

Utility of STaT for the Identification of Recent Intimate Partner Violence

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Intimate partner violence (IPV) is an important issue with far-reaching health consequences. This study investigates the utility of STaT, a three-question IPV screening tool, for recent IPV identification in a sample of adult women in an inner-city urgent care clinic. STaT score was calculated as the total number of affirmative responses to the three questions. Efficacy of STaT as an IPV screen was estimated by computing the sensitivity and specificity at possible cut points, based on participant's STaT score, and using Index of Spouse Abuse scores as a comparison standard. The sensitivities of STaT were 94.9%, 84.8% and 62% with the cut points set at scores of 1, 2 and 3, respectively. Thus, with the criterion for a positive screen set at a cut-point score of 1, STaT can be used to facilitate the identification of abused women in busy public healthcare settings.

Key words: violence ■ screening ■ women's health

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BACKGROUND

Intimate partner violence (IPV) is a constellation of intentional violent or controlling behaviors, which occur within the context of an intimate relationship. Four separate aspects of IPV—as defined in a Centers

for Disease Control and Prevention report on IPV definitions—are physical violence; sexual violence; threat of physical or sexual violence; and psychological or emotional abuse, including coercive tactics.¹ Patients who are victims of violence may have experienced these four forms of IPV together or separately in ≥ 1 relationship over their lifetime. The lifetime prevalence of IPV ranges from 26–54% among patients in different medical settings,^{2–9} while the one-year incidence of IPV ranges from 10–15%.^{5,6,9} In one emergency room study, 13% of all women seeking care did so for injuries and illnesses related to IPV.² Patients who report IPV have been shown to suffer from a variety of pain syndromes, including headaches¹⁰ and chronic abdominopelvic complaints,^{11,12} and report higher rates of posttraumatic stress disorder, depression,^{13,14} substance abuse^{15–17} and suicidality.¹³ They also report overall poorer health status,^{18–20} and utilize and cost healthcare systems more.^{21–25} Thus, not only is IPV very common in women, but it also is associated with significant morbidity.

Due to the high prevalence of IPV in women seen in healthcare settings, healthcare visits are an excellent window of opportunity to screen patients for IPV. Universal IPV screening by physicians has been recommended since 1992 by the American Medical Association^{26,27} and other professional societies.^{28,29} While systematic reviews of the literature on IPV have yet to yield evidence for the efficacy of IPV screening,^{30,31} several factors still support empiric inquiry about IPV in female patients by healthcare providers, including the substantial prevalence of IPV, its repetitive nature, and its high medical and societal costs.^{32,33} Current detection rates for IPV have improved overall, yet providers still do not screen their patients routinely.^{34–38} Researchers have identified several barriers to screening, including perceived lack of time; lack of resources; reluctance on the part of physicians to screen due to personal beliefs that caring for IPV victims is difficult, low-paying and stressful; or due to a personal history of trauma.^{38–41} A challenge to identification of IPV is the paucity of clinically useful screening tools. A clinically useful screening tool for IPV would safely and reliably identify the majority of those patients affected by IPV.⁴² To do so,

such a screening tool should have a high sensitivity; in the context of IPV in healthcare settings, the specificity of the screening tool may be less important than its sensitivity. Sensitivity rates are available for only a few published screening questions or tools for IPV detection, and not all tools have sensitivity rates high enough to maximize IPV detection. Furthermore, not all existing screening tools for IPV are sufficiently validated, nor are these tools able to detect most forms of IPV. Some are too cumbersome to use in practice.⁴³⁻⁴⁸

In a prior study, to address this gap in research, we developed a three-question screening tool—STaT [slapped, threatened and throw (things)]—that is short and sensitive for the identification of lifetime IPV. Sensitivity of STaT was estimated to be 96% for the detection of lifetime IPV using an affirmative response to any one of the three questions as the cut-off for a positive screen.⁴⁹ Identification of patients who are currently being abused or have been abused in their most recent relationship is of value, as such patients are potentially at greater risk for harm or ill effects from the abuse.^{50,51} This paper reports the results of a study that examines the utility of STaT for recent IPV.

