.<sup>23</sup> Regarding the latter criterion, points of influence of the model might include learner satisfaction or reaction; knowledge or learning outcomes; performance or behaviour; and patient outcomes or results for consumers.<sup>23</sup>

The initial search identified 350 articles. Titles and abstracts were examined for relevance, and entire studies were reviewed if abstracts were not clear. A total of 25 articles were identified as potentially eligible for inclusion (**Figure 1**). When results were combined, 11 articles were duplicated, and 3 were excluded because they did not meet the study inclusion criteria. Thus, 7 studies were identified as eligible. The references and citations of the retrieved articles were manually searched, and 2 additional RCTs were identified, to provide a total of 9 studies in this review. Descriptive methods were used to summarize the results owing to heterogeneity of the included studies with respect to study quality, setting, target population, educational intervention, and outcomes assessed.

**Validity assessment.** The quality of included studies was independently appraised by 3 reviewers (E.Z., K.K., S.R.) using the following criteria from the *Cochrane Handbook for Systematic Reviews of Interventions*: selection bias, performance bias, detection bias, attrition bias, and reporting bias.<sup>24</sup> Any disagreements between

**Table 1. Inclusion criteria for primary studies**

| TYPE                        | DESCRIPTION  |
|-----------------------------|--|
| Population                  | Postgraduate physicians (ie, residents or practising physicians from any specialty)  |
| Intervention                | Any IPV or domestic violence educational program, course, or training that involves a multidisciplinary group of health care providers or physicians only  |
| Outcome (Kirkpatrick model) | <ul style="list-style-type: none"> <li>• Learner satisfaction or reaction</li> <li>• Change in physicians' knowledge of, attitudes toward, or learning outcomes toward IPV</li> <li>• Change in physicians' performance or behaviour (ie, case finding, screening, documentation, and referral to IPV resources)</li> <li>• Patient outcomes or results for consumers and organizations (cost-effectiveness, improved quality of life among abused victims)</li> </ul> |
| Study                       | Randomized controlled trial  |
| Language                    | English  |
| Time                        | From January 1, 2000, to November 1, 2012  |

IPV—intimate partner violence.

the first 2 reviewers (E.Z., K.K.) were resolved through consultation with the third reviewer (S.R.). Each study was assigned 1 of 3 ratings according to the *Cochrane Handbook for Systematic Reviews of Interventions*<sup>24</sup>: low risk of bias (A), moderate risk of bias (B), or high risk of bias (C).

**Risk of bias.** Of the 9 studies, 2 were rated as A, high quality with low risk of bias<sup>25,26</sup>; 2 were rated as B, moderate quality with a moderate risk of bias<sup>27,28</sup>; and the remaining were rated as C, low quality with high risk of bias.<sup>29-33</sup> Concealment and protection against contamination was done in 3 studies.<sup>25,26,28</sup> Blinded assessment of primary outcomes was done in 3 studies.<sup>25,27,28</sup> Reliable primary and secondary outcome measures were used in all the studies.<sup>25-33</sup>

