

## Cultural Specificity of Emotional Overinvolvement: A Systematic Review

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**Understanding cross-cultural aspects of emotional overinvolvement (EOI) on psychosis outcomes is important for ensuring cultural appropriateness of family interventions. This systematic review explores whether EOI has similar impact in different cultural groups and whether the same norms can be used to measure EOI across cultures. Thirty-four studies were found that have investigated the impact of EOI on outcomes across cultures or culturally adapted EOI measures. The relationship between high EOI and poor outcome is inconsistent across cultures. Attempts to improve predictive ability by post hoc adjustment of EOI norms have had varied success. Few studies have attempted a priori adaptations or development of culture-specific norms. Methodological differences such as use of different expressed emotions (EE) measures and varying definitions of relapse across studies may explain a lack of EOI outcome relationship across cultures. However, our findings suggest that the construct and measurement of EOI itself are culture-specific. EOI may not necessarily be detrimental in all cultures. The effect of high EOI may be moderated by the unexplored dimension of warmth and high levels of mutual interdependence in kin relationships. Researchers should reevaluate the prevailing concepts of the impact of family relations on the course and outcome of psychotic disorders, specifically focusing on the protective aspects of family involvement. Clinically, family interventions based on EE reduction should take cultural differences into account when treating families from different ethnocultural groups.**

*Key words:* expressed emotions/schizophrenia/emotional overinvolvement/cross-cultural research/outcomes/family interventions

### Introduction

Considerable research has focused on identifying factors that increase relapse in psychotic disorders. One such factor is expressed emotions (EE), a complex construct

designed to capture the “emotional climate” within a family. High levels of EE robustly predict higher relapse rates: a meta-analysis found that across 27 studies, the mean effect size of the EE-relapse relationship was  $r = .31$ .<sup>1</sup> Based on such evidence, family intervention programmes to reduce high EE have been developed and shown to reduce relapse.<sup>2</sup> Most studies measure EE using the Camberwell Family Interview (CFI),<sup>3</sup> a detailed semi-structured interview conducted with the patient’s closest relative(s). Relatives’ comments and behavior are rated along 5 dimensions: criticism, hostility, emotional overinvolvement (EOI), warmth, and positive remarks. A global dichotomous EE index is derived from 3 dimensions: those with any hostility, 6 or more critical comments (CC), or a score of 3 or more on EOI are classified as high EE; families who do not meet these thresholds are classified as low EE.<sup>4</sup> Some studies have used other measures of EE, such as the 5-minute speech sample (FMSS)<sup>5</sup> and the level of expressed emotion (LEE) scale.<sup>6</sup> Although the bulk of research has been on relationship between “global” EE scores and relapse, studies have also explored the relationship between individual EE indices such as EOI and outcome.

EOI is defined as intrusive, overprotective, excessively self-sacrificing, or devoted behavior or exaggerated emotional response to the patient’s illness.<sup>7,8</sup> High EOI is related to self-blaming attribution and controlling behaviors in carers<sup>9</sup> and to higher levels of face-to-face contact between carers and patients.<sup>7</sup> There is also correlation between family EOI and depression, anxiety, and residual symptoms in patients.<sup>10,11</sup> Like global EE scores, higher EOI also predicts worse outcomes, both in patients with psychosis and their carers. In carers, high EOI predicts greater objective burden and worse health,<sup>12</sup> and in patients, high EOI predicts both relapse and rehospitalisation.<sup>13</sup>

Jenkins<sup>14</sup> considers EOI to be a “destructive force among kin and a failure to preserve culturally appropriate boundaries among self-systems.”<sup>(p217)</sup> By definition,

therefore, EOI should vary across cultures. The observations that inspired the initial EE research, the EE validation studies, and the CFI development all took place within the United Kingdom.<sup>3,4,7,15,16</sup> The types of behaviors seen as pathological, as well as the thresholds on the CFI scales were defined within the UK cultural context: for instance, relatives were considered low in EOI if they respected the patient's need for social distance and had an "easygoing" approach to the illness.<sup>8</sup> UK norms have therefore been used in the bulk of EOI research. Therefore, any differences found in the prevalence and impact of EOI in non-UK settings could merely be an artifact of a culturally inappropriate operationalizing of EOI in that cultural context.<sup>17</sup>

Cross-cultural research into EE does reveal variation across cultures.<sup>18</sup> EE rates are higher in Western than Eastern/collectivist cultures (rural India: 8%; Mexican Americans: 37%–39%; UK: 45%; and Anglo-Americans: 67%).<sup>3,17,19</sup> In Pakistan, more families are rated as high EOI (53%)<sup>20</sup> as compared with the United Kingdom (21%) or India (0%).<sup>3,19</sup> Hashemi<sup>21</sup> found that British Pakistanis had a modal score of 4 on the EOI scale compared with 1 for white British and British Sikh groups.

This therefore raises some important questions: are the construct, assessment, and impact of EOI culture-specific? If so, should EOI be specifically tailored for cultural differences? How should culture-specific norms be derived? These questions need to be addressed so that families from minority ethnic groups receive interventions that are culturally appropriate and clinically meaningful. To explore the cultural specificity of EOI, we conducted a systematic review that aimed to answer 2 questions:

Does EOI have the same impact on psychosis outcomes across different cultures?