METHODS

Participants

We recruited a sample of 240 women for this study from patients seeking medical services at the urgent care center of a large inner-city public hospital in the south-eastern United States. The urgent care center serves as a safety net providing primary care to a largely indigent and uninsured population, and also delivers acute medical care. Approximately 50,000 patient visits are made to the urgent care center per year. To be eligible for the study, women had to be 18–65 years of age, English speaking and had to have seen a medical provider in the urgent care center on that day. Patients who could not be interviewed alone were excluded.

Data Collection

Trained research interviewers systematically approached all women in the discharge area of the urgent care center to ask them about their interest in participating in a study on women's health and screened interested women for eligibility (Figure 1). Research interviewers used a private room to obtain informed consent and to conduct the study interview. Each partic-

Table 1. Participant characteristics (n=240)

| Demographic Characteristics | IPV (+) N (%) | IPV (-) N (%) | p Value |
|---|---------------|---------------|---------|
| Age (Years), Mean (Standard Error) | 37.2 (0.8) | 39.7 (1.1) | 0.08 |
| Currently in Relationship | 37 (46.8) | 116 (72) | 0.0001 |
| Children Living with Patient | 30 (38) | 72 (44.7) | 0.058 |
| Housing Status | | | |
| Rent or own | 52 (65.8) | 113 (70.2) | 0.148 |
| Live with relatives or in shelter | 26 (32.9) | 44 (27.3) | |
| Other | 1 (1.3) | 4 (2.5) | |
| Marital Status | | | 0.34 |
| Ever married | 38 (48.1) | 67 (41.61) | |
| Never married | 41 (51.9) | 94 (58.39) | |
| Education | | | 0.53** |
| Eighth grade or less | 2 (2.5) | 5 (3.1) | |
| Some high school | 22 (27.8) | 32 (19.9) | |
| High-school grad or more | 44 (55.7) | 95 (59) | |
| Other (include technical school) | 11 (13.9) | 29 (18) | |
| Work Status | | | 0.27 |
| Full- or part-time | 31 (39.2) | 80 (49.7) | |
| Disabled | 12 (15.2) | 19 (11.8) | |
| Unemployed | 29 (36.7) | 43 (26.7) | |
| Other | 7 (8.9) | 19 (11.8) | |
| Insurance Status | | | 0.62** |
| None | 52 (65.8) | 106 (65.8) | |
| Medicare or Medicaid | 17 (21.5) | 33 (20.5) | |
| Private | 8 (10.1) | 12 (7.4) | |
| Other | 2 (2.5) | 10 (6.2) | |
| Number of Children Median (Range) | 2 (0–9) | 2 (0–9) | 0.17 |
| Current Relationship Length in Years, Median (Range)*** | 2 | 4 | 0.26 |
| Monthly Income, Median (Range) | \$800 | \$800 | 0.21 |
| | \$0–\$3,200 | \$0–\$6,000 | |

** Fisher's exact; ***Of those in a current relationship, n=153; IPV: intimate partner violence

ipant was interviewed by one-half trained interviewers, using a questionnaire developed and piloted prior to data collection. The study questionnaire included demographic questions, the screening questions to be tested (including STaT) and the scale used as the comparison standard. All participants were offered \$10 as compensation for their time.

