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Costs Effectiveness of Domestic Violence Screening in Primary Care Settings: A Comparison of 3 Methods

Ping-Hsin Chen[1]*, Sue Rovi[1], Ko-Yu Pan[1] and Mark S Johnson[2]

[1]*Assistant Professor, Department of Family Medicine, Rutgers University-New Jersey Medical School, USA*
[2]*Dean, Howard University College of Medicine, USA*

Abstract

Purpose: To compare the cost effectiveness of brief domestic violence (DV) screening tools used in three screening protocols: self-administered, medical staff interview, and physician interview.

Methods: We conducted secondary analyses of data collected at 4 urban primary care settings during July 2004 through June 2005. The primary study was a randomized trial of 523 female patients who were assigned to 1 of the 3 screening protocols. Inclusion criteria were women aged 18 or older and currently involved with a partner. Each screening protocol included two brief DV screening tools, HITS and WAST-Short. Patients completed a post-screening survey to assess time spent screening. Data on provider salaries and training costs were also collected. Outcome measures were the costs to have one DV disclosure for each screening protocol. Sensitivity analyses were conducted to assess the robustness of the cost analysis.

Results: With an overall disclosure rate of 14%, no difference was found among the three protocols. Costs for one DV disclosure by screening protocol were $9.98 for the self-administered, $15.46 for the medical staff interview, and $62.03 for the physician interview. For each protocol, increases in disclosure rates, proportion of patients screened, or screening frequency might reduce the average costs of screening.

Conclusions: Patient self-administered disclosure of DV is less costly compared with provider interview. In terms of costs, this study supports routine or universal DV screening in primary care settings.

Keywords: Domestic violence; Intimate partner violence; Screening; Cost-effectiveness

Introduction

It is estimated that 5.3 million (DV) victimizations occur each year and that the lifetime prevalence of DV victimization is 25% for women in the general population [1]. Domestic violence leads to nearly 2 million injuries, and more than 550,000 of these injuries result in some medical treatment of victims [2]. The Centers for Disease Control and Prevention estimate that the direct annual costs of medical care including mental health care for victims of DV is $4.1 billion [3].

Primary care settings have become recognized as an ideal site for early detection of domestic violence [4]. Most women regularly see primary care providers for routine exams, preventive care, and health problems. Patients, providers, and medical organizations have recognized that clinical settings can be a safe place to discuss DV [5-10]. The recognition of DV by providers can have a powerful effect on patient perception of the situation and may help the patient in the process of ending the abuse. Routine screening has been debated for decades. However, recently, the US Preventive Services Task Force recommends that clinicians screen women of childbearing age for intimate partner violence, such as domestic violence, and provide or refer women who screen positive to intervention services [11].

The purpose of this study was to compare the cost effectiveness of brief DV screening tools used in three screening protocols: self-administered, medical staff interview, and physician interview. To our knowledge, there have been no randomized trials that examine the cost effectiveness of DV screening in primary care settings.

Methods

Participants

This study is a secondary analysis of data collected at 4 urban primary care settings. Detailed methods of the original study have been published previously [12]. From July 1, 2004 through June 30, 2005, 523 female patients, aged 18 or older and involved with a partner, were recruited and screened for DV in a current relationship. DV trained research assistants obtained informed consent and conducted the screenings in a private room. Patients were screened for DV using 2 brief screening tools: HITS and WAST-Short. HITS is one of the shortest screening tools, and it forms an easily remembered acronym. HITS has accurately classified 91% of non-victims and 96% of female victims [13]. HITS has demonstrated good reliability and concurrent validity with the Conflict Tactics Scale (CTS), an established gold standard for measuring partner violence. Cronbach's alpha was 0.80 for HITS and a correlation of 0.85 between HITS and CTS. HITS was also tested with diverse populations, and tested and used in family medicine practices [13]. WAST-Short consists of 2 of the 8-item WAST (Woman Abuse Screening Tool). In a previous study, WAST-Short correctly classified 92% of victims and 100% of non-victims [14]. The research assistants reviewed the screening results and made appropriate referrals as needed. All patients were provided with DV materials for DV prevention. After the screening process, the research assistants distributed a self-administered survey to the patients to collect information on time spent

