

Brief measure of posttraumatic stress reactions: Impact of Event Scale-6

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Abstract

Background The Impact of Event Scale-revised (IES-R) is one of the most widely used measures of posttraumatic stress reactions. However, for some purposes, such as large epidemiological studies, there is a need for briefer instruments. The aim of this study was to develop and validate an abbreviated version of the IES-R that could capture the three current symptom clusters of posttraumatic stress disorder (PTSD).

Methods Stepwise multiple regression was applied to abbreviate the IES-R in one sample. The abbreviated version was then tested in three separate samples of individuals exposed to different kinds of potentially traumatic events. Agreement with a reference measure of PTSD, the

PTSD checklist (PCL), was calculated for the abbreviated and the full-scale versions of IES.

Results The abbreviation procedure resulted in a subset of six items (the IES-6), which correlated highly (pooled correlation = 0.95) with the IES-R across samples. Correlations between the IES-6 and IES-R subscales were somewhat lower ($r = 0.78\text{--}0.94$). Both the IES-6 and IES-R were in high agreement with the PCL.

Conclusion The IES-6 appears to be a robust brief measure of posttraumatic stress reactions. It may be useful for research in epidemiological studies, and it may also have a role as a screening instrument in clinical practice.

Keywords Stress disorders · Posttraumatic · Instrumentation · Epidemiology · Questionnaires

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Introduction

Research in the last two decades has revealed that traumatic events occur far more often than what has been previously assumed [1]. Posttraumatic stress disorder (PTSD) is a highly prevalent condition with great human and societal costs [2]. Several measures of PTSD have been developed. However, in some situations, for example in large epidemiological studies, or in screening of large samples, studies do not permit inclusion of comprehensive scales. The Impact of Event Scale (IES) is one of the most commonly used measures of PTSD. This paper aims to develop an abbreviation of the IES.

The Impact of Event Scale-revised (IES-R) is a 22-item self-report measure of subjective distress following exposure to traumatic events [3]. The original IES [4] predated the introduction of the diagnosis of PTSD and comprised 15 items measuring 2 of the 3 symptom clusters of PTSD;

reexperiencing/intrusion and avoidance/numbing. In the IES-R seven items measuring hyperarousal, the third symptom cluster of PTSD, were added. In addition, the IES response categories were altered for the IES-R. The response format in the IES referring to the frequency of symptoms (not at all = 0, rarely = 1, sometimes = 3, and often = 5) was changed to measure symptom severity in the IES-R (0 = not at all, 1 = a little bit, 2 = moderately, 3 = quite a bit, and 4 = extremely). The IES-R can be used to generate a sum score, reflecting level of posttraumatic stress reactions. Alternatively, means for each of the subscales (intrusion, avoidance/numbing and hyperarousal) can be generated [5]. The IES has been shown to perform very well as a screening instrument for PTSD [6, 7]. Several studies have supported the reliability and validity of the IES-R in various populations of trauma exposure, and in various cultures [8–12].

Several other self-report instruments for posttraumatic stress reactions have also been developed. In a review, Norris and Hamblen [13] identified 17 PTSD scales, most of them ranging from 17 to 33 items. Some of these scales have previously been abbreviated. The 4-item SPAN is an abbreviation of the Davidson trauma scale [14–16]. The PTSD check list (PCL) [17] has been abbreviated into a 4-item and a 6-item short form [18, 19]. The 10-item trauma screening questionnaire (TSQ) is an abbreviation [20] of the PTSD symptom scale self-report version (PSS-SR) [21]. The TSQ has been shown to have a convincing capacity to predict PTSD diagnosis even when replicated in independent samples [20, 22]. One drawback with the TSQ is that the response categories are dichotomous (yes/no), resulting in less sensitivity for variation in symptom severity. All these studies concluded that the short versions perform as well as the longer scales from which they were derived. However, none of these short scales have been tested in diverse trauma populations. It is also notable that none of these abbreviated PTSD scales capture the three symptom clusters of DSM-IV PTSD diagnosis. To the best of our knowledge, no abbreviation of the IES or the IES-R has yet been developed and tested.

