Behaviour Research and Therapy 97 (2017) 222–229

Contents lists available at ScienceDirect

Behaviour Research and Therapy

journal homepage: www.elsevier.com/locate/brat

Optimizing trauma-informed intervention for intimate partner violence in veterans: The role of alexithymia

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ARTICLE INFO

Article history:
Received 10 March 2017
Received in revised form
11 August 2017
Accepted 11 August 2017
Available online 14 August 2017

Keywords:
Veteran
Trauma
Alexithymia
Randomized control trial
Intimate partner violence

ABSTRACT

Recent research supports the efficacy of *Strength at Home-Men's Program* (*SAH-M*), a trauma-informed group intervention designed to reduce use of intimate partner violence (IPV) in veterans (Taft, Macdonald, Creech, Monson, & Murphy, 2016). However, change-processes facilitating the effectiveness of *SAH-M* have yet to be specified. Alexithymia, a deficit in the cognitive processing of emotional experience characterized by difficulty identifying and distinguishing between feelings, difficulty describing feelings, and use of an externally oriented thinking style, has been shown to predict PTSD severity and impulsive aggression; however, no studies have investigated the relationship between alexithymia and IPV. As such, the current study examined the role of improvements in alexithymia as a potential facilitator of treatment efficacy among 135 male veterans/service members, in a randomized control trial *SAH-M*. After an initial assessment including measures of IPV and alexithymia, participants were randomized to an *Enhanced Treatment as Usual* (*ETAU*) condition or *SAH-M*. Participants were assessed three and six months after baseline. Results demonstrated a statistically significant association between alexithymia and use of psychological IPV at baseline. Moreover, participants in the *SAH-M* condition self-reported significantly greater reductions in alexithymia over time relative to *ETAU* participants. Findings suggest that a trauma-informed intervention may optimize outcomes, helping men who use IPV both limit their use of violence and improve deficits in emotion processing.

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Intimate partner violence (IPV) is a serious and prevalent public health concern in the United States. Within the military community, intimate relationships may be particularly taxed by the range of psychological risks to which service members and veterans are subjected including exposure to combat and traumatic events (Klostermann, Mignone, Kelley, Musson, & Bohall, 2012). Veterans impacted by trauma endure unique challenges as they reconnect and renegotiate intimate partnerships (Erbes, Polusny, MacDermid, & Compton, 2008), as evidenced for example, by associations between posttraumatic stress symptoms and elevated rates of IPV use (Taft, Watkins, Stafford, Street, & Monson, 2011). As such, the need for interventions that target and redress functional deficits linked to the interpersonal consequences of trauma is pressing. Studies within military samples suggest that trauma exposure confers risk for use of violence in relationships by producing deficits in information processing, which interfere with the ability of partner violent individuals to appropriately respond to social stimuli (Taft, Walling, Howard, & Monson, 2011). Remediation of such information processing difficulties may thus facilitate reductions in the use of IPV. The current investigation tests this supposition by examining the role of *alexithymia*, a deficit in the cognitive processing of emotional experience characterized by

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http://dx.doi.org/10.1016/j.brat.2017.08.007
0005-7967/Published by Elsevier Ltd.

difficulty identifying and distinguishing between feelings, difficulty describing feelings, and use of an externally oriented thinking style (Cameron, Ogrodniczuk, & Hadjipavlou, 2014; Taylor & Bagby, 2004), in an evidence-based IPV intervention for veterans, the *Strength at Home Men's Program (SAH-M)*.

SAH-M was developed as a trauma-informed cognitive-behavioral intervention specifically designed to reduce IPV use among veterans/service members and their intimate partners. *SAH-M* was tailored to take into consideration the unique experiences of military populations that may impact IPV, including exposure to trauma and posttraumatic stress symptoms. In a recent randomized clinical trial, participants in *SAH-M* showed greater reductions in physical and psychological IPV use when compared to participants in an *Enhanced Treatment as Usual* (*ETAU*) condition (Taft, Macdonald, Creech, Monson, & Murphy, 2016), demonstrating the efficacy of *SAH-M*. However, change-processes facilitating the effectiveness of *SAH-M* have yet to be specified. Furthermore, the impact of *SAH-M* on information processing deficits associated with trauma exposure and use of violence has yet to be established.

