

## Can Internet-based Education Improve Physician Confidence in Dealing With Domestic Violence?

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**Background and Objectives:** *Domestic violence (DV) is a common, under-recognized source of visits to health care professionals. Even when recognized, physicians are reluctant to deal with DV, citing a lack of education and lack of confidence in addressing issues presented by DV patients. Only a small number of DV education programs have been shown to lead to improvements in professional knowledge and confidence, and these are intensive, multi-day courses. We sought to develop an on-line DV education program that could achieve improvements in physician confidence and attitudes in managing DV patients comparable to classroom-based courses. **Methods:** We created an interactive, case-based DV education program targeted to physicians caring for DV patients. We tested the effectiveness of this program in changing attitudes and beliefs in a randomized, controlled trial of Kansas physicians who volunteered to participate in a study of on-line continuing medical education. We measured program effectiveness with an externally developed and validated pretest/posttest instrument. **Results:** Sixty-five physicians completed the pretest/posttest, 28 of whom were assigned to receive the on-line DV program. We found a +17.8% mean change in confidence (self efficacy) for physicians who took the DV program versus a -.6% change for physicians who did not take the program. We also found improvements in other important areas associated with poor management of DV patients. These changes were similar or greater in magnitude to those reported by others who have used the same survey tool to evaluate an intensive, multi-hour classroom approach to DV education. User satisfaction with the on-line program was high. **Conclusions:** An interactive, case-based, on-line DV education program that teaches problem-solving skills improves physician confidence and beliefs in managing DV patients as effectively as an intensive classroom-based approach. Such programs may be of benefit to those seeking to improve their personal skills or their health care delivery system's response to DV.*

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There is ample documentation that domestic (or intimate partner) violence (DV) is a frequent, yet under-recognized cause of visits to health care professionals.<sup>1</sup> The societal cost of failing to address DV issues is enormous. Victims of abuse are at increased risk of injury, death, and a number of somatic and mental health conditions that impair their lives and increase their use of health care resources.<sup>1-4</sup> Moreover, children who witness violent acts are more prone to develop long-term physical and mental health problems.<sup>5</sup>

Unfortunately, physicians and other health professionals do not screen for DV in their patients<sup>6</sup> and may avoid dealing with issues raised by DV, even when it is recognized.<sup>7</sup> This reluctance is often based on concerns of retaliation, police involvement, time pressures, cultural differences, lack of trust, and, importantly, lack of knowledge and confidence in managing these difficult situations.<sup>8-10</sup>

We believe, as do many others, that a successful strategy for addressing the needs of DV patients requires a comprehensive multidisciplinary systems approach, not a piecemeal solution. Improvements in health professional education are one necessary component of such a systems-based strategy.<sup>6,11</sup> Ideally, the DV educational component of a larger DV strategy should enable health professionals to address the needs of DV patients with

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greater confidence and an improved knowledge of resources and medical-legal issues associated with DV. A useful program should also be easily distributed throughout an organization, recognizing the conflicting demands on professional (or student) time as well as organizational resources.

Medical schools and academic centers are paying increasing attention to the need for violence and abuse training in their curricula.<sup>12</sup> Family practice residencies are also providing more DV education, approximately 4–5 hours per year.<sup>13</sup> Unfortunately, few DV education programs have undergone any type of evaluation. It is unlikely that brief didactic programs, which may do little harm, actually do any good.<sup>14</sup> In contrast, extensive, multi-day DV education programs have been shown to increase knowledge and confidence in medical students<sup>15</sup> and practicing health professionals.<sup>16</sup> However, such programs are resource intensive and difficult to reproduce.

We have previously shown that an interactive, computer-based education program distributed via the Internet can improve the confidence, knowledge, and clinical skills of practicing physicians and physicians in training in managing pigmented skin lesions.<sup>17,18</sup> This skin cancer program, based on well-established concepts of adult learning theory, emphasized a user-driven, problem-solving approach rather than a didactic presentation of skin cancer facts and tests of memory recall. We wished to determine whether a similarly designed program could improve the confidence of practicing physicians in managing DV patients. If a brief, inexpensive, on-line DV education program can provide benefits comparable to extensive multi-day “clerkships” in DV, then the use of this type of educational approach may enable academic centers, residency programs, and health care delivery organizations to improve their educational strategies and overall systems for managing DV patients without substantial investments in new programs or in student time.