The purpose of the current study was to develop an abbreviated version of the IES-R that captured the three current PTSD symptom clusters and to determine its validity across different populations exposed to a variety of traumatic events.

Method

Participants

Sample 1 consisted of a diverse group of Norwegian disaster personnel mobilized for the 2004 Southeast Asia tsunami

disaster ($N = 626$), with three subgroups: (1) personnel who were present in a disaster-stricken area at the time of the disaster and exposed to life threat ($N = 45$); (2) personnel deployed to the disaster area ($N = 335$) exposed to witnessing experiences/grotesque impressions of the disaster scene; (3) home-based personnel ($N = 246$) exposed to stressful personal contact with disaster victims and their next of kin. The personnel included police officers, humanitarian aid workers, health personnel, journalists, and chaplains. Participants responded to a comprehensive questionnaire 9–10 months post-disaster. The response rate was 55%, the mean age was 44 ($SD = 9.9$), 59% were men and 41% were women.

Sample 2a consisted of Norwegian tourists repatriated from tsunami-affected areas of Southeast Asia in the days following the 2004 tsunami ($N = 899$). The study population included all individuals registered by the police upon their arrival at the national airport who were at least 18 years old. They were mailed a questionnaire 6 months after the tsunami. The response rate was 36%, the mean age was 43 years ($SD = 12.9$), 47% were men and 53% were women. This was a longitudinal investigation, and the data in sample 2a represented information collected at time 1. *Sample 2b* consisted of follow-up data on the same population (time 2, 2 years post-disaster). Sample 2b was used to compare the performance of the abbreviated IES with the full-scale IES-R against an external reference measure of PTSD (the PTSD checklist). Respondents in sample 2b were partly overlapping with respondents in sample 2a (674 individuals participated at both time points), with a somewhat larger N (1,179) at time 2 (505 individuals participated at time 2 only). The response rate was 50%, the mean age was 45 years ($SD = 12.9$), 49% were men and 51% were women.

Sample 3 consisted of Norwegian adult victims of non-domestic violence ($N = 143$). The subjects were recruited from emergency units and police departments in two Norwegian cities. The study combined data collected by comprehensive questionnaires and semi-structured interviews 1–16 weeks after exposure. The response rate was 76%, the mean age was 31 years ($SD = 11.0$), 80% were men and 20% were women. This was a longitudinal study, and the sample 3 data represented information collected at T1.

Sample 4 consisted of consecutive referrals to a traumatic stress service in Wales who had been exposed to various traumatic events and completed the IES-R as part of their assessment ($N = 122$). The mean age was 42 years ($SD = 12.1$), 48% were men and 52% were women.

The Norwegian Medical Ethics Committee and the Norwegian Social Science Data Services approved of studies 1, 2, and 3. A complete description of the study was given to all participants, and returning the questionnaire

was taken as informed consent in accordance with Norwegian law. For the interview part of study 3, written informed consent was obtained from all participants. In study 4, data was collected to audit the medical service, and did not require ethical approval.

More detailed descriptions of the subjects and methods in samples 1, 2, and 3 are reported elsewhere [23–25]. There are no previous publications based on data from sample 4.

The abbreviation of IES-R was performed in sample 1, and then rerun in samples 2a, 3 and 4 (two Norwegian and one British sample). Estimating the agreement with the PTSD checklist (PCL) was performed in sample 2b.

Measures

Demographic variables included gender and age. Sample 1 was categorized into three age groups: (1) 19–40 years, (2) 41–50 years, (3) 51–80 years. In the smaller samples 3 and 4 two age groups were used. Age groups for sample 3 were (1) 18–30 years, (2) 31–75 years, and for sample 4: (1) 18–49 years, (2) 50–75 years.