Alexithymia refers to a specific deficit in the cognitive processing of emotional experience whose salient features have been classified in three main domains: 1) difficulty identifying and distinguishing between feelings, 2) difficulty describing feelings, and 3) use of an externally oriented thinking style (Taylor, Bagby, & Parker, 1997). Although some scholars characterize alexithymia as a relatively stable personality trait (Porcelli, Leoci, Guerra, Taylor, & Bagby, 1996; Tolmunen, Lehto, Heliste, Kurl, & Kauhanen, 2010), evidence suggests that individuals may experience significant changes in alexithymia scores over time (Porcelli, Tulipani, Di Micco, Spedicato, & Maiello, 2011), and as a function of psychological intervention (Cameron et al., 2014). For example, in a recent review of studies examining the effects of psychological interventions on alexithymia, Cameron et al. (2014) found that treatments utilizing psychoeducation and skills-training approaches to increase affect awareness were particularly likely to result in improvements in alexithymia. However, not all aspects of this multidimensional construct may be equally amenable to intervention. Specifically, evidence suggests that alexithymic deficits associated with difficulty identifying and describing feelings are more responsive to treatment than those associated with the use of an externally oriented thinking style (Cameron et al., 2014).

We identified improvements in alexithymia as a key change process of interest in the current examination for several reasons. First, *SAH-M* includes content designed to address disruptions in the cognitive processing of emotion characteristic of both posttraumatic symptomology and relationship problems. For example, *SAH-M* provides psychoeducation about the potential for trauma related symptoms to result in difficulties identifying and expressing emotions in relationships. *SAH-M* also offers skills training in conflict management, communication, and restructuring of negative thoughts. Each of these treatment components may function to promote greater introspection and to facilitate more effective identification and expression of feelings. However, whether or not *SAH-M* actually results in improvements in alexithymia remains an empirical question. Moreover, the potential contribution of alexithymia to the effectiveness of IPV intervention in veterans has yet to be examined. Answering these questions is a necessary step towards delineating factors that account for variability in treatment outcome. Indeed, scholars have highlighted the need for an increased focus on “component analyses” in clinical research, that is, investigations aimed at identification of core ingredients and treatment moderators, to optimize the effectiveness of evidence-based psychotherapeutic interventions (Emmelkamp et al., 2014).

Second, empirical evidence supports a robust and reliable association between alexithymia and posttraumatic stress disorder (PTSD: Bartholomew, Badura-Brack, Leak, Hearley, & McDermott, 2017; Brady, Bujarski, Feldner, & Pyne, 2017; Frewen, Dozois, Neufeld, & Lanius, 2008; Monson, Price, Rodriguez, Ripley, & Warner, 2004; Söndergaard & Theorell, 2004), making alexithymia a primary construct of interest in the evaluation of a trauma-informed IPV intervention. For example, in a clinical sample of psychiatric inpatients, alexithymia scores were shown to be higher among those diagnosed with PTSD compared to those without the diagnosis (Evren, Dalbudak, Cetin, Durkaya, & Evren, 2010). Furthermore, alexithymia has been shown to moderate the relationship between the number of traumas experienced and PTSD symptoms, suggesting that the role of alexithymia in the development of PTSD becomes increasingly important for multiply traumatized individuals (Park et al., 2015). This finding is of particular relevance to veterans and service members, who may be exposed to numerous traumatic experiences during the course of their military service (Kok, Herrell, Thomas, & Hoge, 2012). Importantly, evidence suggests that alexithymia is negatively associated with the perceived ability to cope with trauma among combat veterans (Bartholomew et al., 2017). Moreover, in a meta-analysis investigating the prevalence of alexithymia in individuals with PTSD, Frewen and colleagues found that alexithymia was particularly characteristic of males with combat-related PTSD (2008). In total, these findings underscore relevance of alexithymia to trauma-exposed service members and veterans.

Third, alexithymia has been associated with impulsive aggression (Teten, Miller, Bailey, Dunn, & Kent, 2008). However, we are aware of no study to date investigating the association between alexithymia and IPV specifically. Because alexithymia is posited to restrict access to emotional information (Ogrodniczuk, Sochting, Piper, & Joyce, 2012), it is theorized to impede an individual's ability to form and maintain close relationships (Kennedy & Franklin, 2002; Ogrodniczuk et al., 2012). Consistent with this theory, alexithymia has been linked with a number of specific interpersonal deficits including poor empathic abilities (Grynberg, Luminet, Corneille, Grèzes, & Berthoz, 2010) and a lower capacity to see things from the point of view of others (Moriguchi et al., 2009). Furthermore, individuals who score high on measures of alexithymia are more likely to rely on suppression as a strategy for regulating emotional experiences (Chen, Xu, Jing, & Chan, 2011; Laloyaux, Fantini, Lemaire, Luminet, & Larøi, 2015). However, use of suppression has been shown to have the ironic effect of increasing autonomic arousal (e.g., Ohira et al., 2006) and negative affect (Dalgleish, Yiend, Schweizer, & Dunn, 2009; Gross & John, 2003) both of which significantly diminish an individual's ability to effectively and flexibly resolve ambiguity or conflict in interpersonal situations (Ben-Zur, 2009). Thus, in the absence of more effective emotion regulation skills, individuals high in alexithymia may be more likely to use violence in relationships. In fact, emotion regulation difficulties in general are a well-established risk factor for use of IPV as demonstrated by numerous cross-sectional studies (Gratz & Roemer, 2004; Gratz, Paulson, Jakupcak, & Tull, 2009; McNulty & Hellmuth, 2008; Shorey, Brasfield, Febres, & Stuart, 2011; Stuart, Moore, Hellmuth, Ramsey, & Kahler, 2006). As such, interventions effective in remediating alexithymic difficulties may facilitate reductions in the use of relationship violence (Ogrodniczuk et al., 2012).

