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Brief report

Achieving convergence between a community-based measure of explosive anger and a clinical interview for intermittent explosive disorder in Timor-Leste

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ABSTRACT

Background: There is growing research interest in understanding and analyzing explosive forms of anger. General epidemiological studies have focused on the DSM-IV category of Intermittent Explosive Disorder (IED), while refugee and post-conflict research have used culturally-based indices of explosive anger. The aim of this study was to test the convergence of a culturally-sensitive community measure of explosive anger with a structured clinical interview diagnosis of IED in Timor-Leste, a country with a history of significant mass violence and displacement.
Methods: A double-blind clinical concordance study was conducted amongst a stratified community sample in post-conflict Timor-Leste ($n=85$) to compare a community measure of anger against the Structured Clinical Interview (SCID) module for IED.
Results: Clinical concordance between the two measures was high: the area under the curve (AUC) index was 0.90 (95% CI: 0.83–0.98); sensitivity and specificity were 93.3% and 87.5% respectively.
Limitations: Response rates were modest due to the participant's time commitments.
Conclusions: It is possible to achieve convergence between culturally-sensitive measures of explosive anger and the DSM-IV construct of IED, allowing comparison of findings across settings and populations.
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1. Introduction

Pathological forms of anger have attracted increasing mental health research attention in recent years (Fava et al., 1990), with national epidemiological studies in the United States and Japan documenting the prevalence and correlates of the DSM-IV category of Intermittent Explosive Disorder (IED) (Kessler et al., 2006; Yoshimasu et al., 2011). In parallel, research in post-conflict settings has investigated the association between the traumas of mass violence and explosive forms of anger. This has led to the development of measures of anger adapted to the cultural and sociopolitical context of target populations (Hinton et al., 2009; Silove et al., 2009). In order to draw comparisons across the whole body of research on anger, there is a need to examine the level of convergence of culture-based measures of anger and clinically-defined IED.

To our knowledge, a study in South Africa is the only investigation that has assessed IED prevalence (9.5%) in a country that has undergone major political upheaval in recent decades (Fincham et al., 2009). We have developed and applied a brief measure of explosive anger in an epidemiological survey in Timor-Leste in 2004. Timor-Leste is a half-island country situated north of Australia between Papua New Guinea and Indonesia. Its occupation by Indonesia from 1975–1999 was a period characterized by wide-spread political repression, intimidation, mass violence, killings, disappearances and torture (CAVR, 2005). In 1999, Indonesia withdrew after the Timorese voted for independence in an UN supported referendum, but only following a post-election humanitarian crisis that included widespread atrocities, mass displacement and destruction of infrastructure (Silove, 1999). Since Timor-Leste was established as an independent nation in 2002, ongoing periods of internal conflict and instability have occurred, most notably in 2006, and the country continues to face major socio-economic and development challenges.

We used ethnographic and qualitative methods to adapt the contemporary definition of anger attacks (Fava et al., 1990; Fava et al., 1991) to the cultural and linguistic setting in Timor-Leste (Silove et al., 2009). Anger attacks had earlier been identified by Timorese community informants as being prevalent and highly

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disruptive to the community (Brooks et al., 2011). The 2004 survey found that explosive anger was prevalent (38%), a rate substantially higher than that observed for PTSD (7%) and an index of general distress (5.4%) (Silove et al., 2008; Silove et al., 2009), suggesting that extreme anger is not simply a component of other post-traumatic disorders. The prevalence of anger attacks also appeared to be higher than the rates of more strictly defined IED assessed in countries such as the USA (7.3%) (Kessler et al., 2006) and Japan (2.1%) (Yoshimasu et al., 2011), but differences in definition and measurement have precluded direct comparison across countries. Therefore, in order to facilitate meaningful cross-national comparisons, it was important to attempt to reconcile culturally-based assessments of explosive anger with the DSM-IV criteria of IED.

Since the baseline study in 2004, we have implemented a series of modifications to the community measure of anger to align the index with DSM-IV diagnostic criteria for IED, while maintaining its cultural and linguistic sensitivity. This updated community measure has been used in a 6-year follow-up study of our 2004 baseline survey in 2010–2011. The aim of the present analysis was to test the level of convergence of the community measure of explosive anger with a structured clinical interview diagnosis of IED in Timor-Leste.