Exposure

Life threat was assessed as present or not present in samples 2 and 3. In sample 2 (tsunami disaster victims), informants were asked to report the degree of life threat they were exposed to in the disaster (none, small, moderate, great, or overwhelming danger of dying). In this study, “life threat” refers to great or overwhelming danger of dying ($N = 204$), and “no life threat” to the other categories ($N = 595$). In sample 3 (victims of violence), informants were asked to report the degree of life threat they perceived during the assault [felt life was at risk; fear of severe physical injury (but life not at risk); understood danger only afterwards; did not perceive the situation as dangerous; did not remember]. In this study, “life threat” refers to those who felt life was at risk or experienced fear of severe physical injury ($N = 73$), and “no life threat” to the other categories ($N = 42$).

Witnessing experiences were measured in sample 1 for the personnel deployed to the disaster area ($N = 335$). Witnessing experiences included strong sensory perceptions, seeing dead bodies, seeing body parts, and witnessing disaster victims searching for next of kin. The mean number of witnessing experiences was 4.8 (SD = 2.0) on a 0–8 scale. “Low” exposure to witnessing experiences refers to the group reporting less than the mean ($N = 137$), and “high” to the group reporting the mean level or above ($N = 198$).

Traumatic loss was measured in sample 2 only, and refers to the loss of a close relative or a close friend in the tsunami disaster ($N = 66$).

Exposure was not assessed in sample 4, as this was a mixed clinical sample. All respondents in sample 4 were patients presenting at a trauma clinic, having experience one or more traumatic events.

Stress reactions

The IES-R [3] was completed by all four samples. In all samples, the IES was anchored to a specific event: the tsunami disaster (samples 1 and 2), the violent episode (sample 3), and the traumatic event the patients sought therapy for (sample 4). In samples 1 and 3, response categories from the original IES were used (not at all = 0, rarely = 1, sometimes = 3, and often = 5). In samples 2 and 4, the IES-R response categories were used (0 = not at all, 1 = a little bit, 2 = moderately, 3 = quite a bit, and 4 = extremely). In samples 1, 2 and 3, a Norwegian version of the IES-R was used. The original English version of the IES-R was applied in sample 4.

The PCL [17] was used as a reference measure of PTSD in sample 2b (tsunami disaster victims, T2). In the PCL, respondents are asked to report how often they have been bothered by 17 PTSD symptoms during the last month on a 5-point scale (from 1 = not at all to 5 = extremely). The PCL-S [26], which was designed to measure reactions to a specific event, was used in this study. As with other self-report measures of PTSD, optimal cutoff scores may vary between different populations. The cutoff score of 50 used in the initial psychometric investigation of PCL in a sample of Vietnam veterans [27] has subsequently been criticized for being too high, resulting in low sensitivity [16]. Other studies have recommended cutoff scores of 31 in Veterans Administration primary care clinics [16], 38 and 30 in female samples [28, 29], 37 in older primary care patients [30], 44 in accident and sexual assault victims [31], and 30–34 in Iraq veterans [19]. In this study, we used a cutoff value of 32, corresponding to the median value of the optimal range in the latter study. We also looked at performance using the higher cutoff score of 40. Another way to score the PCL is to follow the diagnostic symptom criteria. However, the validity of the symptom cluster method of scoring has been less investigated [32], and hence was not used in this study.

Statistical procedures

Abbreviation of IES-R

Stepwise multiple regression analysis was used to identify which combination of items that explains the maximum proportion of variance of the full-scale sum score. This regression procedure was performed in sample 1 with the IES-R sum score as the dependent variable, entering all 22

single items as independent variables, using the forward stepwise command. We decided a priori that our subset should consist of two items from each of the three subscales. If more than two items from the same subscale were chosen with this procedure, the first two would be retained, and all items from the other subscales not chosen so far would be entered as candidates for further inclusion. The results of this procedure were compared with the results of performing separate regressions for each subscale. Although the two statistical methods gave very similar results, the sum score regression performed somewhat better, and hence, was retained.