1. Current study

Although evidence suggests that alexithymia is associated with posttraumatic symptomatology, aggressive behavior, and interpersonal difficulties (e.g., Frewen et al., 2008; Monson et al., 2004; Söndergaard & Theorell, 2004; Teten et al., 2008), more research is needed to understand whether the trauma-informed treatment,

SAH-M, results in improvements in alexithymia and whether such improvements potentiate the impact of *SAH-M* on reductions in IPV use. As the preponderance of empirical evidence suggests that alexithymia may be modified with psychological interventions (Cameron et al., 2014) and *SAH-M* grants considerable attention to the cognitive processing of emotional experiences, evaluation of improvements in alexithymia as a potential change-process promoting the efficacy of *SAH-M* may be of particular clinical utility to enhancing the impact of this intervention. Therefore, this study was undertaken with the goal of investigating a partially modifiable skills deficit (i.e., alexithymia) with the potential to facilitate the effectiveness of *SAH-M*, a trauma-informed cognitive-behavioral treatment to end IPV use among veterans and service members. In keeping with this larger goal we were interested in filling gaps in the literature by testing 1) the potential association between alexithymia and IPV use, 2) whether alexithymia is improved by participation in *SAH-M*, and 3) whether improvements in alexithymia facilitate reductions in IPV use for veterans receiving *SAH-M*. As such, the following hypotheses were made.

2. Hypotheses

1). Alexithymia will be associated with IPV at baseline such that veterans with greater difficulty identifying, describing, and attending to their internal state will report greater use of IPV.

2). Veterans who receive *SAH-M* will evidence greater improvements in alexithymia relative to those who receive *ETAU*.

3). Veterans in *SAH-M* will report greater reductions in use of IPV relative to those in *ETAU* as a function of improvements in alexithymia. In other words, veterans randomized to *SAH-M* who experience improvements in alexithymia will evidence the greatest reductions in IPV.

3. Method

3.1. Participants and procedures

This study utilized data from a randomized clinical trial of *SAH-M* (Taft, Macdonald et al., 2016). In total, 135 male veteran participants were enrolled and included in the intent-to-treat analyses of the parent study. The full intent-to-treat sample was utilized in the current analyses. In the parent study, veterans were recruited from two major metropolitan areas in the Northeast by clinician-referrals, self-referrals, and court-referrals. All study procedures were approved by the Institutional Review Boards at each site. Inclusion criteria was self-, collateral- or court-report of at least one act of male-to-female physical IPV over the previous 6 months or severe physical IPV over the past 12 months, or an ongoing legal problem related to IPV. Participants were eligible for enrollment regardless of whether or not they were currently in a romantic relationship. However, of the 135 male participants enrolled, 118 (82.2%) had female partners who provided verbal informed consent for telephone interviews. The mean duration of intimate relationships between veterans and partners was 87.3 months (SD = 106.14). Exclusion criteria were current substance dependence not in remission, current uncontrolled bipolar or psychotic disorder, or severe cognitive impairment. The mean age of the sample was 37.97 (SD = 13.11) and 18.52% were nonwhite. The majority of participants (57.04%) were veterans of the recent conflicts in Iraq and Afghanistan. Although not required for inclusion in the current study, all veterans reported at least one trauma exposure in their lifetime. Over 65% of male participants reported exposure to military combat.

3.2. Procedure

As described more fully in Taft, Macdonald et al. (2016), all participants first provided written informed consent and then an initial assessment was conducted to determine their eligibility for the parent study. Veterans were randomized to receive either *SAH-M* immediately or were assigned to an *ETAU* control condition. Participants completed 3 assessments over a 6-month period of time at 3-month intervals (baseline, time 2, time 3) either in person or through web assessment (veterans) or by phone (partners). Time 2 assessments were completed immediately following *SAH-M* (or 3 months after baseline in *ETAU*). Time 3 assessments were completed 3 months following *SAH-M* (or 6 months after baseline in *ETAU*). Participants were paid 50 dollars for completing each assessment. After the baseline assessment, participants randomized to the *SAH-M* condition received a 12-session trauma-informed and cognitive-behavioral group treatment designed specifically for military populations to cease IPV (Taft, Macdonald et. al, 2016; Taft, Murphy, & Creech, 2016). *SAH-M* targets social-information processing deficits that may increase risk for IPV and consists of twelve 120-min group sessions organized into 4 treatment phases: 1) psychoeducation on IPV and common reactions to trauma; 2) conflict management skills; 3) coping strategies and negative thought patterns, and 4) communication skills. The *ETAU* condition received referrals to mental health and IPV treatment resources within and outside the VA system, in addition to a check-in call between assessments.