Predictor Variables

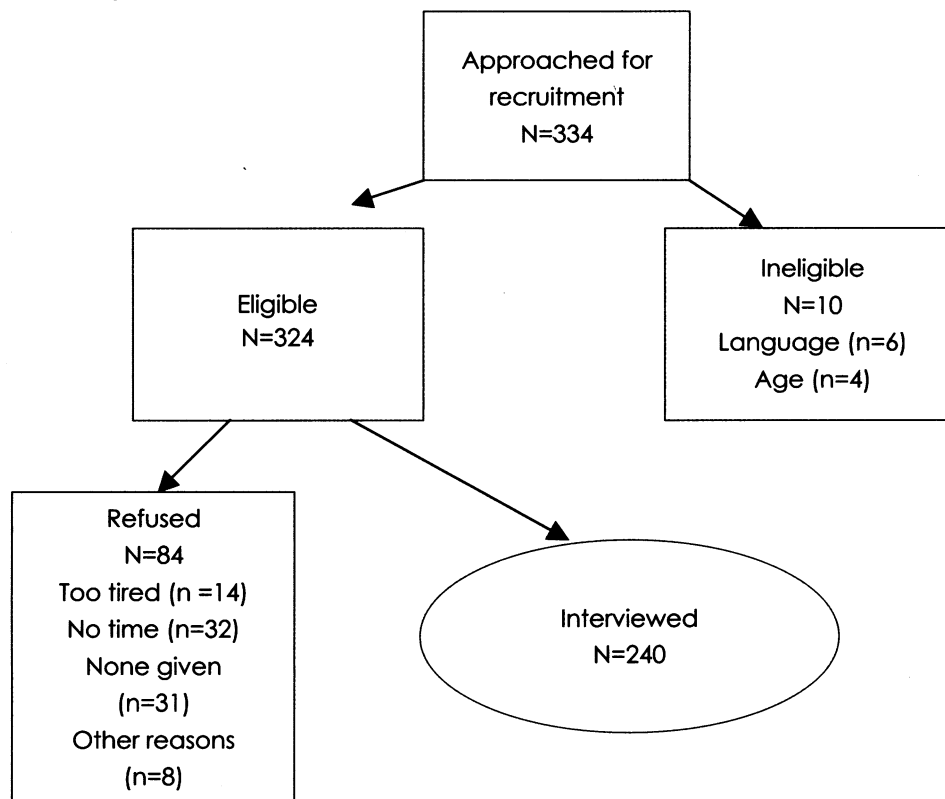
Predictor variables tested were the screening tool STaT and four other individual screening questions. The three questions that comprised STaT were: "Have you ever been in a relationship where: a) your partner has pushed or slapped you; b) your partner threatened you with violence; c) your partner has thrown, broken or punched things?" (Figure 2). Participants responded to each question with either "yes" or "no." To calculate the STaT score for each participant, we summed the total number of affirmative responses to each of the three STaT questions, using established methods for scoring clinical screening tools.^{52,53} Participants who responded to all three questions with "no" were assigned a score of 0; those who responded to any one question with "yes" got a score of 1. A score of 2 meant that the participant responded to any two of three STaT screening questions affirmatively, and a score of 3 was assigned to participants who answered "yes" to all three STaT questions. Based on these scores, there were three

possible scores that could be selected as a cut-off level (cut point) for a positive STaT screen for IPV. At a cut point of 1, participants who had a STaT score of ≥ 1 would be IPV screen positive. Similarly, with the cut point set at a STaT score of 2, participants with scores of ≥ 2 —that is, those participants who answered two of three or all three STaT questions with "yes" would be considered to be IPV screen positive. Finally, at a cut point of 3, only those participants with a score of 3 would be IPV screen positive on STaT. The four additional single-item screening questions, also answered with either "yes" or "no," were questions that were found to have an estimated sensitivity of $\geq 70\%$ in prior work.⁴⁹ These were: "Have you ever been in a relationship where: a) your partner did not treat you well; b) you have felt controlled by your partner; c) you have felt lonely; d) your husband, lover, boyfriend has hit, kicked, threatened or otherwise hurt or frightened you?"