Can the same scale/norms be applied for measuring EOI across different cultural groups?

### Method

A systematic review was performed to identify studies that (1) investigated the relationship between EOI and outcomes in psychosis and/or (2) reported on adjusting or adapting EOI scales and norms to suit a specific cultural context. The following databases were searched: PsycInfo; Embase; OVID Medline (R); HMIC, Health Management Information Consortium; AMED, Allied and Complementary Medicine; CINAHL, Cumulative Index to Nursing and Allied Health Literature, Web of Knowledge; and MEDLINE. Search keywords, divided into groups, included: (1) "expressed emotion\*," "emotional\* overinvolve\*," "emotional\* involve\*," "CFI"; (2) "famil\*," "carer\*," "relative\*"; (3) cultural terms: "cultur\*," "cross-cultural," "non-Western," "ethnic\*," "minorit\*"; (4) "schizophreni\*," "psychos\*," "psychotic," "severe mental health," "psychiatric"; and (5) "outcome\*," "relapse\*," "predict\*," "course," "conse-

quence\*," and "prognos\*." Terms from different groups were combined to form search strings. MeSH terms, where available, were combined and explored. Citations from identified studies and review articles were scrutinized to identify any other relevant studies.

### Inclusion and Exclusion Criteria

Inclusion criteria were that the study provided data on EE and established psychosis or schizophrenia, was allied with the aims in question, and was published in English. Studies were excluded if these were of prodromal psychosis, bipolar disorders, or nonpsychotic conditions; did not report on the impact of EOI on a longitudinal outcome or on cultural adaptation of EOI; were only about caregiver outcomes or staff-patient relationships; or were unpublished reports, reviews, and nondata articles.

### Selection of Studies for Inclusion

The titles of all studies identified were assessed on the inclusion and exclusion criteria and abstracts read (K.H.). For all relevant abstracts, full articles were read to assess whether they met the inclusion criteria. A random selection of abstracts and full articles were crosschecked between K.H. and S.S. to ensure interrater reliability; our rating was good with 100% agreement.

### Data Extraction

Pre-designed tables were used to extract data on (1) the predictive relationships between EOI and outcomes and (2) adjustment of scales and norms to measure EOI. Data on demographic and social factors were extracted if these were reported as mediating between EOI scores and outcome. The methodological heterogeneity of design, measures, and outcomes across studies precluded a meta-analysis; where relevant and obtainable methodological details are reported to highlight these differences. The findings are presented both in table form and as a narrative summary.

### Results

Electronic search generated 823 references of which 34 were selected for final data extraction. Figure 1 describes the process of study identification and inclusion. Six full-text articles could not be located despite extensive searches and contacting authors.

### Study Details

All studies were hypothesis driven but most did not include power calculations or effect sizes. Twenty-eight studies were used for answering objectives 1 and 13 for objective 2. Studies varied in whether these defined a cultural group, a nationality, an ethnic group, or a race. Studies are grouped geographically: European, North American, Australian, and Asian, and where possible, specific cultural or ethnic groups are described.

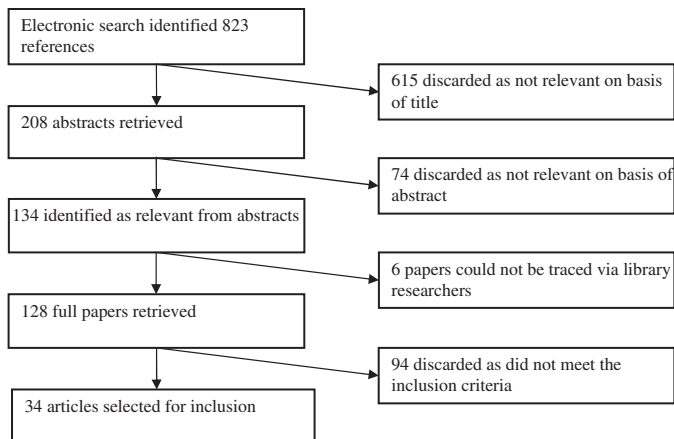


Fig. 1. Flow diagram of study selection process.