3.3. Measures

3.3.1. Intimate partner violence

Physical and psychological IPV use were measured using the Physical Assault (12 items) and Psychological Aggression (8 items) subscales of the *Revised Conflict Tactics Scales* (CTS2; Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Both male participants and their female partners reported the frequency of IPV behaviors used by the male participant in the past 3 months on a scale ranging from 0 (*never*) to 6 (*more than 20 times*). The larger of the two individual item responses was used in the calculation of CTS2 scores (Taft et al., 2010). Thus, CTS2 scores consisted of the sum of the highest endorsements for each item regardless of the source to mitigate underreporting. All IPV subscale scores were computed by summing the number of positively endorsed items, known as "variety scores." This method of scoring reduces skewness caused by a small number of high-rate offenders, gives equal weight to each abusive behavior, and is most defensible with respect to memory limitations regarding behavior frequencies (Moffitt et al., 1997).

3.3.2. Alexithymia

The 20-item Toronto Alexithymia Scale (TAS-20) was used to assess alexithymia (Bagby, Parker, & Taylor, 1994). The TAS-20 yields an overall alexithymia score (TAS-total) in addition to three subscale scores: difficulty identifying feelings (TAS-DIF; e.g., "I am often confused about what I am feeling,"), difficulty describing/expressing feelings (TAS-DDF; e.g., "People tell me to describe my feelings more,"), and externally-oriented thinking (TAS-EOT; e.g., "I prefer to talk to people about their daily activities rather than their feelings."). Items are rated on a 5-point Likert-type scales ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating greater alexithymia. The TAS-20 total score and the DIF and DDF subscales have demonstrated validity and acceptable reliability in clinical populations (Bagby, Taylor, Quilty, & Parker,

2007; Thorberg et al., 2011). However, the EOT subscale frequently shows poor internal reliability (e.g., Grynberg et al., 2010; Jonason & Krause, 2013; Kojima, Frasure-Smith, & Lesperance, 2001). In the current study, internal consistency was high for the TAS-total scale ($\alpha = 0.92$), good for the TAS-DIF ($\alpha = 0.87$), and acceptable for the TAS-DDF ($\alpha = 0.73$). The TAS-EOT subscales internal consistency fell in the unacceptable range ($\alpha = 0.48$), raising questions about the reliability of this subscale. However, because the overall internal consistency of the measure when including the full 20 items was high ($\alpha = 0.92$), all items were retained in the TAS-total analyses.

3.4. Statistical analyses

All analyses were conducted on the intent-to-treat sample. For hypothesis 1, regression analyses were employed to examine the effect of alexithymia on IPV using SPSS (Version 20). Eight separate models were constructed; four for physical IPV and four for psychological IPV, with TAS-Total, TAS-DIF, TAS-DDF, and TAS-EOT entered as unique predictors. Examination of the distributions for baseline physical and psychological IPV scores revealed positively skewed data with variances exceeding conditional means, qualities common to count data. As such, we used Poisson regression to model the effect of alexithymia on IPV at baseline. Poisson models provide parameter estimates based on the log value of the outcome variables, precluding meaningful interpretation of regression coefficients. Thus, interpretation of the regression parameters are better expressed in terms of incident rate ratios (i.e., IRRs) obtained by exponentiation of the regression coefficient. An IRR can be interpreted similar to an odds ratio except that outcome of interest is the rate of incidents rather than the odds of an incident occurring. That is, for each one-unit change in the predictor variable, the rate of outcome incidents changes by a factor of (IRR-1) x 100%. We calculated parameter estimates utilizing maximum likelihood estimation with robust standard errors, as recommended by Cameron and Trivedi (2009).

For hypotheses 2 and 3, growth curve modeling was used to examine within (level 1) and between (level 2) individual change over time using Hierarchical Linear Modeling (HLM Version 7). In the current study, growth curve modeling was used to estimate the effect of treatment on changes in men's self-reported alexithymia and IPV over time. Using a model building approach (Singer & Willet, 2003) unconditional growth models were estimated for hypotheses 2 and 3. Findings indicated that significant variability was left to be explained in alexithymia, physical IPV, and psychological IPV, suggesting it was appropriate to continue with the model building approach. For all models, natural log of time was centered at baseline (King et al., 2006). To examine the effect of treatment condition on changes in alexithymia over time (hypothesis 2), time was entered at level 1 and condition at level 2 with alexithymia as the outcome variable in the final model. Four separate models were conducted for TAS-Total, TAS-DIF, TAS-DDF, and TAS-EOT. To examine the conditional rate of change in IPV between treatment conditions as a function of alexithymia (hypothesis 3), time and alexithymia were entered as time varying covariates at level 1, treatment condition at level 2, and IPV as the outcome variable in the final model. For hypothesis 3 models, alexithymia was centered at the grand mean.