The explained variance (R^2_{adjusted}) of the IES-R by these six items (IES-6) was calculated. To investigate potential loss of subscale reliability, intercorrelations between the two items belonging to the same subscales in IES-6 were compared to mean inter-item correlations of the full IES-R subscales. The latter were estimated by transforming observed inter-item correlations to Fisher's z' scores, mean calculation, and then backtransformation of the mean z' scores to an expression of the mean correlation. Cronbach's Alpha for the IES-6 is presented. To consider if weighting of the six items would improve the performance of IES-6, the correlation between the score from the original instrument and the 6-item weighted sum score (expressed by the square root of the R^2_{adjusted} for the regression in sample 1) was compared with the correlation between the unweighted IES-6 sum score and the IES-R sum score.

Correlations between IES-6 and IES-R

The IES-6 sum score was correlated with the IES-R sum score in all four samples and subgroups of the samples, and 95% confidence intervals of the correlations were calculated. The same procedure was applied to compare IES-6 subscales with IES-R subscales. As an estimate of the pooled correlation across samples, we transformed observed main correlations in all four samples to Fisher's z' scores, calculated the mean, and then backtransformed the mean z' score, without weighting for sample size.

Comparing the performance of the abbreviated IES with the full-scale IES-R against the external reference measure of PTSD (the PCL-S)

We calculated sensitivity, specificity, negative and positive predictive value, and overall efficiency for a range of cutoffs for the IES-6 and the IES-R, using the PCL with a cutoff of 32 as a proximate measure of PTSD. Receiver operating characteristic (ROC) curves were plotted for the IES-6 and the IES-R, and corresponding nonparametric estimates of areas under the curve (AUCs) were estimated for PCL with a cutoff of 32 and 40. All analyses were

performed in SPSS-16 for Windows, except for calculations of 95% confidence intervals of correlations, which was performed in MATLAB[®] version 2007b.

Results

Abbreviation of IES-R (Sample 1)

The first four IES items identified in the regression procedure consisted of two intrusion items, one avoidance item, and one hyperarousal item. The fifth item represented a third item from the intrusion subscale. The first four items were retained, and all items representing the avoidance and hyperarousal subscales not chosen so far were entered as candidates for further inclusion. This procedure resulted in one additional avoidance item and one additional hyperarousal item being chosen, thus resulting in two items from each of the three subscales.

The six single items (IES-6) identified by this stepwise regression procedure are displayed in Table 1. These six items achieved an explained variance (R^2_{adjusted}) of the IES-R sum score of 0.91.

Cronbach's Alpha for the IES-6 was 0.80. The intercorrelation between the two items belonging to the same subscale was 0.56 for intrusion, 0.46 for avoidance, and 0.48 for hyperarousal. The mean inter-item correlation between the full subscales of the IES-R was 0.48 for intrusion (8 items), 0.41 for avoidance (8 items), and 0.48 for hyperarousal (6 items). The correlation between a sum score in which each item was weighted by its regression coefficient and the score from the original instrument was 0.96. This value was almost identical to the correlation

Table 1 The six single items (IES-6) identified by multiple regression analysis in sample 1 with IES-R sum score as dependent variable ($N = 595$)

| IES item ^a | Subscale | Beta* | 95% CI of beta |
|--|----------|-------|----------------|
| I thought about it when I didn't mean to | I | 0.265 | (0.233–0.297) |
| I felt watchful or on-guard | H | 0.225 | (0.196–0.254) |
| Other things kept making me think about it | I | 0.283 | (0.254–0.312) |
| I was aware that I still had a lot of feelings about it, but I didn't deal with them | A | 0.200 | (0.170–0.230) |
| I tried not to think about it | A | 0.181 | (0.153–0.210) |
| I had trouble concentrating | H | 0.171 | (0.142–0.200) |

I intrusion, *A* avoidance, *H* hyperarousal, $r^2_{\text{adjusted}} = 0.91$

* $P < 0.001$ for all presented betas

^a Items are presented in the order they were chosen by the regression procedure

found between the unweighted IES-6 sum score and the IES-R sum score (also 0.96), meaning that no information was gained by weighting the items in the short form sum score.