### Objective 1: Does EOI Have the Same Impact on Psychosis Outcomes Across Different Cultures?

(table 1) All studies ( $n = 28$ ) were longitudinal and included prospective data on the impact of EOI on some clinical outcome within a specified cultural context. Sample sizes varied from 28 to 108 patients (mean = 66.9 SD = 24.4). Half the cohorts ( $n = 15$ , 53%) were recruited from inpatient units, about a third ( $n = 8$ , 29%) from outpatient facilities, and the remaining ( $n = 5$ , 18%) were a mixture of the 2. For measuring EOI, 19 (68%) studies used CFI, 5 (18%) used the FMSS, 2 (7%) used an interactive problem-solving task, 1 (3%) study used the Munster Family Interview, and the remaining study was the original EE study which used a series of scales for measuring emotional involvement. Fifteen studies (54%) used EOI as a dichotomous variable and 8 (29%) as continuous; 2 (7%) did not specify and 1 (3%) tested both types of data. In 12 studies (43%), 1 relative was interviewed. In 1 study, this was the mother; in 5 studies, any relative living or in significant contact with the patient; and in 6 studies, the relative who had the most contact, known as the key relative. The remaining studies ( $n = 16$ , 57%) interviewed multiple household members. Studies differed in whether the analyses used the score of the member with highest EOI score ( $n = 10$ ), each family member ( $n = 2$ ), the member with most contact ( $n = 1$ ), or averaged scores across all family members ( $n = 1$ ). Two studies that interviewed multiple household members did not specify whose EE scores were used in the analyses. Outcomes included relapse risk ( $n = 20$ , 71%), measures of psychopathology ( $n = 6$ , 21%), time to readmission ( $n = 2$ , 7%), readmission risk ( $n = 2$ , 7%), social adjustment ( $n = 2$ , 7%), stabilization ( $n = 1$ , 3%), psychosocial skills ( $n = 1$ , 3%), symptomatic change ( $n = 1$ , 3%), total months with active psychotic symptoms ( $n = 1$ , 3%), and length of hospital stays ( $n = 1$ , 3%). Follow-up periods ranged from 6 months to 7 years (mean = 16.6 mo, SD = 16.3).

*European Samples.* The relationship between high EOI and psychosis outcomes is inconsistent in European studies. Three studies have found that higher EOI in relatives predicts greater likelihood of relapse.<sup>7,16,27</sup> The original UK study<sup>7</sup> had reported that patients living in high EOI homes had higher rates of relapse 12 months later. A 12-month follow-up had found that high EOI predicted increased rates of relapse 9 months later.<sup>16</sup> Similarly, in a Serbian sample, higher EOI, especially maternal, predicted higher rates of relapse 9 months later.<sup>27</sup> However, 5 other studies, using Swiss-French, Dutch, Italian, and German samples, have found no relationship between EOI and outcomes.<sup>22–26</sup>

*North American Samples.* In a sample of white and black Americans, high EOI predicted increased likelihood of relapse at 1-year follow-up.<sup>28</sup> Similarly, in a group of US Anglo-Americans, high paternal EOI predicted increased likelihood of relapse at 9 months, but maternal EOI did not. However, both parents' high EOI were associated with higher levels of psychotic symptoms at follow-up.<sup>13</sup> In a Canadian sample (87% white), high EOI scores at baseline were associated at trend level ( $P < .1$ ) with more positive symptoms 9 months later.<sup>33</sup> In the same sample, higher EOI in mothers at baseline was associated with relapse at 9 months at trend level but had no relationship at 18 months.<sup>34</sup> Paternal EOI was unrelated to relapse at 9 or 18 months.<sup>34</sup> In another Canadian sample, King<sup>35</sup> found no association between EOI and total, positive, or negative symptoms at 18 months; higher EOI was, however, associated with less hostile uncooperative symptoms at 9 months.

King and Dixon<sup>32,33</sup> also tested the impact of EOI on social adjustment of patients 9 months later in Canadian samples.<sup>33,34</sup> Higher maternal EOI predicted “better” social adjustment in patients to being a household member and to being an external family member. Higher EOI across both parents predicted better social adjustment in patients to being a household member. However, EOI in either carer was not associated with patients' general, work, or leisure social adjustment.

*Comparative Group Studies.* In the United States, 2 studies have compared white and African American families.<sup>30,31</sup> Parental intrusiveness did not predict stabilization in patients 6 months later in either group.<sup>30</sup> However, in African Americans, high levels of intrusiveness predicted “longer” time to relapse.<sup>31</sup> No such effect was found in white Americans; however, an interactive effect was found such that low levels of intrusiveness in the presence of low levels of odd thinking were associated with longer times to relapse in this group. Tompson et al<sup>29</sup> compared white Americans, African Americans, and an “other” group which included Latinos and Asian Americans. Using the FMSS, they found no relationship between baseline EOI and psychotic exacerbation at 1-year follow-up in any group.