***Corresponding author:** Ping-Hsin Chen, Assistant Professor, Department of Family Medicine, Rutgers University-New Jersey Medical School, Newark, NJ. 183 S. Orange Avenue, Newark, NJ 07103, USA, Tel: (973) 972-7979; E-mail: chenpi@njms.rutgers.edu

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screening and socio demographic background. Institutional Review Board approval for the previous and the current study were obtained.

Screening costs calculations

For comparability with previous studies, all costs were estimated on an annual basis [15]. Although the 3 screening protocols were simultaneously used in the practices, we assumed that only 1 screening protocol would be used over a year. The costs of screening included training and implementation costs. We assumed that the effect of DV training would last for 1 year and that training costs would be the same for the 3 screening protocols. Training costs included personnel and materials costs, and lunch. Personnel costs were calculated by multiplying trainee's and trainer's salaries with their time spent training. Implementation costs included personnel time spent screening and record keeping. Costs of facilities were not included because no additional facilities or time was used [16]. Total number of women screened over a year was estimated by multiplying the monthly total number of eligible patients in the study by 12. Annual implementation costs were calculated by multiplying total implementation hours by the hourly wage of providers or research assistants. Provider's salaries were estimated from the Consumer Price Indexes of Medical Care Prices [17-19].

We hypothesized $10 differences in cost per DV disclosure ($10, $20, $30, respectively; SD=5) among the 3 protocols. Screening for DV with 174 or 175 women from each method for a total of 523 provides more than 80% power to detect such differences at alpha=0.05 (2-tailed test).

Analysis

Analysis was done using SPSS and EXCEL. The outcome measure is the cost to have one DV disclosure for each screening protocol. Women who screened positive on HITS or WAST-Short in the 3 protocols met the criteria for DV exposure. Costs per DV disclosure was defined as the costs of screening divided by the total number of DV disclosures by each of the 3 screening protocols. Costs were expressed in 2004 U.S. dollars, which were not discounted because they were only over 1 year [16].

For cost analysis, we developed base case costs assuming universal annual population screening. We used the mean values of selected parameters from the current study or the estimated values from public sources [17-19]. These parameters included training costs, number of visits per year, time spent screening, screening rate, frequency of screening, detection rate of the current study, and personnel salaries. We then conducted sensitivity analyses to explore the robustness of the results in different scenarios. We altered the values of the number of women screened, time spent screening, and detection rate using 95% confidence intervals. We compared the base case 100% screening rate with rates of 25% and 50%. For screening frequency, we compared the base case of once a year with twice a year and once every two years. A 20% variation in personnel salaries was assumed.

Results

Costs of screening

Table 1 summarizes base case values and ranges for sensitivity analysis by screening protocol. We developed base case values assuming universal screening once a year for each screening method. When using both tools, self-administered showed lower training costs compared with medical staff interview and physician interview ($771.90, $1,742.05 and $7,690.72, respectively). A total of 3,121 patients were screened and the time spent screening per patient was 4.8 minutes. The hourly wage for a research assistant was $15. The detection rate was 14.5%. Time spent screening was similar among the 3 methods. Provider salaries for self-administered were less compared with those for provider interview ($15 vs. $19.90 and $102). Detection rates were similar among the 3 protocols as shown in Table 1 (p=0.862 for both tools, p=0.959 for HITS, and p=0.914 for WAST-Short, respectively) [12]. Results from separate analysis of HITS and WAST-Short indicated that time spent screening and detection rate were the only differences in calculating base case costs. For example, for the self-administered protocol, time spent screening was less using WAST-Short (1.6 minutes) than using HITS (3.2 minutes). And, the detection rate was higher using WAST-Short (13.3%) than HITS (6.4%). These findings provide support for only using the WAST-Short as a screening measure. Similar results were found in medical staff interview and physician interview.