Correlations between IES-6 and IES-R (samples 1–4)

The IES-6 sum score correlated ≥ 0.90 with the IES-R in all four samples, across gender and age (Table 2). The pooled correlation for the four samples was 0.95.

The IES-6 sum score correlated highly with IES-R across type of traumatic exposure and exposure severity in the three samples in which exposure was measured (samples 1, 2 and 3). For exposure to *life threat*, the correlations were for no life threat in sample 2: 0.97 (95% CI = 0.96–0.97), and for life threat: 0.94 (95% CI = 0.92–0.95). And in sample 3, the correlations were for no life threat: 0.94 (95% CI = 0.89–0.96), and for life threat: 0.95 (95% CI = 0.91–0.97). *Traumatic loss* was measured in sample 2, and the correlations were for no traumatic loss: 0.97 (95% CI = 0.96–0.97), and for traumatic loss: 0.95 (95% CI = 0.91–0.97). Witnessing experiences were measured in sample 1, and the correlations were for low exposure: 0.90 (95% CI = 0.86–0.93), and for high exposure: 0.94 (95% CI = 0.93–0.96).

Correlations between the IES-6 intrusion, avoidance and hyperarousal subscales and those of the IES-R ranged from 0.78 to 0.94 in samples 1–4 (Table 3).

Comparing proximate diagnostic performance of the IES-6 with the IES-R against the PCL-S (sample 2b)

Table 4 shows the sensitivity, specificity, negative and positive predictive values, and overall efficiency for the IES-6 and the IES-R in sample 2b.

The area under curve (AUC) for the IES-6 and the IES-R was virtually identical (0.95 (95% CI: 0.94–0.96) for the

IES-6 compared with 0.95 (95% CI: 0.94–0.97) for IES-R with a PCL cutoff level of 32. The corresponding AUC figures using a PCL cutoff of 40 were 0.96 (95% CI: 0.95–0.97) for the IES-6 and 0.97 (95% CI: 0.96–0.98) for IES-R).

Discussion

This study has developed an abbreviated form of the IES-R (the IES-6) that explains most of the variance of the IES-R in four different samples of individuals exposed to a potentially traumatic event. The sum score of the IES-6 correlated highly (pooled correlation = 0.95) with the IES-R sum score in all four samples. Previous studies have indicated that participant characteristics, such as gender, age, and recent life experiences, may affect responses to items [33]. The IES-6, however, correlated highly with the IES-R across gender, age and across type of trauma and trauma severity in the three samples in which this was measured.

The correlations between the IES-6 and IES-R subscales of intrusion, avoidance and hyperarousal were somewhat lower, but still within an acceptable range ($r = 0.78–0.94$).

There were no observable differences between the performance of the IES-6 and IES-R when using the PCL, with a cutoff of 32 as a proximate measure of PTSD. Both the IES-6 and IES-R were in high agreement with the PCL. Using a stricter cutoff of 40 on the PCL resulted in a marginally preferential outcome for the IES-R.

Weighting of items in the IES-6 did not increase the correlation with the IES-R, indicating that the IES-6 might be used as an unweighted sum score. Further, the correlations between the IES-6 and IES-R were high both in samples 1 and 3, using the original IES response format (frequency of symptoms), and in samples 2 and 4, using the IES-revised response format (severity of symptoms). The IES-6, then, seemed to be robust across response formats.