2. Methods

2.1. Measures

2.1.1. Community-based anger measure

The 2004 survey assessed the prevalence of episodes of explosive anger or anger attacks using an item expressed in the indigenous language of Tetum: "*Karik iha tempo nebe ita sente mosu hirus derepente*?" which translates to: "Do you have sudden attacks of anger?". Also included were questions concerning the frequency of the anger episodes (Silove et al., 2009). Following the 2004 survey, we extended the pool of items to incorporate indicators of anger expression and associated levels of social and functional impairment. To develop these items, a series of ethnographic field tests were conducted over a period of several months in locations geographically separated from the main community survey. The focus was on, (1) extending anger items to develop an expanded measure capturing the nature and significance of anger and aggression in Timorese communities, while also aligning the overall measure with the DSM-IV criteria for IED; (2) ensuring accuracy of comprehension in Tetum of anger items, given that Tetum contains a limited array of terms for emotional disturbances such as anger; and (3) enabling participants to make candid verbal responses that reflected their anger experiences given literacy rates are low in Timor-Leste. Item and language modifications were made iteratively in a feedback loop based on field testing, and by consultation amongst the Australian and Timorese research team.

The key domains of the final modified community anger measure were, descriptors of anger attacks; triggers and the contextual inappropriateness of anger attacks; the level of controllability of anger; frequency of attacks; manifestations of aggressive behavior (verbal, against property, and interpersonal); physiological manifestations of anger; and level of associated psychosocial impairment. The Tetum version of the community measure was back-translated into English according to standard practice (Bracken and Barona, 1991), and analyzed for consistency with the DSM-IV construct of IED. Field testing guided the selection of a visual analog scale consisting of 7 circles that increased progressively in size and darker shades of gray to indicate gradations in severity for each symptom. An algorithm

Table 1
IED DSM-IV criteria aligned with associated items from community anger measure items included in the IED scoring algorithm.

	IED DSM-IV criteria	Community anger Measure items[a]	Cut-off accepted for presence of symptom[b]
A	Several discrete episodes of failure to resist aggressive doller06#impulses that result in serious assaultive acts or doller06#destruction of property	**A1. Presence of anger attacks:** do you have sudden episodes doller06#or attacks of anger? And…	Present
		A2. Presence of aggressive behavior: exhibit one type of doller06#aggressive behavior to a significant degree	*Circle 1 (Never)–Circle 7 (every time I get angry)*
		How often do you shout/yell? Or…	Circle 4 or above
		How often did you throw or break things? Or…	Circle 2 or above
		How often did you push or hit someone?And…	Circle 3 or above
		A3. Loss of control	*Circle 1 (Never)–Circle 7 (every time I get angry)*
		When you became very angry, how often did doller06#you feel out of control? And…	Circle 4 or above
		A4: Frequency of aggressive anger attacks? How often do the attacks occur?	Once a month or more
B	The degree of aggressiveness expressed during the doller06#episodes is grossly out of proportion to any precipitating psychosocial stressors	**B1. Anger attacks out of proportion to trigger** Over the past month, have small things that have happened doller06#to you in your daily life triggered these attacks? Or	Present
		B2. Anger attacks perceived as excessive Do you have anger attacks that seem excessive to yourself or other people?	Present
C	The aggressive behavior is not better accounted for by another mental disorder, and is not due to the direct physiological doller06#effects of a substance or a general medical condition C1. doller06#Anger attacks not due to alcohol or drug intake?	**C1. Anger attacks not due to alcohol or drug intake?**	*Circle 1 (Never)–Circle 7 (every time I get angry)*
		You have indicated that you sometimes shout/yell, throw/break or push/hit someone. When this happens how often are you drinking or using drugs?	Circle 1 only

[a] The items are presented in simplified form in English translation from Tetum. The original items include additional description consistent with structure of the Tetum language. The Tetum translations are available upon request.
[b] Cut-off thresholds were determined by median scores in the 2010-2011 survey (excluding respondents who did not endorse presence of anger attacks).

was developed to score the relevant anger items in order to yield a provisional diagnosis of IED according to DSM-IV criteria (summarized in Table 1).

The community survey also applied the Harvard Trauma Questionnaire (Mollica et al., 1992) to identify post-traumatic stress disorder (PTSD) symptoms. The K10 (Kessler et al., 2002), supplemented with additional items, was used to derive a major depressive episode (MDE) diagnosis based on DSM-IV criteria.