Outcome Variable

The scale used as the comparison standard to assess for IPV in the respondent's recent relationship was the Index of Spouse Abuse (ISA).⁵⁴ The ISA is a 30-item, five-point Likert scale, research instrument comprised of items on physical, emotional and sexual abuse that has two subscales—ISA physical (ISA-P) and ISA non-physical (ISA-NP). This scale has been validated for use in similar study populations⁵⁵ and has good internal con-

Figure 1. Recruitment process



sistency for both the physical ($\alpha=0.88$) and nonphysical ISA subscales ($\alpha=0.88$) at this study site.¹³ Using the validated procedures described by Hudson and McIntosh, we weighted participant responses for each scale item. The weight given to an individual item was a function of the severity of the abusive act. More severe forms of abuse (threats made with a weapon, physical abuse requiring medical care) carried a higher weight, while less severe forms of abuse (belittling, jealousy and suspicion) carried a lower weight. Next, we summed the scores for each subscale, and applied their criteria to define IPV (physical and nonphysical).⁵⁴ Therefore, we classified participants who scored >10 on the ISA-P or >25 of the ISA-NP as IPV positive. Participants who scored below *both* cut points were classified as IPV negative. Since the ISA does not have a time frame embedded within the scale, participants were asked to respond to ISA questions based on their most recent relationship, which could be either their current or the most recent past relationship. In addition, demographic items were measured for this study and included age, race, current relationship status, housing status, marital status, educational attainment, employment, insurance status and estimated monthly income.

Participant Safety Measures

Due to the sensitive nature of the questions and the potential for escalation of violence, the research team had several safety measures in place. The participant was interviewed alone in a private room. All participants were asked about personal safety prior to completion of the interview and were referred to an on-site social worker if needed. The study protocol was approved by the institutional review board and the hospital's research oversight committee prior to the interviews.

Statistical Analysis

We calculated means with standard deviations and frequencies for continuous variables and categorical variables, respectively. Sensitivity of STaT for each cut point was computed as the proportion of IPV-positive participants who were also IPV screen positive at that cut point. Corresponding specificity was computed for each cut point as that proportion of IPV-negative participants who were IPV screen negative as determined by responses to STaT at that cut point. We also calculated the sensitivity and specificity for each of seven questions tested, using two-by-two tables, and calculated 95% confidence intervals (CIs) for all estimates of sensitivity and specificity. A p value of 0.05 was used for all tests of significance. Our sample size was based on an expected IPV prevalence of 30%, alpha of 0.05, and an expected sensitivity of $\geq 95\%$ for a positive screen with a confidence interval width of 5%.^{56,57}

RESULTS

Of the 240 women interviewed, 79 (32.9%) reported IPV in their most recent relationship, as defined by the ISA. Of the 240 women, 153 (63.7%) were in a relationship at the time of the interview. The prevalence of current IPV in this population was 15.4%. The mean age was 38 years (SD: 10 years); 219 (91.3%) were African-American. The median monthly income was \$800, 8.3% had private health insurance and 46.3% were employed (Table 1). There was no significant difference between IPV-positive and IPV-negative participants, except IPV-positive participants were less likely to be in a current relationship than IPV-negative participants; of the 79 women who were IPV positive, 42 had left the relationship (53.1%). The median length of time since the last relationship for those not in a relationship at the time of the interview was one year. This duration did not differ

Table 2. Test characteristics of individual screening questions

| Screening Question | Sensitivity % (CI) | Specificity % (CI) |
|--|--------------------|--------------------|
| Have you ever been in a relationship where your partner has pushed or slapped you? | 88.6% (81.6–95.6%) | 47.8% (40.1–55.5%) |
| Have you ever been in a relationship where your partner threatened you with violence? | 83.5% (75.4–91.7%) | 52.2% (44.4–59.9%) |
| Have you ever been in a relationship where your partner has thrown, broken or punched things? | 69.6% (59.5–79.8%) | 56.5% (48.9–64.2%) |
| Have you ever been in a relationship where your partner did not treat you well? | 96.2% (92–100%) | 31% (23.9–38.2%) |
| Have you ever been in a relationship where you have felt controlled by your partner? | 84.8% (76.9–92.7%) | 44.1% (36.4–51.8%) |
| Have you ever been in a relationship where you have felt lonely? | 88.6% (81.6–95.6%) | 32.3% (25.1–39.5%) |
| Have you ever been in a relationship where your husband, lover, boyfriend has hit, kicked, threatened or otherwise hurt or frightened you? | 81% (72.3–89.7%) | 50.3% (42.6–58%) |

STaT comprises the first three questions (slapped, threatened, and throw things); CI: confidence intervals

by IPV status. The sensitivity and specificity of the seven individual questions are presented in Table 2. Individual question sensitivity ranged from 69.2–96.2% (Table 2). The sensitivity of the individual questions is better than its specificity.