## SYNTHESIS

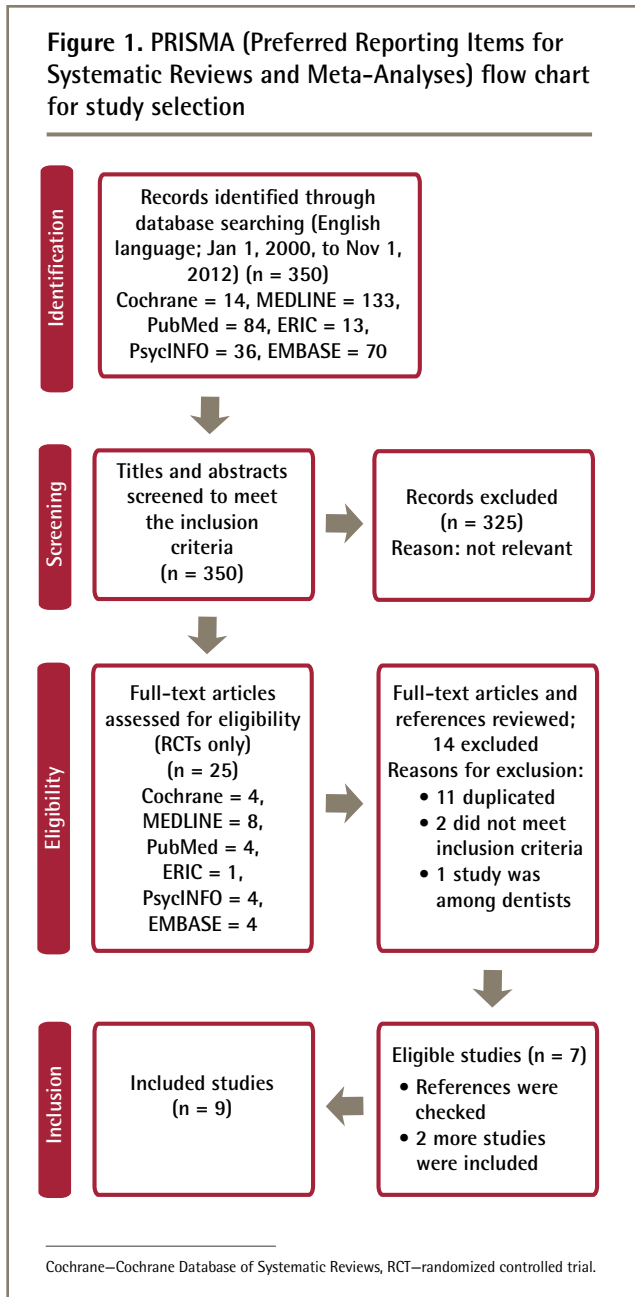
Of the 9 studies included in this review (**Table 2**),<sup>25-33</sup> 3 targeted postgraduate trainees.<sup>27,29,31</sup> Workshops and brief seminar sessions that used videotapes and role-playing substantially improved knowledge about domestic violence, but did not result in a change in resident physicians' behaviour or attitudes toward domestic violence.<sup>27,31</sup> Adding shelter experience (in which residents attended a weekly shelter meeting for IPV survivors) to the IPV workshop was found to have a modest effect on knowledge gain ( $P=.04$ ) about IPV when compared with the instructional approach.<sup>31</sup> The use of standardized patients did not result in correct identification of IPV cases by residents in the intervention group, but resulted in higher scores on a proficiency checklist ( $P=.036$ ) and in safety plan counseling proficiency ( $P=.04$ ).<sup>29</sup>

Six studies targeted practising physicians.<sup>25,26,28,30,32,33</sup> In 3 studies, physicians and other health professionals received training, in addition to system support, to

improve IPV screening and management.<sup>25,28,32</sup> These system support activities attempted to increase general awareness of domestic violence by having posters and brochures about domestic violence in waiting areas, as well as providing aids such as cue cards for health professionals, checklists in medical records for domestic violence diagnosis, and information on accessing services and referral for managing patients. There were substantial and sustained improvements in staff knowledge and attitudes about domestic violence and self-reported practice after using the system-based learning approach.<sup>28,32</sup> Patient outcomes improved in all 3 studies.<sup>25,28,32</sup> In the study by Feder et al,<sup>25</sup> training of primary care clinicians, along with system support, resulted in increased identification of victims of domestic violence and increased referrals to specialist domestic violence agencies and advocacy programs. This increase was sustained when evaluated 12 months after the second training session (adjusted intervention rate ratio 22:1). Disclosure reporting of domestic violence in the general practice electronic medical record increased substantially in the intervention practices ( $n=641$ ) compared with control practices ( $n=236$ ) (adjusted intervention rate ratio 3:1).<sup>25</sup> The rate of asking about domestic violence also increased by 14.3% in one study.<sup>28</sup> In another study, the implementation of a system support approach did not result in a statistically significant increase in rates of identifying victims of domestic violence ( $P=.52$ ), but patient satisfaction was higher ( $P<.001$ ) after the intervention.<sup>32</sup>