4. Results

4.1. Correlation analyses

Table 1 presents the correlations among variables at baseline. Across time points, physical IPV was significantly related to psychological IPV (T2: $r = 0.61$, $p < 0.001$; T3: $r = 0.46$, $p < 0.001$), but none of the alexithymia variables. The patterns of association between psychological IPV and alexithymia at each time point were more variable. At T2, psychological IPV was significantly related to the DIF subscale of the TAS-20 ($r = 0.21$, $p < 0.05$), but not the DDF subscale ($r = 0.15$, $p = 0.15$), EOT subscale ($r = 0.08$, $p = 0.42$) or the Total scale ($r = 0.18$, $p = 0.08$). At T3, psychological IPV was related to all alexithymia scales (Total scale, $r = 0.32$, $p < 0.01$; DIF, $r = 0.39$, $p < 0.001$; and DDF, $r = 0.26$, $p < 0.05$), except the EOT subscale ($r = 0.11$, $p = 0.31$).

Table 1
Baseline correlation matrix.

	1	2	3	4	5	6
1. TAS-Tot	–					
2. TAS-DIF	0.89**	–				
3. TAS-DDF	0.84**	0.63**	–			
4. TAS-EOT	0.71**	0.38**	0.48**	–		
5. IPV-Psych	0.21*	0.20*	0.13	0.23**	–	
6. IPV-Phys	0.06	0.09	−0.00	0.06	0.56**	–

Note. TAS-Tot = Total score on the Toronto Alexithymia Scale − 20; TAS-DIF = Difficulty Identifying Feelings subscale of the TAS-20; TAS-DDF = Difficulty Describing Feelings subscale of the TAS-20; TAS-EOT = Externally Oriented Thinking subscale of the TAS-20; IPV-psych = Intimate partner violence-psychological aggression; IPV-Phys = Intimate partner violence-physical aggression; *p < 0.05; **p < 0.01; ***p < 0.001.

4.2. Regression analyses

Table 2 presents the effects of alexithymia on IPV at baseline (hypothesis 1). Computation of regression equations for baseline physical IPV produced nonsignificant parameter estimates for all alexithymia variables (TAS-20 Total scale $\chi^2_{wald} = 0.46$, $p = 0.50$, DIF subscale $\chi^2_{wald} = 1.03$, $p = 0.31$, DDF subscale $\chi^2_{wald,} = 0.00$, $p = 0.98$, and EOT subscale $\chi^2_{wald,} = 0.45$, $p = 0.50$). However, the TAS-20 Total scale ($\chi^2_{wald} = 5.38$, $p = 0.02$), DIF ($\chi^2_{wald} = 4.78$, $p = 0.03$), and EOT ($\chi^2_{wald} = 7.03$, $p = 0.01$) subscales emerged as significant predictors of psychological IPV. Significant variance in psychological IPV was not explained by the DDF subscale ($\chi^2_{wald} = 1.76$, $p = 0.18$).

4.3. Growth curve modeling

Descriptive data on alexithymia and IPV use by condition and time are reported in Table 3. Fixed and random effects for final multilevel longitudinal growth models are presented in Table 4. Model A is the final growth model for examining the effect of treatment condition on changes in alexithymia over time

Table 2
Poisson regression models testing effects of alexithymia on baseline psychological and physical IPV.

IPV Model	χ^2_{wald}	IRR	95% CI
Psychological Aggression			
TAS-Total	5.38*	1.01	[1.00–1.02]
DIF	4.78*	1.02	[1.00–1.03]
DDF	1.76	1.02	[0.99–1.04]
EOT	7.03**	1.03	[1.01–1.05]
Physical Assault			
TAS-Total	0.46	1.00	[0.99–1.02]
DIF	1.03	1.01	[0.99–1.04]
DDF	0.00	1.00	[0.96–1.04]
EOT	0.45	1.01	[0.98–1.05]

Note. TAS = Toronto Alexithymia Scale-20; TAS-Total = Total TAS-20 score; DIF = Difficulty Identifying Feelings subscale of the TAS-20; DDF = Difficulty Describing Feelings subscale of the TAS-20; TAS-EOT = Externally Oriented Thinking subscale of the TAS-20; IPV = Intimate partner violence; *p < 0.05; **p < 0.01.

Table 3
Descriptive statistics and mean differences in alexithymia by condition and time.