The sensitivities (95% CIs) of STaT as a screening tool for IPV were 94.9% (90.1%, 99.8%), 84.8% (76.9%, 92.7%) and 62% (51.3%, 72.7%) for STaT scores of ≥ 1 , ≥ 2 and 3, respectively, when compared to IPV status. The corresponding specificities were 36.6% (29.2%, 44.1%), 54% (46.3%, 61.7%) and 65.8% (58.5%, 73.2%) (Table 3). A STaT cut-off score of 1 had the highest sensitivity for recent IPV, which corresponded to a negative predictive value (NPV) of 93.6%. NPVs for STaT score cut points of 2 and 3 were 87.9% and 77.9%, respectively. Corresponding positive predictive values (PPV) were 42.3%, 47.5% and 47%.

DISCUSSION

In this clinical study, we have shown that a lifetime IPV screening tool, STaT, can also be used to aid the identification of women who have been abused in their current or most recent relationship. STaT had been developed in by testing a pool of 43 questions against lifetime IPV, verified by structured interview and by identifying the best combination of questions that maximized sensitivity and specificity. The result of that study was a three-question screen for lifetime IPV, STaT.⁵³ In this study, we have tested the efficacy of STaT for the identification of recent IPV using a validated research instrument^{54,55} and have found that STaT is a sensitive screening tool for the identification of recent IPV while retaining moderate specificity. While significantly more women reporting recent abuse were not in a relationship at the time of the interview, this difference in relationship status between the IPV-positive and IPV-negative groups was expected, as it is more likely that the IPV-positive participants had left the relationship due to the abuse.

As a screening tool for IPV, STaT has a few advantages over other published tools for IPV screening—which include the Partner Violence Screen (PVS), the Woman Abuse Screening Tool (WAST) and HITS—in that it is brief, has been validated, and can detect both lifetime and recent IPV. The PVS is a three-item screening tool designed to detect current physical and non-physical violence. The sensitivity of the PVS was found to be 64.5% and 71.4% when compared to the ISA and the Conflict Tactics Scale (CTS), respectively.⁴⁶ Further testing in a separate study of predominantly Hispanic and African-American, urban women found the sensitivity to be only 33.4%.⁵⁸ HITS is a screen for current physical or emotional abuse, consisting of four written questions, each with a five-point Likert response scale that correlated well ($r=0.85$) with the CTS.⁴⁸ A HITS score of ≥ 10.5 detected 96% of self-identified violence victims. The scoring of HITS requires additional time, which may make it less practical for use in a busy prac-

tice. Finally, WAST is a seven-item screen for current physical and emotional abuse that is shown to correlate well ($r=0.96$) with the Abuse Risk Inventory in a large patient sample.⁴³ The sensitivity of a shorter version of the WAST for current abuse in a small sample was 96%,⁴⁴ but sensitivity of the longer tool is not known. While the advent of touch-screen, computerized kiosks should eliminate screening tool length as a barrier to its use, currently, STaT holds the advantage of being brief, and as or more sensitive than existing tools, and useful for both recent and lifetime IPV. The sensitivity of STaT at a cut point of 1 is comparable to another commonly accepted screening test in women: screening mammography has an estimated sensitivity range 83–95% in women age >50 .⁵⁹

Another advantage of STaT is that it has been validated in two separate clinical settings: an urban emergency room and an urgent care center providing routine healthcare for the indigent and uninsured. A third advantage of STaT is its simplicity. It consists of three questions with a simple scoring system. Although this study was not designed to test this hypothesis, we expect that this feature should make STaT easy to use either in an oral or a written format on a clinic intake form. While we found that our individual screening questions also had high sensitivity for recent IPV, we have shown that STaT is a more effective screen than any single question used alone and has the added benefit of a proven efficacy in two study samples.