Online CME about domestic violence was assessed in 2 RCTs,<sup>30,33</sup> in which problem-based learning approaches were used and before-and-after surveys were conducted to evaluate perceived knowledge, attitude, and behaviour changes, including physician self-efficacy and reported IPV management practices during the study period. Online education about domestic violence resulted in a 17.8% mean improvement in

**Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow chart for study selection**



## DISCUSSION

This systematic review suggests that physicians' knowledge about domestic violence can be substantially improved through educational interventions that involve physicians' active participation and experiential learning. Some studies have shown that interactive workshops change clinicians' attitudes and performance and influence their everyday practices for managing victims of domestic violence.<sup>34-36</sup> On the other hand, domestic violence workshops for postgraduate trainee physicians did not produce a meaningful effect on their behaviour in identifying victims of domestic abuse.<sup>26,27,30,31</sup> Domestic violence identification and management is not a 1-step process; identification itself can have multiple and complex consequences such as finding a shelter for the victim, making arrangements for the children, and sometimes finding help for the abuser. The identification and management of domestic violence can be an emotional experience not only for the patient but also for the provider, and some studies have called for more than a brief intervention to improve physicians' abilities to identify and manage cases of domestic violence.<sup>37,38</sup>

The use of standardized patients in domestic violence training among postgraduate physicians improved their knowledge and skills, and led to more reported cases of domestic violence.<sup>39</sup>

Previous systematic reviews show that e-learning can improve physicians' knowledge and skills, and can produce more sustained behavioural change compared with workshops.<sup>37,40,41</sup> In this systematic review, 2 RCTs that used interactive, Web-based domestic violence modules resulted in significant improvement in physicians' knowledge and self-efficacy to diagnose and deal with domestic violence cases.<sup>30,33</sup> However, the long-term effects on physicians' actual behaviour and patient health care outcomes, as well as the cost-effectiveness of the e-learning domestic violence modules, need to be assessed by future RCTs. Further, promoting online CME on domestic violence to physicians requires resources and social media marketing strategies that need to be considered when designing such programs.<sup>42</sup>

This review found multifaceted education and institutional or systemic changes to be effective in improving physicians' behaviour toward domestic violence reporting and referrals. This approach also increased patient satisfaction and was found to be cost-effective and possibly cost-saving from a social perspective.<sup>32,43</sup> Essential elements of effective education were multidisciplinary training for physicians with reinforcement sessions, along with additional training for team leaders and champions. System-based interventions for physicians were cues to remind physicians to ask about abuse in situations where it was likely to be an underlying cause of a

the self-efficacy domain score ( $P < .001$ ) in the study by Harris et al.<sup>30</sup> Substantial improvement in 8 of 10 knowledge, attitude, and behaviour outcome measures, including physician self-efficacy and reported IPV management practices during the study period, was demonstrated in the other study.<sup>33</sup>

Focus-group discussions about IPV among family physicians were assessed by Lo Fo Wong et al in a 2-level intervention RCT.<sup>26</sup> The high-grade intervention, which consisted of 1.5 days of IPV training in addition to 6 focus-group discussions about IPV, resulted in a significantly increased number of reported IPV cases (rate ratio 4.54).<sup>26</sup>