Table 2 Correlations (r) Between IES-6 and IES-R, and 95% confidence intervals of r in the four samples and subsamples

| Subsample | Sample 1 | | Sample 2a | | Sample 3 | | Sample 4 | |
|--------------|----------|------------------|-----------|------------------|----------|------------------|----------|------------------|
| | N | r (95% CI) | N | r (95% CI) | N | r (95% CI) | N | r (95% CI) |
| Total sample | 595 | 0.96 (0.95–0.96) | 860 | 0.97 (0.96–0.97) | 143 | 0.94 (0.91–0.95) | 116 | 0.93 (0.89–0.95) |
| Gender | | | | | | | | |
| Men | 352 | 0.96 (0.95–0.96) | 406 | 0.98 (0.97–0.98) | 114 | 0.94 (0.91–0.96) | 56 | 0.91 (0.86–0.95) |
| Women | 240 | 0.95 (0.94–0.96) | 454 | 0.96 (0.95–0.96) | 29 | 0.90 (0.80–0.95) | 59 | 0.94 (0.90–0.96) |
| Age group | | | | | | | | |
| 1 | 232 | 0.95 (0.94–0.96) | 342 | 0.96 (0.95–0.97) | 89 | 0.94 (0.90–0.96) | 83 | 0.94 (0.90–0.96) |
| 2 | 176 | 0.95 (0.93–0.96) | 269 | 0.97 (0.97–0.98) | 54 | 0.94 (0.89–0.96) | 32 | 0.92 (0.83–0.96) |
| 3 | 183 | 0.97 (0.96–0.98) | 249 | 0.97 (0.96–0.98) | – | – | – | – |

All correlations presented: $P < 0.001$

Table 3 Correlations (r) and 95% confidence intervals (95% CI) of r between IES-6 subscales and IES-R subscales

| Subscale | Sample 1 ($N = 604$) r (95% CI) | Sample 2a ($N = 860$) r (95% CI) | Sample 3 ($N = 143$) r (95% CI) | Sample 4 ($N = 116$) r (95% CI) |
|--------------|--|---|--|--|
| Intrusion | 0.90 (0.88–0.91) | 0.93 (0.92–0.94) | 0.89 (0.85–0.92) | 0.85 (0.79–0.89) |
| Avoidance | 0.88 (0.86–0.89) | 0.90 (0.89–0.91) | 0.83 (0.77–0.88) | 0.78 (0.69–0.84) |
| Hyperarousal | 0.91 (0.89–0.92) | 0.94 (0.93–0.95) | 0.88 (0.84–0.91) | 0.88 (0.83–0.92) |

All correlations presented: $P < 0.001$

Table 4 Sensitivity and specificity, positive and negative predictive value, and overall efficiency of the IES-6 and IES-R with PTSD checklist (cutoff ≥ 32) as the reference measure of PTSD

| Instrument | Cutoff level | Sensitivity | Specificity | Positive predictive value | Negative predictive value | Overall efficiency |
|------------|--------------|-------------|-------------|---------------------------|---------------------------|--------------------|
| IES-6 | 7 | 0.96 | 0.74 | 0.62 | 0.98 | 0.84 |
| | 8 | 0.92 | 0.84 | 0.66 | 0.97 | 0.86 |
| | 9 | 0.86 | 0.88 | 0.71 | 0.95 | 0.87 |
| | 10 | 0.80 | 0.92 | 0.77 | 0.93 | 0.89 |
| | 11 | 0.72 | 0.94 | 0.81 | 0.90 | 0.88 |
| | 12 | 0.62 | 0.97 | 0.88 | 0.88 | 0.88 |
| | 13 | 0.55 | 0.99 | 0.94 | 0.86 | 0.87 |
| IES-R | 23 | 0.95 | 0.78 | 0.61 | 0.98 | 0.83 |
| | 27 | 0.91 | 0.87 | 0.71 | 0.96 | 0.88 |
| | 31 | 0.81 | 0.91 | 0.76 | 0.93 | 0.88 |
| | 35 | 0.72 | 0.94 | 0.81 | 0.90 | 0.88 |
| | 39 | 0.61 | 0.98 | 0.90 | 0.88 | 0.88 |
| | 43 | 0.50 | 0.99 | 0.94 | 0.85 | 0.86 |
| | 47 | 0.41 | 0.99 | 0.98 | 0.83 | 0.84 |