**Table 1.** Summary of Studies of the Impact of EOI on Outcomes (Objective 1)

Study	Country	Cultural/Ethnic Groups Included	Sample Size	Predictor	Outcome Measure	Length of Follow-Up	Main Findings
Brown <sup>7</sup>	United Kingdom	Living in London, European only	97 patients; 97 carers	EOI (original EE study—EOI here akin to EE)	Relapse risk	12 mo	High EOI significantly predicted increased likelihood of relapse at follow-up. Relationship held for parents, wives, and more distant kin. Patients who were moderately or severely disturbed in mental state at discharge and who returned to “high emotional involvement” homes deteriorated less frequently when they spent less than 35 h/wk with the key relative.
Brown et al <sup>16</sup>	United Kingdom	UK Born, living in London	101 patients and caregivers	EOI-CFI	Relapse risk	9 mo	High EOI was associated with an increased likelihood of relapse.
Barrelet et al <sup>22</sup>	Switzerland	Living in Geneva, French Speaking	36 patients; 36 caregivers	EOI-CFI	Relapse risk	9 mo	EOI did not predict relapse.
Lenior et al <sup>23</sup>	Netherlands	No detail	75 patients and families (EOI data for 44–54 patients)	EOI-FMSS	Relapse risk	17- to 55-mo follow-up (mean 34 mo)	EOI (for mothers, fathers, or averaged, parent scores) was not associated with relapse at T3, 17–55 mo after discharge (average 34 mo).
Lenior et al <sup>24</sup>	Netherlands	No detail	Same sample as Lenior et al <sup>23</sup>	EOI-FMSS measured pre and post 12-mo intervention	Relapse (total psychotic months)	60-mo post intervention	No association between EOI at T1 (preintervention) or T2 (postintervention) and months of psychotic episodes at 5 y.
Stricker et al <sup>25</sup>	Germany	No detail	94 patients and key relatives	EOI-MFI	Rehospitalization (2 y), symptomatology (1 y), and psychosocial skills (1 y)	1 or 2 y, dependent upon outcome measure	EOI did not predict rehospitalization, extent of symptoms nor psychosocial skills at follow-up. Higher EOI did predict improved psychosocial skills in a subset of moderately ill patients.

Table 1. Continued

Study	Country	Cultural/Ethnic Groups Included	Sample Size	Predictor	Outcome Measure	Length of Follow-Up	Main Findings
Montero et al <sup>26</sup>	Italy	No detail	60 patients and key relatives	EOI-CFI	Relapse risk	9 mo and 2 y	No significant association between EOI and relapse using classical scoring criteria at either follow-up. High EOI significantly predicted increased likelihood of relapse. Maternal EOI was the strongest predictor. High EOI in fathers, but not in mothers, predicted worse overall outcomes. High EOI in both mothers and fathers predicted higher symptomatology at follow-up. Key relatives' (highest scorer in family) EOI was not associated with overall outcome, but higher levels predicted higher symptomatology at follow-up.
Ivanovic et al <sup>27</sup>	Serbia	No detail	60 patients and caregivers	EOI-CFI	Relapse risk	9 mo	High EOI significantly predicted relapse. Neither EOI-FMSS nor patients' perceptions of EOI predicted relapse at follow-up in overall sample. No significant differences between ethnic groups.
Vaughn et al <sup>3</sup>	United States	Anglo-Americans	69 patients and caregivers	EOI-CFI	Combined relapse risk and symptomatology to form an indicator of overall outcome	9 mo	No significant relationships between parental intrusiveness and patient stabilization in whites or African Americans.
Moline et al <sup>28</sup>	United States	67% US Blacks; 33% US Caucasians	24 patients and their families	EOI-CFI	Relapse risk	1 y	High EOI significantly predicted relapse.
Tompson et al <sup>29</sup>	United States	46% African American, 30% Caucasian; 15% Latino, and 9% Asian American	33 patients; 36 relatives	EOI-FMSS and patients' perceptions of EOI	Relapse risk	1 y	Neither EOI-FMSS nor patients' perceptions of EOI predicted relapse at follow-up in overall sample. No significant differences between ethnic groups.
Rosenfarb et al <sup>30</sup>	United States	48% White; 52% African American	58 patients and their parents	Problem-solving task, relatives' intrusive behaviors rated	Stabilization	6 mo	No significant relationships between parental intrusiveness and patient stabilization in whites or African Americans.



**Table 1.** Continued

Study	Country	Cultural/Ethnic Groups Included	Sample Size	Predictor	Outcome Measure	Length of Follow-Up	Main Findings
Rosenfarb et al. <sup>31</sup>	United States	44% White; 56% African American	58 patients and their parents	Problem-solving task, relatives' intrusive behaviors rated	Relapse	2 y	In African Americans, high levels of relatives' intrusive behavior predicted longer time to relapse. Only significant finding in white patients was an interaction: less intrusive behavior in relatives combined with low levels of patients' unusual thinking predicted longer time to relapse. Higher EOI in mothers predicted better social adjustment in patients' to being: a household member and external family member. All other relationships were nonsignificant: EOI was not associated with general social adjustment, work, or social-leisure social adjustment for any caregivers.
King and Dixon <sup>32</sup>	Canada	87% White, 10% Black, and 3% Asian	69 patients, 108 relatives	EOI-CFI	Social adjustment <sup>a</sup>	9 mo	Higher EOI scores averaged across both parents tended to be associated with a preponderance of positive symptoms 9 mo later ( $P = .07$ ). Higher EOI averaged across both parents predicted better social adjustment to: household member role and external family role (trend).
King and Dixon <sup>33</sup>	Canada	87% White, 10% Black, and 3% Asian	Same sample as King and Dixon <sup>32</sup>	EOI-CFI	Social adjustment and positive symptom.	9 mo	Higher EOI scores averaged across both parents tended to be associated with a preponderance of positive symptoms 9 mo later ( $P = .07$ ). Higher EOI averaged across both parents predicted better social adjustment to: household member role and external family role (trend).