**Table 2. Study descriptions and outcomes**

| STUDY AND SETTING OR PARTICIPANTS  | NO. OF PARTICIPANTS  |   | DESCRIPTION OF INTERVENTION  | OUTCOME MEASURES  | RESULTS   |
|--|--|---|--|---|---|
|  | INTERVENTION   | CONTROL                                   |  |   |   |
| Feder et al (2011, UK) <sup>25</sup><br>2 urban primary care trusts                            | 24 practices<br>System-based intervention: IRIS program                | 24 practices<br>No IRIS program           | <ul style="list-style-type: none"> <li>Interactive multidisciplinary DV training</li> <li>Template in the EMRs linked to common diagnosis in DV patients</li> <li>DV cards</li> <li>Simplified referral to DV advocate</li> </ul>          | <ul style="list-style-type: none"> <li>No. of referrals of women in the EMRs to DV agencies</li> <li>Identification of DV patients in EMRs</li> <li>Referral of women registered in practices in study</li> <li>Measurement of clinician preparation, knowledge, and self-reported practices with regard to DV</li> </ul> | <ul style="list-style-type: none"> <li>No. of referrals to DV agencies recorded in EMRs in the intervention practices was 21 times larger than that recorded in the control practices (adjusted intervention rate ratio=22:1)</li> <li>DV disclosures in intervention practices were 641 vs 236 in control practices (adjusted intervention rate ratio=3:1)</li> <li>The program was cost-effective</li> <li>Advocacy was recognized as essential</li> <li>No adverse events reported</li> </ul>  |
| Lo Fo Wong et al (2006, Netherlands) <sup>26</sup><br>Family practices                         | 38<br>FG discussions about DV and DV training                          | 17<br>No DV training                      | <ul style="list-style-type: none"> <li>Low-grade intervention: 6 FG discussions on IPV led by a qualified social scientist</li> <li>High-grade intervention: 6 FG discussions and 1.5 d of training (9 CME credits)</li> </ul>             | <ul style="list-style-type: none"> <li>No. of reported IPV cases</li> <li>No. of cases with non-obvious signs to suspect or discuss partner abuse</li> </ul>  | <p>Full training produced significant improvement in IPV detection (rate ratio = 4.54).</p> <ul style="list-style-type: none"> <li>Comparison of the FG-only intervention with the control group resulted in a rate ratio of 2.20</li> <li>Comparison of the full-training and FG-only groups resulted in a rate ratio of 2.19</li> <li>Comparison of the full-training group with both untrained groups for awareness of partner abuse in case of non-obvious signs resulted in an OR of 5.92</li> </ul>   |
| Coonrod et al (2000, US) <sup>27</sup><br>Residents (multiple programs)                        | 53<br>Brief video and role-playing about DV                            | 49<br>No DV education                     | <ul style="list-style-type: none"> <li>Intervention in 1995: 20-min videotape about DV</li> <li>Intervention in 1996: 20-min program (9-min videotape and role-playing that demonstrated interview techniques for detecting DV)</li> </ul> | <ul style="list-style-type: none"> <li>Self-reported diagnosis of a case of DV between the intervention and the follow-up 9-12 mo after the intervention</li> <li>Knowledge change was assessed via 5 true-false questions, administered before and after the intervention</li> </ul>                                     | <ul style="list-style-type: none"> <li>Intervention residents were 35% more likely than control residents to diagnose DV (RR = 1.35; 95% CI 0.96 to 1.90) but the result was not significant</li> <li>Significant improvement in knowledge was noted among intervention residents (<math>P=.002</math>)</li> </ul>  |
| Thompson et al (2000, US) <sup>28</sup><br>Multidisciplinary teams from 5 primary care clinics | 91<br>System-based intervention based on behaviour change model for DV | 88<br>No system-based intervention for DV | <ul style="list-style-type: none"> <li>2 half-day training sessions with extra training for designated leaders</li> <li>Bimonthly newsletter</li> <li>Clinical DV educational rounds</li> <li>System support</li> <li>Feedback</li> </ul>  | <ul style="list-style-type: none"> <li>Providers' KAB</li> <li>Provider ratings of intervention components at 8-9 mo</li> <li>DV case finding at visits for injury, depression, chronic pelvic pain, or physical examination</li> <li>Assessment of management plans for victims</li> </ul>                               | <ul style="list-style-type: none"> <li>Improved provider KAB outcomes up to 21 mo after program initiation and improved process of care (asking) outcomes at 9 mo</li> <li>Overall DV case finding increased by 30% (OR = 1.3; not statistically significant)</li> <li>Documented asking about DV was increased by 14.3% with a 3.9-fold relative increase at 9 mo in intervention clinics compared with control clinics</li> <li>Recorded quality of DV patient assistance did not change</li> </ul>   |
| Haist et al (2007, US) <sup>29</sup><br>Internal medicine residents                            | 14<br>Interactive DV workshop (2 h) using SPs                          | 13<br>Chronic pain workshop               | <ul style="list-style-type: none"> <li>DV workshop discussion about DV background, signs of abuse, methods of screening for DV, elements of a safety plan, and state law requiring reporting</li> </ul>                                    | <ul style="list-style-type: none"> <li>Trainee skills in DV management</li> <li>DV identification</li> <li>Checklist proficiency</li> <li>Safety plan counseling proficiency</li> </ul>   | <ul style="list-style-type: none"> <li>Insinuated SPs with DV case scenarios were not identified more frequently by DV workshop residents than by chronic pain workshop residents: 16 of 25 (64%) vs 13 of 23 (56%) (<math>P=.86</math>, OR = 1.12, 95% CI 0.35 to 3.59)</li> <li>Residents in the intervention group recorded <math>\geq 75\%</math> higher scores on the checklist than residents in the control group did (<math>P=.036</math>, OR = 5.90, 95% CI 1.12 to 31.2)</li> <li>There was no significant difference in the rate of identification of DV in SPs programmed with DV scenarios by residents completing DV workshops compared with those completing workshops on chronic pain (64% vs 56%, <math>P=.86</math>, OR = 1.12, 95% CI 0.35 to 3.59)</li> </ul> |