## Methods

### *Educational Program Development*

We developed our DV educational program around a series of case studies in which different aspects of DV were gradually revealed as the user worked through the case. The interactive case-based scenarios emphasized clinical aspects of DV as it might appear in a family practice office: DV during pregnancy, DV in older persons, DV within a family presenting with somatic complaints in a child, and dealing with the DV perpetrator. Users were asked to respond to typical clinical questions, ranging from “What tests would you now order during this routine pregnancy?” to “Would you recommend family counseling for the victim and her batterer?” Users were provided discussions of correct and incorrect answers, with no penalty for selecting an incorrect response. The program also provided links to

on-line DV resources and electronically transferable materials (“enablers”) that physicians could use in their practices. Additionally, the program provided geographically specific information on the locations of local shelters and support groups and the state-mandated DV reporting requirements for health providers.

The specific objectives of the on-line DV program were to (1) increase physicians’ ability to recognize victims of DV by increasing their use of office-based screening tools, (2) improve physicians’ knowledge of risk assessment techniques, (3) improve medical record documentation of recognized cases of DV, (4) increase physicians’ self efficacy in managing DV victims, and (5) increase physicians’ self efficacy in managing DV perpetrators.

### *Program Deployment*

We created the on-line DV program using standard Web-authoring tools, including Macromedia Cold Fusion<sup>®</sup> and Microsoft SQL Server.<sup>®</sup> By using a database-driven (versus a static hypertext mark-up language [HTML]) approach, we were able to provide customized responses to user input.

The program was presented to the study subjects via a private Web site, which was maintained by a commercial continuing medical education (CME) publishing company. Although available via the Internet, access to the test program was restricted to study participants who were assigned to the intervention group by use of predefined user ID/password combination. Once subjects entered the identification/password, they were instructed to enter additional identifying information and create a unique individual identification/password.

### *Study Population*

Study subjects were practicing Kansas physicians who had not received more than 1 hour of CME instruction in DV during the prior year and who responded to an invitation to participate in a study of on-line DV education sent by the Johnson/Wyandotte Counties (Kansas) Medical Society. In total, we sent invitations via fax to 1,887 physicians (distributed throughout the state) who were members of the Kansas Medical Association and were practitioners of a primary care specialty or members of certain specialties likely to care for DV patients (eg, emergency medicine and orthopedics). Those who agreed to participate and met the eligibility criteria were provided a \$50 honorarium for completing two surveys of DV attitudes and beliefs. If the participants were randomized to the intervention (on-line education) group, they were offered an additional \$50 honorarium and 2 hours of American Academy of Family Physicians Prescribed CME Credit for completing the on-line education program. All eligible participants who completed both surveys comprised the study population.

### Outcome Measures

Our primary study hypothesis was that physicians who were assigned to receive the on-line DV program would have a greater change in their confidence in managing DV patients (self efficacy), as measured by a self-reported survey instrument, than would a control group that did not receive the program. We also hypothesized that the on-line program would reduce inhibiting beliefs and attitudes (eg, fear of offending the patient, blaming the victim, and safety concerns) previously documented as obstacles to physician intervention with DV patients.<sup>7</sup>

We measured subjects' DV attitudes and beliefs with a survey instrument developed at the University of Washington<sup>19</sup> that has been demonstrated to be a reliable and valid measure in studies of DV educational programs.<sup>16</sup> The initial survey instrument contained 39 items that measured six DV domains: provider self efficacy, perceived systems support, victim blaming, fear of offense, safety concerns, and perceived frequency of asking about DV. Cronbach alphas for the instrument ranged from .73–.91, indicating excellent inter-item reliability for the six domains.<sup>19</sup> For the present study, the instrument's designer (Dr Maiuro) added two new items to the victim/provider safety domain and one to the frequency of DV inquiry domain, for a total of 42 items. We also added 14 questions to the survey instrument to assess DV knowledge and eight questions assessing provider performance expectancy. All items were presented as questions and scored based on a 5-point Likert-type scale. Sample items from each domain of the survey instrument are shown in Table 1.