	SAH-M			ETAU			Mean Comparisons		
	Mean (SD)			Mean (SD)			T-test (Cohen's *d*)		
	T1	T2	T3	T1	T2	T3	T1	T2	T3
TAS-20									
Total	56.58 (15.26)	53.01 (13.36)	51.7 (13.79)	57.91 (10.99)	58.48 (11.99)	57.99 (12.74)	−0.58 –	−2.12* (0.43)	−2.48* (0.51)
DIF	18.88 (7.70)	17.73 (6.82)	16.93 (6.86)	19.65 (6.51)	19.94 (6.90)	20.19 (6.93)	−0.63 –	−1.59* (0.32)	−2.27* (0.47)
DDF	15.08 (4.95)	14.35 (4.03)	13.36 (4.28)	16.39 (3.73)	16.24 (4.20)	16.19 (4.57)	−1.73 –	−2.25* (0.46)	−3.06** (0.64)
EOT	22.40 (4.69)	20.96 (4.32)	20.90 (4.33)	21.88 (4.01)	22.3 (4.50)	21.62 (3.80)	0.69 –	−1.48 (0.30)	−0.86 (0.18)
IPV									
Psych	4.43 (2.37)	2.81 (2.27)	3.04 (2.57)	4.46 (2.21)	3.87 (2.61)	3.69 (2.27)	−0.08 –	−2.31* (0.43)	−1.41 (0.27)
Phys	2.82 (2.65)	0.71 (1.47)	0.80 (2.32)	2.51 (2.57)	1.69 (2.70)	0.80 (1.71)	0.68 –	−2.40* (0.45)	−0.01 (0.00)

Note. SAH-M = Strength at Home Men's Program; ETAU = Enhanced Treatment as Usual; TAS-20 = Toronto Alexithymia Scale-20; DIF = Difficulty Identifying Feelings subscale of the TAS-20; DDF = Difficulty Describing Feelings subscale of the TAS-20; EOT = Externally Oriented Thinking subscale of the TAS-20; IPV = Intimate partner violence; Psych = psychological aggression; Phys = Physical assault; $^{*}p < 0.05$; $^{**}p < 0.01$.

Table 4
Growth curve modeling results.

	Alexithymia				IPV	
	TAS Total	DIF	DDF EOT		Psychological Aggression	Physical Assault
	Model A	Model B	Model C	Model D	Model E	Model F
Fixed Effects						
Intercept	57.86	19.65	16.28	21.89	1.49	0.78
(initial status)	(1.33)***	(0.72)***	(0.45)***	(0.43)***	(0.06)***	(0.13)***
Treatment Condition	−1.19	−1.34	−1.59	−0.18	−0.05	0.07
	(2.24)	(1.08)	(0.68)*	(0.65)	(0.09)	(0.18)
Time	−0.16	0.14	−0.11	−0.27	−0.32	−1.69
(rate of change)	(1.22)	(0.77)	(0.45)	(0.50)	(0.09)***	(0.28)***
Treatment Condition	−3.81	−1.60	−0.93	−0.88	−0.35	−0.95
	(1.75)*	(1.08)	(0.66)	(0.76)	(0.16)*	(0.42)*
TAS-20	–	–	–	–	0.01	0.00
					(0.01)	(0.02)
Treatment Condition	–	–	–	–	−0.01	0.00
					(0.01)	(0.03)
Variance Components						
Intercept	123.61	31.65	12.44	10.48	0.07	0.55
	(11.12)***	(5.63)***	(3.53)***	(3.24)***	(0.27)	(0.74)***
Rate of change	1.39	1.84	0.29	0.10	0.18	1.63
	(1.18)	(1.36)	(0.54)	(0.31)	(0.18)	(1.28)***
TAS-20	–	–	–	–	0.00	0.01
					(0.01)	(0.10)
Deviance	2432.39	2060.27	1752.31	1772.83	–	–

Note. TAS-Total = Total Score of the Toronto Alexithymia Scale − 20; DIF = Difficulty Identifying Feelings subscale of the TAS-20; DDF = Difficulty Describing Feelings subscale of the TAS-20; EOT = Externally Oriented Thinking subscale of the TAS-20; IPV = Intimate partner violence; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

(hypothesis 2). Results indicate no significant group differences in participants' baseline report of alexithymia between *SAH-M* and *ETAU*. With regard to changes in the total alexithymia scores over time, on average, participants in the *SAH-M* condition self-reported significantly greater reductions in alexithymia over time relative to *ETAU* participants. Fig. 1 depicts changes in TAS-20 total scores over time by treatment condition. However, there were no significant condition effects on the changes in DIF (Model B), DDF (Model C), or EOT (Model D) TAS-20 subscales over time.

Models E and F are the final growth models for examining whether changes in alexithymia account for variance in the association between treatment condition and IPV (hypothesis 3), specifically psychological IPV and physical IPV, respectively. Because TAS-DIF, TAS-DDF, and TAS-EOT did not evidence significant changes over time by condition, these variables were not included in any higher-level modeling. Models E and F were estimated using a Poisson sampling distribution with log-link function given the positive skewness of IPV count data. Results indicate that on average, participants in the *SAH-M* condition evidenced lower psychological and physical IPV over time relative to *ETAU* participants; however, changes in TAS-20 total scores over time do not appear to account for unique variance in this effect.