Table 2 continued on page 623

Table 2 continued from page 622

| STUDY AND SETTING OR PARTICIPANTS   | NO. OF PARTICIPANTS   |   | DESCRIPTION OF INTERVENTION  | OUTCOME MEASURES  | RESULTS  |
|---|---|---|--|---|--|
|   | INTERVENTION  | CONTROL   |  |   |  |
| Harris et al (2002, US) <sup>30</sup><br>Practising physicians in Kansas                  | 50<br>Online CME  | 49<br>No online CME   | <ul style="list-style-type: none"> <li>Interactive case-based scenarios</li> </ul>   | <ul style="list-style-type: none"> <li>Change in physicians' confidence to manage DV patients</li> </ul>  | <ul style="list-style-type: none"> <li>There was a mean increase (17.8%) in the self-efficacy domain score for the intervention group versus a decrease (0.6%) in the control group (<math>P &lt; .001</math>)</li> <li>Significant changes in 5 other domain scores</li> <li>No evaluation of physicians' actual behaviour</li> <li>Long-term changes in knowledge and attitudes were not assessed</li> </ul>   |
| Brienza et al (2005, US) <sup>31</sup><br>University-based internal medicine residents    | 22 residents<br>DV training workshop                        | 22 residents<br>DV training workshop and women's shelter experience | <ul style="list-style-type: none"> <li>All residents participated in a 90-min IPV workshop that included didactic learning, videos, and role-playing</li> <li>Intervention residents received shelter experience (visiting a local women's safe shelter, and attending a weekly meeting of IPV survivors)</li> </ul> | <ul style="list-style-type: none"> <li>Change in scores on IPV knowledge, skills, attitudes, and resource awareness subscales</li> </ul>  | <ul style="list-style-type: none"> <li>Intervention residents had a significantly greater improvement in the knowledge subscale (<math>P = .04</math>)</li> <li>No significant differences between intervention and control groups for change in the skill, attitude, and resource awareness composite subscales (<math>P = .3</math>, <math>P = .9</math>, and <math>P = .8</math>, respectively)</li> <li>Intervention residents self-reported more screening for IPV in women with "red-flag" presentations but this did not achieve statistical significance</li> </ul>                    |
| Campbell et al (2001, US) <sup>32</sup><br>12 hospital EDs in Pennsylvania and California | 330<br>System-based intervention                            | 319<br>No system-based intervention                                 | <ul style="list-style-type: none"> <li>2-d training and planning program</li> <li>Multidisciplinary team training approach (physician, nurse, social worker, administrator, and local DV advocate)</li> </ul>  | <ul style="list-style-type: none"> <li>Change in ED culture about IPV</li> <li>Change in ED personnel knowledge of IPV and attitudes toward victims of DV</li> <li>Rate of identification of victims of DV and prevalence of IPV</li> <li>Patient satisfaction</li> </ul> | <ul style="list-style-type: none"> <li>The intervention EDs had significantly higher summary scores on all components of the culture criteria (<math>P = .04</math>)</li> <li>The intervention hospitals scored significantly higher than the control hospitals on a staff knowledge and attitude measure (<math>P = .019</math>)</li> <li>There was no significant difference in the rates of identifying victims of DV (<math>P = .52</math>)</li> <li>Patient satisfaction: intervention hospitals scored significantly higher (<math>P &lt; .001</math>) after the intervention</li> </ul> |
| Short et al (2006, US) <sup>33</sup><br>Community physicians in different specialties     | 44<br>Asynchronous online IPV teaching program (4 h of CME) | 37<br>No online IPV teaching program                                | <ul style="list-style-type: none"> <li>Multimedia, interactive clinical cases</li> <li>Audio, video, and text-based materials</li> </ul>   | <ul style="list-style-type: none"> <li>IPV background</li> <li>Actual knowledge</li> <li>Opinions</li> <li>Practice issues (self-reported)</li> </ul>   | <ul style="list-style-type: none"> <li>Online IPV CME program produced a substantial improvement in 8 of 10 KAB outcomes during the study period</li> <li>Opinion scale related to alcohol or drugs and IPV did not significantly change (<math>P = .445</math>)</li> <li>Self-reported IPV management practices (behaviour) following the program were not assessed</li> </ul>  |