Table 1. Continued

Study	Country	Cultural/Ethnic Groups Included	Sample Size	Predictor	Outcome Measure	Length of Follow-Up	Main Findings
King and Dixon <sup>34</sup>	Canada	87% White, 10% Black, and 3% Asian	Same sample as King and Dixon <sup>32</sup>	EOI-CFI	Relapse risk	9 and 18 mo	Trend for higher EOI in mothers to be associated with relapse at 9 mo at 18 mo, no relationship. Fathers' EOI scores were unrelated to relapse at 9 or 18 mo.
King <sup>35</sup>	Canada	43% French Canadian, 35% English Canadian, 14% European, and 7% Caribbean	28 patients and their mothers	EOI-CFI	Symptoms (positive, negative, hostile/uncooperative, and total symptoms)	9 and 18 mo	Higher EOI at baseline associated with less severe hostile uncooperative symptoms 18 mo later. No effects on total symptoms and positive or negative symptoms.
Parker et al <sup>36</sup>	Australia	No detail	57 patients and their parents	EOI-CFI	Relapse risk	9 mo	EOI did not predict relapse.
Vaughan et al <sup>37</sup>	Australia	No detail	91 patients and key relatives	EOI-CFI	Relapse risk	9 mo	EOI did not predict relapse once demographic factors and CC were controlled for.
Breitborde et al <sup>38</sup>	United States	Mexican Americans	44 patients; 44 carers	EOI-CFI (adapted norms)	Relapse risk	9 mo	EOI was related curvilinearly to relapse. A J-shaped curve fitted the data best: relapse risk was lowest for medium EOI and increased at an increasing rate at higher levels of EOI.
Aguilera et al <sup>39</sup>	United States	Mexican Americans	60 patients; 60 carers	EOI-CFI (and Mexican enculturation, US acculturation)	Relapse risk and symptomatology	12 mo	Higher EOI was associated with increased relapse. Relationship remained significant when controlling for other EE indices and medication adherence. No interactive effects of Mexican enculturation or US acculturation on the relationship between EOI and relapse.

Table 1. Continued

Study	Country	Cultural/Ethnic Groups Included	Sample Size	Predictor	Outcome Measure	Length of Follow-Up	Main Findings
Breitbart et al <sup>40</sup>	United States	Mexican Americans	Same sample as Aguilera et al <sup>39</sup>	EOI-CFI	Health status—mental, physical, and general health	13 mo	No significant association between EOI and patients' health at follow-up.
Marom et al <sup>41</sup>	Israel	Jewish. 49.5% African/Asian origin; 50.5% European	108 patients; 151 key relatives	EOI-FMSS	Readmission risk, time to readmission, symptom score	6 mo	EOI was not associated with any of the outcomes tested.
Marom et al <sup>42</sup>	Israel	Jewish, Hebrew Speaking. 49.5% African/Asian origin; 50.5% European	Same sample as Marom et al <sup>42</sup>	EOI-FMSS	Readmission risk, time to 1st and 2nd readmissions, length of hospital stays	7 y	EOI was not associated with any of the outcomes tested.
Leff et al <sup>43</sup>	India	No detail	93 patients; 93 key relatives	EOI-CFI	Relapse risk	1 y	The number of relatives scoring at least 3 on EOI was too few to conduct a meaningful analysis; there was no significant relationship even if cutoff point was lowered.
Leff et al <sup>44</sup>	India	No detail	Same sample as Leff et al <sup>44</sup>	EOI-CFI	Relapse risk	2 y	No relationship between EOI at baseline and relapse at 2-y follow-up.
Ng et al <sup>45</sup>	Hong Kong	Hong Kong-Chinese only	33 patients and their key relatives	EOI-CFI	Relapse risk	9 mo	Relapse was not associated with EOI.
Tanaka et al <sup>46</sup>	Japan	No detail	52 patients and their key family members.	EOI-CFI	Relapse risk	12 mo	Those in the high EOI group had an 80% relapse risk compared to 34% in the low EOI group; the significance levels of this difference were not reported.

Note: EOI, emotional overinvolvement; EOI-CFI, camberwell family interview, emotional overinvolvement subscale; EOI-FMSS, 5-minute speech sample, emotional overinvolvement subscale; MFI, munster family interview; EE, expressed emotion; CC, critical comments.

<sup>a</sup>Measure assesses social adjustment to roles of work, household member, external family member, and social leisure and global score.



*Mexican American Samples.* Three studies have investigated the EOI-relapse relationship in Mexican Americans using different EOI norms. In one sample rated using standard norms, high EOI was associated with an increased risk of relapse at 12 months<sup>39</sup> but did not predict more symptoms at follow-up<sup>39</sup> nor physical, mental, or general health.<sup>40</sup> In another sample where EOI was rated according to “culturally unusual behaviours”<sup>14</sup> (discussed below), Breitborde et al<sup>38</sup> found a curvilinear relationship between EOI scores and relapse, with moderate EOI levels presenting the lowest relapse risk.