While we found STaT to be very sensitive for identification of recent IPV, the specificity and PPV were modest. An effective screening tool should have a high sensitivity.⁶⁰ STaT is similar to the CAGE for alcohol abuse,⁵² in that the sensitivity of the tool is highest when the criterion for a positive screen is an affirmative response to *any* one question. As we have demonstrated in this study, as the cut point for a positive STaT screen increases from 1 to 3, the specificity of the tool improves at the expense of the sensitivity.⁴² Therefore, to maximize sensitivity, clinicians may choose to use a STaT score of ≥ 1 to trigger further inquiry because the sensitivity at this cut point for a positive screen is 95%, which minimizes the likelihood that abuse will be missed by this screen. As the NPV for STaT was high—at

Figure 2. STaT: slapped, threatened and throw (things)

Have you ever been in a relationship where your partner has pushed or slapped you?

Have you ever been in a relationship where your partner threatened you with violence?

Have you ever been in a relationship where your partner has thrown, broken or punched things?

Table 3. Test characteristics of the STaT screening tool

| Number of Affirmative Responses | Sensitivity % (95% CI) | Specificity % (95% CI) | Negative Predictive Value |
|---------------------------------|---------------------------|---------------------------|------------------------------|
| ≥1 | 94.9 (90.1–99.8) | 36.6 (29.2–44.1) | 93.6% |
| ≥2 | 84.8 (76.9–92.7) | 54 (46.3–61.7) | 87.9% |
| All 3 | 62 (51.3–72.7) | 65.8 (58.5–73.2) | 77.9% |

STaT: stands for slapped, threatened and throws (things); CI: confidence interval

93.6%—a negative response to all three STaT questions should reassure the clinician that the patient has not experienced prior IPV and therefore does not need further inquiry. For patients who screen positive with STaT, follow-up should involve further inquiry to assess for ongoing abuse or issues related to abuse in the recent past. Unlike testing for asymptomatic disease, where a positive screen can result in a procedure that can be invasive, the next step in the follow-up to a positive STaT screen is a detailed history to evaluate for IPV, tailored to the patient's individual needs. Screening questions are one of many tools that can be used as part of a multifaceted response to IPV. In multiple studies, patients have endorsed inquiry about IPV during a physician visit.^{36,61} Asking about IPV can enhance a physician's understanding of the patient's symptoms, can potentially avoid expensive work-ups, and, most importantly, can facilitate referral to appropriate services. On the other hand, screening can incur costs, including use of physician time needed for follow-up to abuse and healthcare costs incurred when the patient is referred to services. The risks and benefits are yet to be confirmed by rigorously designed clinical studies, and most experts still advocate IPV screening and inquiry.^{32,62}

Another limitation is the generalizability of the screening properties to other populations. STaT has been developed and tested at urban, clinical sites with economically disadvantaged, largely African-American participants, and the screening properties can only be generalized to similar patient populations. Future research, using appropriate comparison standards will be needed to confirm its utility in other populations. As the NPV reported for STaT will vary based on IPV prevalence, it should be interpreted with caution. Finally, STaT does not address sexual violence specifically, and its ability to screen patients for sexual violence is unknown. While it is possible that it is effective for the detection of sexual violence in an intimate relationship, it may not be an effective screening tool for sexual assault by an acquaintance or stranger.

In conclusion, we have confirmed that a short, sensitive screening tool for lifetime IPV can be useful as an initial screen for recent IPV. Having a sensitive screen for recent IPV may facilitate clinician efforts to identify those patients experiencing IPV who might be at immediate risk of harm from the abuse and may potentially help to initiate a dialogue between patients and their

providers about IPV. Given the ongoing debate over screening for IPV,^{30,62,63} further studies are needed to examine whether or not using a screening tool such as STaT to identify a history of IPV among patients seeking care in high-volume practice settings (such as emergency rooms or indigent care clinics) will indeed lead to better outcomes and reduced healthcare costs.

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