We developed a summary score to represent change across each of the eight domains and also examined results for key items individually for descriptive and

qualitative purposes. The survey instrument also included basic demographic information, including age, gender, year of graduation from medical school, primary practice field, previous hours of training in DV, and current practices in managing DV patients.

At the conclusion of the on-line program, we also asked course users to evaluate the quality of the program, using a similar survey instrument as we have used for evaluating other on-line educational programs. Specifically, users were asked to rate (on a 1–5 scale) how well the learning objectives were met, how relevant the program was to their practice, and the overall quality of the program.

### Study Design

Participating physicians who met the eligibility criteria were randomly assigned to either the intervention or control group. Both groups were asked to complete the written survey at the initiation and conclusion of the study. When physicians in the intervention group returned the baseline survey, they were given written information on how to access the on-line program and asked to complete the education program within 2 weeks. Approximately 3 weeks after completing the on-line program, physicians in the intervention group were mailed a second (posttest) survey (approximately 6 weeks after completing the first survey). Physicians in the control group also received the second survey approximately 6 weeks after completing the first survey.

### Analytic Methods

The study endpoints were changes in mean Likert-type scores on the eight domains measured by the survey instrument. We used independent sample *t* tests to compare group means for the changes in domain scores

Table 1

### Sample Items From Domestic Violence Survey Instrument

Domain	Sample Item*
Perceived self efficacy	I feel confident that I can make the appropriate referrals for abused patients.
System support	I have ready access to mental health services should our patients need referrals.
Victim blaming	The victim's passive-dependent personality often leads to abuse.
Fear of offense	It is not my place to interfere with how a couple chooses to resolve conflicts.
Safety concerns	I feel there are ways of asking about battering behavior without placing myself at risk.
Frequency of asking about DV	In the past 3 months, when seeing patients with headaches, how often have you asked about the possibility of domestic violence?
DV knowledge	How much do you feel you now know about how to document DV or suspected DV in the medical chart?
Performance expectancy	The number of times I document DV in the medical chart will . . .

\* See Maiuro et al<sup>19</sup> for additional information and examples.

DV—domestic violence

Items were scored 1 to 5: “strongly disagree” to “strongly agree,” “never” to “always,” “nothing” to “very much,” or “decrease” to “increase a lot,” as appropriate for item. Improvement in two items, “victim blaming” and “fear of offense,” were represented by lower scores. Improvement in all other items were represented by higher scores.

between the intervention and control groups, as well as continuous demographic variables. The Pearson chi-square test was used to test for differences in proportions between the intervention and control groups. To control for possible confounding, we performed hierarchical multivariate regression analyses, with domain change score as the dependent variable, intervention group as the independent variable, and, adjusted for gender, hours of previous DV training, and years since graduation.

## Results

A total of 121 physicians agreed to participate in the study. Twenty-two of these were excluded for not meeting the study criterion of having 1 hour of DV education in the prior year. Sixty-five (66%) of the 99 eligible physicians completed both the pretest and posttest survey. This group was the study population. The progress through the study is shown in Figure 1.

Study subjects were predominantly male (70%) and white, non-Hispanic (81%). Demographic and other baseline characteristics were evenly balanced between the intervention (28 physicians) and control (37 physicians) groups (Table 2).