*Australian Samples.* In 2 studies, EOI at baseline had no relationship with relapse 9 months later when demographic factors and CC were controlled.<sup>36,37</sup>

*Asian Samples.* In one Japanese study, high EOI predicted increased risk of relapse over 9 months.<sup>46</sup> None of the other 5 studies found a significant relationship between EOI and outcomes.<sup>41–45</sup> In a Hong Kong-Chinese sample, baseline EOI measured using CFI was not associated with relapse 9 months later.<sup>45</sup> In an Israeli sample, baseline EOI measured using the FMSS was not associated with readmission risk, time to readmission, or symptoms at 9 months<sup>41</sup>; not associated with likelihood of readmissions; or with total length of hospital stays during a 7-year follow-up.<sup>42</sup> In an Indian sample, baseline EOI was not associated with relapse at either 1- or 2-year follow-up.<sup>43,44</sup>

Overall, the findings on the relationship between EOI and psychosis outcomes are mixed both within and across different geographical and cultural settings. About an equal number of European and American studies confirm and refute this relationship. In one African American sample, high EOI predicted “longer” time to relapse. Neither Australian study found a significant EOI-relapse relationship. In Asian studies, only 1 of 6 found a significant EOI outcome relationship.

#### *Objective 2: Can the Same Scale or Norms Be Applied for Measuring EOI Across Different Cultural Groups?*

The studies addressing question 2 were also methodologically diverse (table 2). Seven studies (54%) conducted post hoc analyses to assess whether adjustments to the EOI cutoff could improve the predictive ability of global EE. Four (31%) studies conducted post hoc analyses to optimize the discriminative power of EOI score in predicting relapse. Three studies (23%) explored the cross-cultural appropriateness of EOI scale content: this included adapting the existing contents or generating new culturally specific EOI scales. Two studies (15%) used EOI scales whose contents were adjusted a priori and tested their ability to predict relapse outcomes.

*Adjusting EOI Threshold for Overall EE Index.* The first US EE study found that an EOI cutoff of 4, in combination with a CC cutoff of 6, provided the best discrimination between relapsers and nonrelapsers,<sup>13</sup> confirming the original UK findings. However, the standardized cutoff was later adjusted to 3 or more. King and Dixon<sup>34</sup> also found that an EOI cutoff of 3 or more, in combination with 7 CCs, provided the best discriminative function regarding relapse outcomes in a Canadian sample. However in Italian<sup>47</sup> and British Pakistani<sup>21</sup> samples, only an EOI score of 4 or more enabled the global EE index to predict relapse. In their Swiss-French sample, Barrelet et al<sup>22</sup> found that the overall EE index had better predictive validity for relapse over 9 months if it was based on CC alone.

*Adjusting EOI Threshold for EOI Index.* A number of studies have attempted post hoc adjustments to the EOI scale to improve its predictive validity. In their Canadian sample, King and Dixon<sup>34</sup> found that reducing the EOI cutoff score to 1 or more improved the predictive validity of mothers’ EOI on relapse at 9 months from a trend ( $P < .10$ ) to a significant association ( $P < .05$ ). However, they could find no cutoff that would enable mothers’ EOI to predict relapse at 18 months nor fathers’ EOI to predict relapse at 9 or 18 months. In Italian, Indian, and Australian samples, researchers were unable to find cutoff points on the EOI scale that discriminated between relapsers and nonrelapsers.<sup>26,36,43</sup> Parker et al<sup>36</sup> reported a trend for “lower” scores to be associated with “higher” relapse rates.

*Exploring Contents of EOI Scales.* Healey et al<sup>48</sup> investigated the validity of the LEE scale<sup>6</sup> for use in Singapore. They first compared 10 Singaporean-Chinese patients and carers rated high EE to 10 rated low EE on the LEE and compared the behaviors and attitudes exhibited to those highlighted as typical of high and low CC, EOI, and hostility in Western cultures, as defined by Leff and Vaughn.<sup>8</sup> They found clear examples of each of the “Western” EOI attitudes and behaviors in their sample. Secondly, 4 focus groups explored the contents of LEE. Participants generally reported that the items on the intrusiveness scale (EOI) represented intrusiveness in their culture as well, with levels of agreement ranging between the items from 70% to 85%.

Two studies have specifically adjusted CFI norms for cultural context.<sup>14,49</sup> In one study of Mexican Americans, adaptations were made to the EOI scale using an anthropological approach whereby the original behavioral, attitudinal, and affective domains of EOI were redefined within values and norms of Mexican American culture. It is not clear from the article how these adjustments were made, but the authors state that “as we imagined, the particular nature and meaning of EOI among Mexican relatives was not the same as among British