2.1.2. Clinical interview for IED

The clinical interview for IED was based on the Structured Clinical Interview (SCID) module for DSM-IV impulse control disorders (First, 2008). The SCID is a semi-structured interview administered by trained mental health professionals and is widely regarded as a gold-standard for diagnosing DSM-IV disorders. We supplemented the interview with items from the Composite International Diagnostic Interview (CIDI) IED module (Kessler et al., 2006), which provides a more detailed range of descriptors for IED (full list of questions available on request). SCID modules for PTSD and major depressive episode (MDE) were also administered (First et al., 1997) and the indices of convergence with the relevant questionnaire measures will be reported elsewhere.

2.2. Participants

The 2010 survey comprised the total adult population (> 3000 persons, 90.4% response rate) of an urban and rural site in Timor-Leste (Silove et al., 2008). The details and results of the full study will be reported elsewhere. The present concordance study was conducted in June–July 2011 at the conclusion of the main survey. Ethical clearance was provided by the University of New South Wales Human Research Ethics Committee, Australia.

In order to obtain an enriched sample to allow testing for concordance (Haro et al., 2006), we extracted a stratified subsample from the 2010 survey database including provisional IED cases ($n=50$); and provisional non-cases ($n=50$) for potential recruitment to the concordance study. Provisional IED cases were defined as meeting IED criteria according to the scoring algorithm presented in Table 1; provisional non-cases were defined as not meeting the DSM-IV definition for IED, PTSD or MDE. A power analysis indicated that a sample size of at least 25 cases across all diagnoses and 25 non-cases would provide sufficient power to detect a high level of concordance based on the area under the curve (AUC) index.

2.3. Procedure

Trained non-professional Timorese field staff with extensive interviewing experience from the 2010 survey first administered a brief screen for current anger attacks at the homes of individual participants included in the stratified subsample. This was to take into account the possibility of a change in anger status since the main survey. Participants who met inclusion criteria were transported to the survey offices in Dili and informed consent was elicited. Following a double-blind procedure, trained Timorese mental health interviewers first administered the full community anger measure in the Tetum language. After a short break, the SCID IED module was then administered by 2 Australian psychologists experienced in transcultural and post-conflict mental health research and clinical work, supported by competent translators. In preparation for the study, the Australian psychologists achieved 100% inter-rater reliability in applying the SCID IED interview. All interviewers were blind to the results of all previous interviews.

2.3.1. Differences between implementation of the community anger measure and SCID IED module

The community anger measure differed from the SCID IED module in its implementation in three key ways: (1) Translation: the Tetum items developed for the community anger measure were adapted by iterative field testing to ensure that the most accurate local idioms were used; whereas translation of SCID items and additional questions was conducted *in vivo* during the interview, according to the exchange between the clinically trained interviewer and participant, aided by experienced interpreters; (2) Administration: the community anger measure was administered by non-professional Timorese field workers who had been trained and supervised by an Australian researcher; the SCID was applied by western-trained professionals; and (3) Mode of response: the community anger measure elicited self-report responses within a forced-choice and structured format (using variously a visual analog scale described above or dichotomous response format—refer to Table 1); whereas the SCID utilized open-ended questions that allowed the clinician to probe in order to verify the presence, nature and strength of symptoms.

2.4. Data analysis and statistics

A provisional diagnosis of IED was determined from the relevant community anger measure items via the application of the scoring algorithm outlined in Table 1; IED was diagnosed from the SCID according to established DSM-IV criteria (First, 2008). The area under the curve (AUC) index yielded by a receiver operating characteristic (ROC) analysis was used to test the level of convergence of the community measure and the SCID in diagnosing IED (Kessler et al., 2004). Other indices included positive and negative predictive power (PPP/NPP), sensitivity, specificity and the overall rate of correct classification. Statistical analyses were conducted using psychometric algorithms based on Streiner (2003) and SPSS (version 18.0).

3. Results

3.1. Recruitment and response rates

Ninety seven participants from a pool of 189 respondents were approached and agreed to participate (response rate 51.4%; provisional IED case response rate 55%; provisional non-case response rate 45%). Following completion of both interviews, a total of 50 participants met the IED diagnostic threshold on either the community measure, SCID, or both (see below for concordance results). Twelve of those selected from the database as provisional non-cases were found at follow-up to meet criteria for PTSD or MDE and were excluded from the present analysis, yielding a sample of 35 non-cases (defined as not meeting diagnostic criteria for IED, PTSD or MDE). Therefore, a total of 85 participants were assessed for IED concordance. Fifty-nine participants (69%) were women, and the mean age was 38.6 years (SD 13.02), with no sex ($\chi 2\ (1)=0.02$, $p>0.05$) or age ($t(83)=1.171$, $p>0.05$) differences between cases of IED and non-cases.