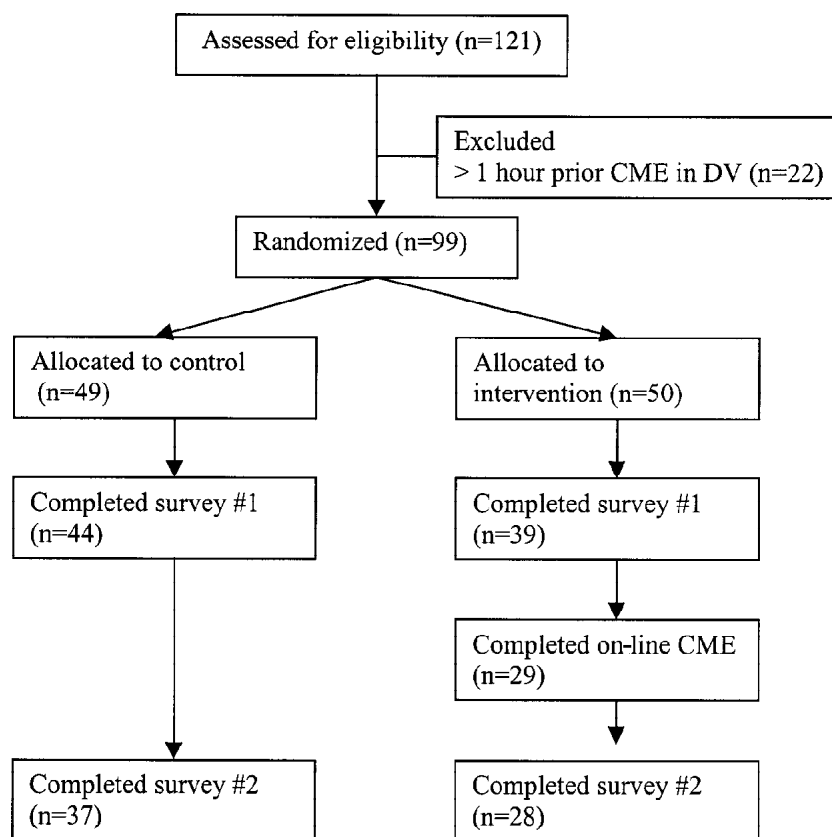
The primary study hypothesis, that use of the on-line DV program would lead to increased self efficacy, was supported by the study findings (Table 3). There was a positive 17.8% mean change in the self-efficacy domain score for the intervention group versus a negative .6% change for the control group ( $P < .001$ ). In addition, we found significant changes in five other domain scores that reflected decreases in victim blaming and fear of offense (note: negative or decreased mean scores in these domains are desirable) and increases in the provider's composite sense of personal safety as well as the safety of the victim, provider knowledge, and provider performance expectancy. Although the scores changed in a positive direction for perceived system support and perceived frequency of asking about DV, the differences between the intervention and control groups did not reach the level of  $P < .05$  for these domains. Multivariate analyses to control for possible confounding of these results by differences in age, gender, or levels of previous DV training in the two groups did not alter the interpretation of the results (data not shown).

A key item of the on-line DV program was an explanation of mandatory abuse reporting laws for health care providers. One question in the DV knowledge domain was "How much do you feel you know about your legal reporting requirements for DV?" Mean changes in scores for this question showed a 39.4% increase for the intervention group versus a 5.1% decrease for the control group ( $P < .005$ ).

Self-reported user satisfaction with the program was high. On a 1–5 scale, where 5 represented "very well," "very relevant," or "excellent," the mean response to our satisfaction questions "How well were the learning objectives of this program met?" was 4.5, "How relevant was the information in this program to your clinical practice?" was 4.1, and "How would you rate this program overall?" was 4.5.

Figure 1

Flow Diagram of Progress Through the Study



**Discussion**

We demonstrated that an on-line DV education program can improve physician confidence (as measured by self efficacy), attitudes, and self-reported knowledge in managing DV patients. This finding should be of considerable interest to academic centers and residency programs wishing to incorporate less resource-intensive, effective DV education programs into their curricula or to organizations seeking to develop systems-based solutions to DV issues. Our results suggest that a relatively brief, easily distributed, interactive, on-line DV education program can be as effective as much more-intensive curriculum-based programs. The provider survey results in this study were similar or greater in magnitude to those reported by Thompson et al,<sup>16</sup> who relied on multiple expert instructors and an intensive, multi-hour classroom approach with role-play exercises.