After taking into account different scenarios, we produced the values of upper and lower bound costs for the above parameters. For example, when using both tools and allowing for a 20% difference in provider salary, the resulting training costs ranged from $708.90 to $834.90, and provider salaries ranged from $12 to $18. Similarly, using 95% confidence intervals, the number of patients screened per year ranged from 2,496 to 3,745; time spent screening ranged from 4.3-5.4; detection rate ranged from 9.2 to 19.7%. To take into account time constraints experienced in busy clinical practice settings, we created

Variables	Self-administered			Medical staff interview			Physician interview		
	Both tools	HITS	WAST-Short	Both tools	HITS	WAST-Short	Both tools	HITS	WAST-Short
Training costs	$771.90 ($708.90-$834.90) No differences by tool			$1,742.05 ($1,529.11-$1,954.99) No differences by tool			$7,690.72 ($6,311.56-$9,069.34) No differences by tool		
Number of patients per year [1]	3,121 (2,496 - 3,745) No difference by tool or method								
Time spent screening per patient (in minutes) [1]	4.8 (4.3-5.4)	3.2 (2.9-3.6)	1.6 (1.4-1.8)	4.4 (3.9-4.9)	2.9 (2.6-3.3)	1.5 (1.3-1.6)	4.0 (3.6-4.5)	2.7 (2.4-3.0)	1.3 (1.2-1.5)
Provider salary (hourly wage) [2]	$15.00 ($12.00-$18.00) No difference by tool			$19.90 ($15.70-$23.60) No difference by tool			$102.30 ($81.45-$122.70) No difference by tool		
Detection rate [1]	14.5% (9.2%-19.7%)	6.4% (2.7%-10.0%)	13.3% (8.2%-18.4%)	13.0% (7.9%-8.1%)	5.9% (2.3%-9.5%)	11.8% (6.9%-16.8%)	15.0% (9.7%-20.3%)	6.7% (3.0%-10.3%)	12.2 % (7.4%-17.1%)

1. 95% Confidence Intervals are in parentheses.
2. Source: U.S. Department of Labor, Bureau of Labor Statistics Occupational Outlook Handbook: Physicians and surgeons. http://www.bls.gov/oco/ocos074.htm, 27 June 2006.

Table 1: Base case values and ranges for sensitivity analysis by screening protocol.

Variable	Self report			Medical staff interview			Physician interview		
	Both tools	HITS	WAST-Short	Both tools	HITS	WAST-Short	Both tools	HITS	WAST-Short
Base case cost per DV case identified	**$9.98**	**$16.36**	**$4.87**	**$15.46**	**$25.68**	**$8.10**	**$62.03**	**$105.69**	**$38.42**
Changed assumptions:									
Training costs									
20% reduction in training costs	$9.84	$16.05	$4.72	$14.94	$24.52	$7.58	$58.40	$97.58	$33.97
20% increase in training costs	$10.12	$16.68	$5.02	$15.99	$26.84	$8.63	$64.30	$110.77	$41.21
Number of patients per year									
Lower bound	$10.41	$17.33	$5.33	$16.54	$28.05	$9.18	$66.14	$114.90	$43.48
Upper bound	$9.70	$15.72	$4.56	$14.75	$24.10	$7.39	$59.29	$99.56	$35.05
Time spent screening									
Lower bound	$9.12	$15.19	$4.49	$14.19	$24.00	$7.59	$57.47	$98.03	$37.02
Upper bound	$11.02	$17.93	$5.24	$16.73	$27.92	$8.36	$67.73	$113.35	$41.22
Screening rate									
25%	$15.10	$27.96	$10.45	$28.34	$54.06	$20.98	$111.31	$216.03	$99.01
100%	$11.69	$20.23	$6.73	$19.76	$35.14	$12.39	$78.46	$142.47	$58.62
Frequency of screening									
Once every two years	$11.69	$20.23	$6.73	$19.76	$35.14	$12.39	$78.46	$142.47	$58.62
Twice a year	$9.13	$14.43	$3.94	$13.32	$20.95	$5.95	$53.81	$87.30	$28.32
Provider salary									
Lower bound	$8.33	$13.86	$4.27	$13.09	$22.24	$7.29	$52.69	$91.58	$34.69
Upper bound	$11.64	$18.86	$5.47	$17.49	$28.63	$8.79	$71.09	$119.39	$42.04
Detection rate									
Lower bound	$15.73	$38.79	$7.89	$25.45	$65.88	$13.33	$95.92	$236.04	$63.34
Upper bound	$7.35	$10.47	$3.52	$11.11	$15.95	$5.82	$45.83	$68.75	$27.41