3.2. Indices of concordance

Forty two participants were assigned to the IED category by both the community anger and SCID IED assessments, with a further 8 participants being classified as cases according to one measure alone (Table 2). The ROC analysis produced an AUC of 0.90 (95% CI: 0.83–0.98); a sensitivity of 93.3%; a specificity of 87.5%; a positive predictive power of 0.89 and negative predictive power of 0.92. The overall correct classification was 90.6%. Of the 8 discordant cases, 3 were positively identified by the SCID alone and 5 by the

Table 2
Concordance matrix.

		Clinical SCID interview	
		Positive IED diagnosis	Negative IED diagnosis
Community anger interview	Positive IED diagnosis	42	5
	Negative IED diagnosis	3	35

Presents convergence of cases/non-case numbers (totaling $n=85$) across both the community anger measure and clinical SCID interview, with positive and negative diagnoses as indicated.

community measure alone, suggesting that there was no clear tendency for one measure to detect a higher number of cases.

4. Discussion

The transcultural mental health field continues to confront the challenge of reconciling cultural constructs of mental disorder with international diagnostic categories and their measurement (Van Ommeren, 2003). Given the early stage of the field in developing consensus around the criteria for measuring pathological forms of anger such as IED (Coccaro, 2012; Kessler et al., 2006; McCloskey et al., 2006), our results are notable insofar as they yielded a high level of concordance between the lay administered community measure of IED and the corresponding SCID module administered by trained clinicians with transcultural experience. The findings therefore offer some support for the cross-cultural validity of IED as a diagnostic category when symptoms are measured in a culturally-sensitive manner.

Limitations of the study need to be considered, including the time lapse (2–14 months) between the main mental health survey and convergence study, a constraint that is commonly encountered in inquiries of this type (Haro et al., 2006). To address this issue, we repeated the community interview on the same day as the clinical interview. We also note the modest response rate; the majority of non-respondents were prevented from participating due to work commitments. We are unable to determine whether the response rate resulted in any bias in the findings, but we note that the primary aim of testing concordance is less vulnerable to selection bias than other forms of analysis that require community sample representativeness. The constraints of time and the added burden on respondents meant that it was not possible to fully assess for all exclusionary diagnoses as required by the C criterion of IED (such as personality disorders). We note however that previous studies did not find that screening for other disorders appreciably altered the final prevalence rates of IED at the community level (Kessler et al., 2006). We also note that the criteria for IED are in flux with further changes being introduced in DSM-5 (Coccaro, 2012), a development that will require an update of our measure.

This study supports the feasibility of adapting culturally-sensitive measures of anger and IED for use by locally trained field staff in a low-income, post-conflict country that is culturally distinct from western societies. This approach enables the prevalence of IED to be assessed at a population level and for clinical purposes at an individual level, specifically to identify those who may benefit from interventions. The data will allow refinement of methodologies examining the characteristics and consequences of anger attacks in Timor-Leste (Brooks et al., 2011; Silove et al., 2009), and allow a closer comparison of the Timorese data with IED studies conducted in other settings (Fincham et al., 2009). An important overall focus of our program of study is to assess whether a combination of past human rights trauma and ongoing experiences of adversity contribute to the prevalence of IED. The ultimate aim is to examine whether in these unstable settings, extreme forms of anger contribute to subsequent risk of future violence at both family and community levels (Silove et al., 2009).

5. Conclusions

The focus on explosive forms of anger in post-conflict societies such as Timor-Leste expands the scope of research on mental health outcomes in these settings beyond the current confines of assessing PTSD and depression (Silove and Byrant, 2006). The findings suggest that it is possible to develop a culturally and linguistically appropriate measure of IED in a setting where literacy is low and the indigenous language has a limited lexicon for emotional terms. The results also underscore the value of studying IED at an international level, particularly in communities exposed to cumulative trauma (Silove et al., 2009), in which the risk of future violence remains high.

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Conflict of interest
No conflict declared.

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