Based on this study and our earlier work with on-line skin cancer CME, we believe that the elements associated with the program's success were its interactive format, its focus on realistic problem-solving exercises, the presence of user-accessible enablers, and its flexibility. This is consistent with long-standing recommendations for changes in medical education.<sup>20</sup> The use of low-cost computer-based instruction permits the development of individualized, problem-solving educational programs. The presence of the Internet permits their inexpensive distribution. Readers who wish to view this program via the Internet can follow instructions for doing so in the Acknowledgments section.

Our study had several strengths. We used a broad base of Kansas physicians, not physicians in training or members of a single organization, to enhance the generalizability of the results. We used a randomized, controlled trial design with a psychometrically validated, externally derived survey instrument. These elements enhance the reliability and validity of the results. We allowed approximately 3 weeks (mean 25.7 days) between completion of the on-line program and administration of the second survey to the intervention physicians, thus partially addressing the issue of effect delay. Few DV education programs have been formally evaluated in this rigorous fashion.

An important study limitation was that we did not directly evaluate the program's effect on actual physician behaviors or health outcomes. We did note impor-

Table 2  
Characteristics of Intervention and Control Groups

Characteristic	Completed Survey #1		Completed Survey #2*	
	Intervention	Control	Intervention	Control
Sample size	39	44	28	37
Male (%)	69.2	70.4	64.3	73.0
White, non-Hispanic (%)	84.7	80.0	92.9	83.8
Age** in years (SD)	43.2 (9.2)	43.7 (10.9)	42.6 (9.6)	44.2 (11.3)
Years** since graduation (SD)	17.7 (9.4)	17.7 (10.3)	16.7 (9.9)	17.7 (10.5)
Hours** of prior non-CME DV training (SD)	2.5 (4.3)	4.3 (4.7)	3.3 (3.8)	3.6 (3.6)
DV cases seen/year (%):				
None	15.4	13.7	10.7	18.9
1-5	53.8	40.9	50.0	48.6
6	30.8	45.4	39.3	32.4
Primary practice (%)				
Family medicine	28.2	34.0	28.6	32.4
Internal medicine	20.5	18.1	21.4	18.9
Pediatrics	17.9	13.6	21.4	16.2
Other***	33.3	34.3	28.6	32.4

SD—standard deviation  
CME—continuing medical education  
DV—domestic violence

\* Data from subjects who completed both surveys were used to test the study hypotheses. All comparisons between intervention and control groups were  $P > .05$ .

\*\* Mean values shown

\*\*\* Includes emergency medicine, OB-GYN, and a small number of other specialists likely to care for DV patients.

tant changes in physician self efficacy and five other key attitudes and beliefs. Self efficacy, which implies more than “self-confidence,” may be the most critical and influential link between beliefs and behavior.<sup>21</sup> It can predict a variety of health-related behaviors.<sup>22</sup> We are hopeful that these types of changes will improve individual physician's and the health care delivery system's approach to the problems raised by DV.

We do not know if others can duplicate our success with this type of on-line education or whether the positive effects we observed will be durable. These are topics of ongoing research. Lastly, if a program such as this can produce desirable benefits, will every academic center and health delivery system still need to develop its own on-line education programs or will successful models emerge that can be shared by all?

Table 3

## Key Study Findings

Domain	BASELINE MEAN SCORE*		POSTTEST MEAN SCORE*		MEAN SCORE CHANGE		P-Value for Difference**
	Intervention	Control	Intervention	Control	Intervention	Control	
Self efficacy	3.14	3.41	3.70	3.39	.56	-.02	<.001
System support	3.50	3.47	3.77	3.56	.27	.09	.254
Victim blaming	2.25	2.16	1.93	2.10	-.32	-.06	.022
Fear of offending	2.12	1.96	1.83	2.01	-.29	.05	.008
Safety	3.18	3.30	3.52	3.31	.34	.01	.004
Asking about DV	1.69	1.69	1.95	1.78	.26	.07	.082
DV knowledge	2.40	2.50	3.31	2.51	.91	.01	<.001
Performance expectancy	3.76	3.57	3.94	3.53	.18	-.04	.026

DV—domestic violence

\* Scores ranged from 1–5, with 5 indicating maximum amount; see text for discussion.

\*\* P value for independent *t* test comparison between intervention and control groups

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