**Table 2.** Summary of Studies of Adapting Scales and Norms for Measuring EOI Across Different Cultural Groups

Study	Setting/Cultural Group	Adjustment to Data	Main Findings
Adjusted EOI cutoff in overall EE index: post hoc adjustment to improve predictive power of global EE index			
Barrelet et al <sup>22</sup>	Swiss-French	Conducted post hoc adjustment to CFI-EOI scale cutoff to improve discriminative power of global EE index	Using standard cutoff points, high EE predicted an increased likelihood of relapse. However, post hoc analysis revealed that a global EE index based only on number of CC discriminated better between relapsers and nonrelapsers: only the number of CC was related to relapse in this cohort; there was no critical cutoff point for EOI
Bertrando et al <sup>47</sup>	Italy	As above	Using 6 or more CC, 3 or more EOI, and positive hostility rating, EE was not associated with relapse. Raising EOI cutoff from 3 to 4 led to relapse being significantly higher among high EE families ( $P < .05$ )
King and Dixon <sup>34</sup>	Canada. 87% White, 10% Black, and 3% Asian	As above	At both 9 and 18 mo, the dichotomized household EE score that achieved the greatest discrimination between relapsers and nonrelapsers was 7 CCs, 3 on EOI, and 1 on hostility
Hashemi <sup>21</sup>	United Kingdom: 33% White British; 33% White Pakistani; and 33% White Sikh	As above	Using standard cutoffs, high EE predicted relapse in white but not Pakistani or Sikh families. When EOI cutoff raised from 3 to 4, high EE did predict relapse in Pakistani families. However, no effect of changing EOI threshold in Sikh families
Vaughn et al <sup>13</sup>	US Anglo-Americans only	As above	Using a CC threshold of 6 and an EOI threshold of 4 provided the best discrimination between relapsers and nonrelapsers
Adjusted cutoff for high EOI in EOI index: post hoc adjustment to improve predictive power of EOI index			
King and Dixon <sup>34</sup>	Canada: 87% White, 10% Black, and 3% Asian	Conducted post hoc adjustment to CFI-EOI scale cutoff to improve discriminative power of EOI index	Trend for higher EOI in mothers to be associated with relapse at 9 mo became significant when cutoff score for high EOI reduced to 1 ( $P = .035$ ). No cutoff could be found for fathers' EOI that discriminated relapsers from nonrelapsers at 9- or 18-mo follow-up nor in mothers at 18 mo
Montero et al <sup>26</sup>	Italy	As above	Post hoc analysis revealed that no cutoff point for EOI scale discriminated between those who relapsed and those who did not
Parker et al <sup>36</sup>	Australia	As above.	Post hoc analysis revealed that no cutoff point for EOI scale discriminated between those who relapsed and those who did not, although there was a trend for low EOI to be associated with higher relapse rates

Table 2. Continued

Study	Setting/Cultural Group	Adjustment to Data	Main Findings
Adjusting or assessing suitability of scale contents			
Healey et al <sup>48</sup>	Singaporean-Chinese	Study 1: Sample divided into a high and low EE group using LEE. Interview contents of high and low EE relatives compared to Leff and Vaughn's (1985) definitions of EE dimensions Study 2: 4 focus groups studied LEE intrusiveness scale items and commented on whether reflected underlying concepts, normativeness of behaviors	Study 1: Overall, the behaviors and attitudes of those classified as low EE mapped onto Leff and Vaughn's definitions of EOI  Study 2: Data from focus groups supported cross-cultural conceptual and operational equivalence of this scale. Participants agreed that items on the intrusiveness scale generally reflected intrusiveness; some disagreement re checking up on patient to see what they're doing as this could depend on circumstances
Jenkins <sup>14</sup>	US Mexican Americans only	Adapted contents of CFI-EOI scale by identifying behaviors considered culturally abnormal by Mexican Americans. Then looked at all high EOI families (11 of 70) to identify attitudes and behaviors typical of relatives with high EOI in a Mexican American context	Nature and meaning of EOI differed between Mexican relatives and British or Anglo-American relatives. Behaviors identified as high EOI in Mexican Americans included: (1) somatic complaints specifically in relation to relative's illness; (2) suicidal thoughts in relation to relative's illness; (3) risking dangerous circumstances by enduring highly threatening or physically abusive behaviors; and (4) abandonment of employment or social activities to stay home and guard or protect ill relative
Mahmood et al <sup>49</sup>	Pakistan	Developed items for an indigenous EE questionnaire using Brown's EE theory. These items were then given to 6 judges/experts to assess relevance and suitability to each EE dimension. Items that had 80 % or more consensus were included. Final version consisted of 25 items. Used to measure EE at baseline in families with and without schizophrenia	The schizophrenic group scored significantly higher on EE and EOI than the control group, suggesting that the measure has discriminant validity
Testing predictive validity of adjusted norms			
Breitborde et al <sup>38</sup>	Mexican Americans	Scores for EOI were adjusted to be congruent with the expression of EOI among Mexican Americans, in line with Jenkins <sup>14</sup>	Found curvilinear relationship between EOI in Mexican Americans at baseline and relapse risk 9 mo later

Note: LEE, level of expressed emotion. Abbreviations are explained in the first footnote to table 1.

relatives."<sup>14(pp208)</sup> These adjusted norms were then used to rate relatives' EOI levels. The interviews of those rated as high EOI ( $n = 11$ ) were then studied to identify culturally typical high EOI behaviors. These included somatic complaints specifically in relation to relative's illness, suicidal thoughts or death wishes among carers, and abandoning employment or social activities to care for the ill relative. Breitborde et al<sup>38</sup> used Jenkins' adjusted norms to rate

families' EE and found evidence for a curvilinear EOI-relapse relationship.