In line with previous research [16, 19, 20], our results indicate that short scales perform as well as longer scales. Short scales have the advantages of reducing costs and reducing the burden on respondents. In our opinion, the IES-6 has some advantages compared to the other abbreviated PTSD measures. The IES-6 is shorter than the TSQ [20]. The TSQ has a yes/no response format, resulting in less information about symptom severity. Brewin and colleagues argued that a yes/no response format simplified matters for respondents, but we are not convinced that this is the case. Previous research has found that informants may show a preference for gradated response formats [34, 35]. Compared to the SPAN, and the abbreviated versions of PCL, the IES-6 was tested in a wider variety of trauma populations. The IES-6 also captures the three current symptom clusters of the PTSD diagnosis, which none of the other short scales do.

The IES has been criticized for not strictly following the diagnostic criteria of the DSM-IV PTSD diagnosis [36]. Nevertheless, the IES has been found superior to most other scales as a screen for PTSD [7] and, as it is one of the most widely used measures of PTSD, the instrument is already familiar to researchers and clinicians. The IES-6

might easily be further validated by re-analyses of already existing data using the IES-R.

Limitations

The PCL was used as a proximate measure of PTSD. A structured clinical interview is considered the gold standard for identifying the presence or absence of PTSD. Because structured interview data were not available in this study, we could not directly evaluate the diagnostic efficiency of the IES-6. The cutoff levels should therefore be interpreted with caution. The use of another psychometric self-report instrument to determine the presence of PTSD, as opposed to structured interviews, may have resulted in an overestimation of the sensitivity and specificity for the IES-R and IES-6 alike. However, the relative performances of the full- and the short-form instruments are unlikely to be seriously biased by the absence of structured interview data.

There is a current debate about the PTSD diagnosis and its symptom clusters. At present, the PTSD diagnosis includes three symptoms clusters (reexperiencing, avoidance/numbing and hyperarousal). In a recent review, Asmundson and colleagues [37] concluded that the empirical

evidence seems to favor a four factor solution, in which avoidance and numbing are distinct symptom clusters. In the present study, the subscales investigated only represented the three symptoms clusters currently included in the PTSD diagnosis.

The IES-6 was administered as part of the 22-item IES-R. It is not known if subjects would respond differently if asked to answer six questions only.

The low response rates in some of the samples in this study may reflect selection bias. It is unlikely that such bias would affect the associations between the IES-6 and IES-R. However, a potential biased estimate of the PTSD prevalence as measured by the PCL may have affected the observed cutoff levels, both for the IES-R and IES-6. Caution should be taken when generalizing cutoff levels across samples, both for comprehensive and short screening instruments.

The study involved Norwegian populations and a Norwegian version of the IES-R. The Norwegian IES-R has been backtranslated, but the results are not yet published. However, sample 4 was an English speaking population using the English version of the IES-R and produced similar results. In common with all abbreviated scales the IES-6 cannot provide a clinical diagnosis, but this is not the purpose of such measures, which primarily aim to identify those with significant traumatic stress symptoms who would require further assessment to determine if they fulfill the full criteria for a diagnosis of PTSD.

Strengths

The abbreviation of the IES-R was performed in one sample, and then replicated in three independent samples. The sample sizes, different populations, different types of trauma exposure, the inclusion of a clinical sample and the high and stable correlations across age, gender, type, and degree of traumatisation are all strengths of the study.

The IES-6 appears to perform well as a brief measure of posttraumatic stress reactions in clinical and nonclinical populations. It will probably prove useful in research when questionnaire space restrictions do not allow for comprehensive instruments, for example in large epidemiological studies that do not have traumatic stress and stress reactions as their main focus of investigation. It may also have a role as a screening instrument in clinical practice.

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Conflict of interest statement None.

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