5. Discussion

The aim of this study was to investigate the role of alexithymia, a deficit in the ability to perceive, differentiate, and reflect on affective states, on IPV use among veterans who completed an evidence-based and trauma-informed IPV treatment program—*SAH-M*. The current study contributes to the literature on the treatment of IPV use by examining the role of improvements in alexithymia as a potential facilitator of treatment efficacy. Taken together, the findings from the current study represent a novel contribution to the literature on the treatment of IPV use in individuals impacted by trauma and suggest that a trauma-informed intervention may optimize outcomes, helping men who use IPV both limit their use of relationship violence and reduce alexithymia.

First, we hypothesized that veterans higher in alexithymia

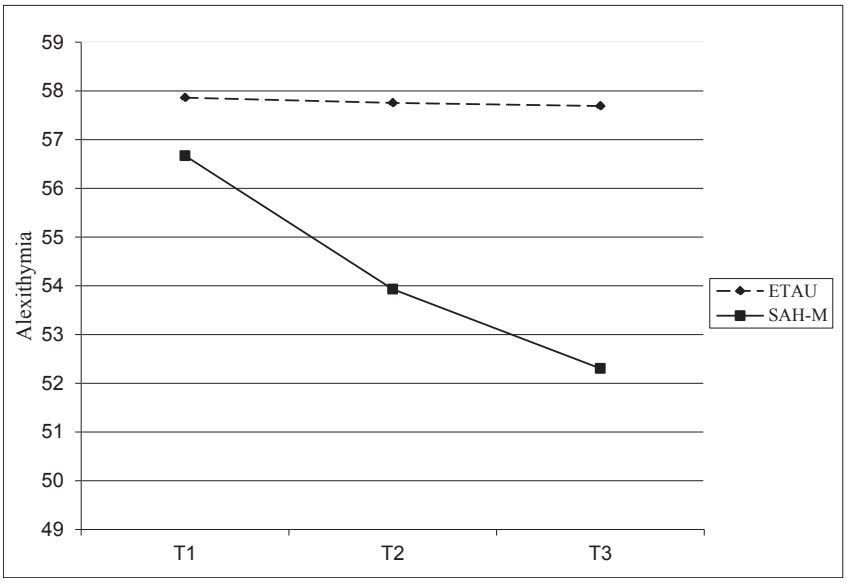

Fig. 1. Effect of treatment condition on alexithymia over time.
Note. SAH-M = Strength at Home Men's Program; ETAU = Enhanced Treatment as Usual; T1- T3 = Time 1 to Time 3.

would report greater use of IPV prior to treatment initiation. Alexithymia was not associated with greater use of physical assault, it did however, predict psychological aggression. Findings suggest that men, higher in alexithymia, and specifically, those who report greater difficulty identifying their internal state and greater use of an externally oriented thinking style, are more likely to engage in coercive verbal (e.g., insulting or swearing) and nonverbal behavior (e.g., slamming doors or smashing objects) in intimate relationships. Although we predicted a significant association between physical assault and alexithymia, the lower base rate of physical assault relative to psychological aggression in this sample also reflects less power to detect an effect. Additionally, psychological aggression and alexithymia share modes of expression. Psychological aggression largely impacts forms of verbal communication, while alexithymia reflects (in part) difficulty putting words on feelings. By contrast, physical assault does not necessarily draw on language and may therefore be less impacted by alexithymia. Although, prior research has demonstrated an association between emotion regulation difficulties and IPV (e.g., Gratz & Roemer, 2004; Gratz et al., 2009; McNulty & Hellmuth, 2008; Shorey et al., 2011; Stuart et al., 2006), to our knowledge this is the first investigation to establish an association between IPV and alexithymia specifically. These findings contribute to the growing body of literature linking alexithymia to a range of interpersonal consequences (e.g., Grynberg et al., 2010; Moriguchi et al., 2009).

Second, we hypothesized that veterans who received the trauma-informed *SAH-M* intervention would evidence greater improvements in alexithymia relative to those in the *ETAU* condition. Consistent with this hypothesis, results suggest that although *SAH-M* and *ETAU* participants reported similar levels of alexithymia at baseline, they differed significantly in their reports of alexithymia over time such that men randomized to *SAH-M* reported significant declines in alexithymia after intervention whereas participants in the *ETAU* condition report very little change in alexithymia symptoms. These results indicate that the interventions delivered in this 12-week group therapy effectively targeted and ameliorated emotion processing difficulties constituent of alexithymia. Taken together with the observed association between alexithymia and use of psychological aggression, results suggest that the trauma-informed intervention strategies of *SAH-M* may help men who use IPV distinguish among their own high-arousal emotions to attend to, identify, and express feelings other than anger.