CME—continuing medical education, DV—domestic violence, ED—emergency department, EMR—electronic medical record, FG—focus group, IPV—intimate partner violence, IRIS—Identification and Referral to Improve Safety, KAB—knowledge, attitude, and behaviour, OR—odds ratio, RR—relative risk, SP—standardized patient, UK—United Kingdom, US—United States.

particular diagnosis; improved access to support services; and continuous audits and feedback.<sup>44</sup> In one study, an interesting finding was the lack of effect of system-based interventions on physicians' ability to identify victims of abuse.<sup>32</sup> These findings might have also been influenced by the women's reluctance to report abuse.

### Limitations

There were limitations to this review such as the small number of studies, the heterogeneity of the interventions and outcome measures, the limiting of the search to English-language articles, and the fact that unpublished RCTs could not be searched or included, thus raising

the possibility of missing some important literature. On the other hand, the use of a validated search strategy to identify the eligible studies minimized the chance of missing relevant articles.

### Conclusion

It was difficult to determine the most effective educational strategy from this review, as the educational interventions varied in delivery methods, duration, and outcome measures used for evaluation. Online problem-based learning seems to increase physicians' perceived self-efficacy in treating domestic violence. Physician training combined with system support interventions,

such as increasing awareness of domestic violence, reminders for victim identification, and improved access to support services, seem to benefit domestic violence victims and increase referrals to domestic violence resources.

**Dr Zaher** is a staff family physician at Prince Sultan Military Hospital in Saudi Arabia. **Dr Keogh** is a pediatric emergency physician at the Hospital for Sick Children in Toronto, Ont. **Dr Ratnapalan** is Associate Professor in the Department of Paediatrics and the Dalla Lana School of Public Health at the University of Toronto and a staff physician in the Division of Emergency Medicine, Clinical Pharmacology, and Toxicology at the Hospital for Sick Children.

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**Contributors**

All authors contributed to the literature search, analysis and interpretation of the data, and preparing the manuscript for submission.

**Competing interests**

None declared

**Correspondence**

**Dr Savithiri Ratnapalan**, Division of Emergency Medicine, Clinical Pharmacology, and Toxicology, Hospital for Sick Children, 555 University Ave, Toronto, ON M5G 1X8; telephone 416 813-7532; fax 416 813-5043; e-mail [savithiri.ratnapalan@sickkids.ca](mailto:savithiri.ratnapalan@sickkids.ca)

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