Table 2: Costs of DV screening by protocol.

various scenarios for screening rate and frequency of screening. For screening rate, we compared the base case 100% screening rate with screening rates of 25% and 50%. Frequency of screening ranged from once every two years to twice a year.

Table 2 presents the costs of DV screening among the three protocols. Results from base case analysis indicated that self-administration is the least expensive screening approach, regardless of type of instrument. To have one DV disclosure using both instruments in a primary care setting, the costs were $9.98 for self-administration, $15.46 for medical staff interview, and $62.03 for physician interview. Average costs of screening using WAST-Short were less expensive than those using HITS or both instruments. Results from the base case analysis were robust for considering variations in the confounders. Ranking of costs was similar among the 3 screening protocols. When other factors remained constant, universal population screening (100% screening rate) is least costly compared to screening fewer patients (50% or 25% rates). Similarly, increases in disclosure rates or screening frequency would reduce the costs of screening.

Discussion

To our knowledge, this is the first study to compare the average costs of DV screening protocols in primary care settings. We found that self-administered DV screening is less expensive compared to provider interview, regardless of type of instrument. In addition, within self-administered DV screening, the WAST-Short is the most cost effective tool. Physician interview is the most costly approach, regardless of type of instrument with the average cost of one DV disclosure using HITS and WAST-Short 6 times greater than self-administered screening. Many studies have found that lack of time is a provider barrier to screening, [20-23] and self-administered screening can overcome this barrier [13]. Those primary care settings with higher disclosure rates of DV may further reduce the cost of screening. When other factors remained constant, routine or universal screening is less expensive. DV screening is less costly compared to screening for other diseases in primary care settings regardless of screening approach. For example, the average cost to identify one case of depression is $31 to $166, and to assess one infected HIV individual is $3,000 to $4,200 [24,25] Plus, the prevalence and primary care costs of DV are comparable to those of HIV or depression [24,25].

This study has some limitations. This study did not take into account the costs associated with responding to women who screen positive. In practice, clinicians should consider not only the costs of the actual process of screening, but also those associated with services provided to women who screen positive. However, the benefits of DV screening may be under-estimated. Providers' screening skills may improve over time, which in turn may lead to increases in detection rates and decreases in costs. We did not investigate the long-term effects of screening. Given that repeated inquiries will likely increase the disclosure of DV, [26] the cost of screening may be even less than reported here. Few studies have examined the long term benefits or harm of DV screening in primary care [11]. Future studies are needed to estimate the cost to confirm DV cases and the cost-effectiveness of screening and intervention. Our study screened only women patients because women are 7 to 14 times more likely than men to suffer injuries [11]. Finally, this study was conducted in urban primary care clinical settings predominantly with minorities, and may not be generalizable to other clinical settings or populations.

In conclusion, in terms of costs, this study supports routine or universal DV screening in primary care settings.

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