Lastly, we hypothesized that changes in alexithymia symptoms would facilitate the reductions in IPV use observed as an outcome of *SAH-M* treatment. While veterans in the treatment condition did endorse improvements in their self-reported abilities to attend to, identify, and describe emotions, there was no evidence that these improvements in alexithymia explained variability in treatment outcome over and above the effects of treatment condition. Perhaps this finding can be explained by the range of change processes putatively targeted by *SAH-M*. The components of the program were designed to increase knowledge and skills to remediate a variety of social information processing deficits associated with IPV use in veterans. These include interventions aimed at helping participants to develop effective conflict resolution skills, enhance intimacy and closeness in relationships, and reduce the negative effects of stress on relationships. Although improvements in alexithymia likely support skill building in these domains, it may be that changes in cognitive (e.g., increased ability to challenge hostile attributions), behavioral (e.g., greater use "time outs" to deescalate conflict), and/or motivational (e.g., enhanced readiness for change) deficits may have diluted any potential role of improvements in alexithymia on the effectiveness of *SAH-M* to reduce IPV. These empirical questions should be addressed in future research.

The findings in the present study have important implications for IPV use interventions for veterans. The relationship between IPV use treatment and reductions in alexithymia is of particular interest. Although reductions in IPV use after treatment were not associated with alexithymia, a decrease in alexithymia may still translate into enhanced skillfulness in the ability to process ambiguous or stressful social information. For example, amelioration of alexithymia may yield significant improvements in general relationship functioning and conflict that are not captured in the CTS2 (Straus et al., 1996). Enhancing emotion processing skills may be particularly important for recently returning veterans, as research has shown that this population experiences higher levels of family related stress as part of their readjustment to civilian life, thus increasing their exposure to highly arousing conflict (Gewirtz, Erbes, Polusny, Forgatch, & DeGarmo, 2011). Notably, in the present sample, the majority of participants (57.0%) were veterans of the

recent conflicts in Iraq and Afghanistan. Interventions such as *SAH-M* that effectively mitigate barriers to accurate identification and description of one's own emotions, may function to minimize social stressors associated with readjustment to civilian life and empower veterans to more effectively address interpersonal conflict when it arises.

Study findings should be considered in light of several limitations. Importantly, this study exclusively relied on self-report measures to assess changes processes and outcomes of interest. Given social proscriptions against relationship violence (e.g., Basow, Cahill, Phelan, Longshore, & McGillicuddy-DeLisi, 2007), participants may have underreported the frequency of IPV use in the service of socially desirable responding. Additionally, people with a high degree of alexithymia may not be reliable or accurate in their self-assessment of these same deficits on a self-report scale (Leising, Grande, & Faber, 2009), particularly given that doing so would likely require the relative absence of alexithymia. As such, future investigations would benefit from inclusion of performance-based measures of cognitive processing of emotional experiences along with a multimethod assessment of IPV use. Evaluation of the unique contributions of alexithymic deficits characterized by an externally oriented thinking style on IPV and treatment outcome was limited by the poor reliability of the TAS-EOT subscale in this sample. Results on this subscale should be interpreted with caution. Moreover, although the effects of treatment on alexithymia were statistically significant, the magnitude of these effects fell between the small to moderate range. More research is needed to determine the clinical significance of such modest improvements in emotional functioning. Moreover, as, the study included heterosexual men veterans/service members who use IPV, the generalizability of findings is limited by the nonrepresentative study sample. As a result, study findings should not be generalized to all who use IPV. Future research should examine the utility of addressing alexithymia in the treatment of individuals who use violence in non-heterosexual relationships as well as in treatment with women who use violence in relationships. Testing these models in civilian populations is also warranted in order to understand these relationships outside of the military context. Finally, future longitudinal research is needed to fully elucidate relationships among trauma-exposure, alexithymia, and IPV in order to advance theory and to refine interventions to maximize effectiveness of emotion-focused components of treatments.

Despite these limitations, results from this study represent an important contribution to the literature in that they provide novel evidence for an association between alexithymia and IPV and indicate that alexithymic deficits can be effectively addressed in a trauma-exposed population of men who use IPV. It appears that a trauma-informed group intervention can not only reduce use of violence in relationships but can also work to improve cognitive deficits in emotion processing relevant to the maintenance of healthy intimate relationships and social bonds. It is hoped that these findings will encourage further refinement of emotion-focused content in IPV interventions to optimize impact and efficacy.

Funding and support

This work was supported by a grant from the Department of Defense, PT073945. ClinicalTrials.gov identifier: NCT01435512.

Disclaimer

The contents of this manuscript are those of the authors and do not necessarily represent the views of the Department of Veterans Affairs, or the United States Government.

Potential conflicts of interest

None.

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