The second study was from Pakistan. Using Brown's EE theory Mahmood et al<sup>49</sup> developed their own EE questionnaire, including an EOI scale and then sought expert advice on acceptability and suitability of culture-specific EE items generated. Items with 80% or more agreement were included in a scale, generating

a measure with 25 items. The measure was found to have discriminant validity: Pakistani families of schizophrenic patients scored significantly higher on EE and EOI than a Pakistani control group. However, the article did not report how these culture-specific items differed from EE or EOI as defined in Western measures.

## Discussion

EE research has been a major driver for the development of family interventions in psychosis.<sup>50</sup> EOI is 1 of the 3 contributors to high EE, and reducing high EOI is an explicit aim of such interventions. Bhugra and McKenzie<sup>18</sup> have suggested that studies of EE “must be accompanied by fieldwork to establish the norms (of EE) and their (cultural) context.”<sup>(p343)</sup> To use an analogy, if EE and EOI are markers of the “emotional temperature” of a family, researchers must first establish the “normal” temperature of families from a cultural group before determining whether temperature higher than that norm is pathological requiring remedy. We conducted a systematic review to assess whether studies investigating EOI-psychosis outcomes across cultures have conducted such fieldwork or explored specific cultural contexts.

Strengths of this review include a systematic and thorough search. However, there are some limitations. The heterogeneity of studies hindered comparisons and precluded a meta-analysis that could allow for quality adjustments. Studies have used very different methods of defining relapse and also different measures of EOI including CFI, LEE, and FMSS. FMSS is known to underestimate scores of the CFI in 20–30% cases. Hence, a relative rated low EE on FMSS may not be rated low on CFI.<sup>51</sup> This is not surprising—a FMSS is too short an assessment to accumulate the evidence needed for EOI rating. Some potentially relevant articles were unavailable and non-English articles were excluded. Many cultures remain unrepresented because of a lack of relevant research. It was difficult to develop a coherent system for categorizing cultural, racial, or ethnic groups. Indeed, we can be criticized for using the term “cultural context” when we are referring to groups recruited from the same geographical location within which cultural contexts may significantly vary.

We found that the relationship between EOI and outcomes is inconsistent. In European samples, 5 of 8 studies found no relationship between EOI and relapse or rehospitalization. However, the majority used the FMSS ( $n = 3$ ), which under-detects EOI, and had long follow-up periods ( $n = 4$ ), which are associated with weaker EOI-outcome relationships. In Asian samples, only 1 of 6 studies identified a significant relationship. The use of the FMSS in 2 Asian studies and a small sample size in another might explain this lack of a positive finding. From the available evidence, however, we can reasonably conclude that a high EOI-poor outcome relationship across cultures is far from proven.

There are 3 possible explanations for our findings. The first is that high EOI does not have a detrimental effect on patient outcomes in all cultures. Our findings do not show this because we simply report an absence of evidence; we did not find evidence for the absence of a relationship between EOI and outcomes across cultures. EOI is ultimately about the transgression of interpersonal boundaries, the balance between proximity and autonomy. Even in cultures with a collectivistic sense of self, there must be an interpersonal boundary, the breach of which leads to the breakdown of an individual’s capacity for self-protection, and beyond which others become “too close for comfort.”<sup>14</sup> High EOI, beyond that cultural norm, is likely to be detrimental to the patient’s well-being.

The second explanation for our findings is that while an EOI-outcome relation exists across all cultures, current ratings for EOI are not culture-specific. Hence, the rating process rather than the construct itself needs modification. Lopez *et al*<sup>17</sup> have argued that EE ratings should not be adjusted in different cultural contexts. If such adjustments are made, researchers should test “whether the culturally adjusted EE domain measures have incremental predictive validity compared with the unadjusted measure.”<sup>(p11)</sup> We found that many studies have made such post hoc adjustments to EOI threshold, but with mixed success. Some studies confirmed the current threshold or identified another cut-off to confirm EOI-outcome relationship, while others failed to identify any EOI cutoff that discriminated between relapsers and nonrelapsers. Studies that opted for a priori adjustments highlight differences in behavioral and attitudinal norms between, for instance, Mexican American and original CFI norms.<sup>14</sup> Future cross-cultural studies should therefore collect normative cultural data from a nonclinical general population to understand the meaning of EOI within that cultural context, taking into account attitudes to illness and role expectations of both the patient and carers.

The third possibility is that the effect of EOI on outcomes is altered by some other and as yet unexplored dimensions of family climate and interpersonal relationships. In their original work, Brown *et al*<sup>7,16</sup> identified an additional EE factor—warmth—which included sympathy, concern, positive comments, interest in other as a person, and expressed enjoyment in mutual activities. High ratings of warmth often accompanied ratings of high EOI. Yet, warmth was excluded from the final EE construct, and EE came to have an exclusively negative connotation. There has been very little research on the positive and protective aspects of family influences in psychosis. Families are still largely perceived as generators of pathology and risk rather than as providers of resilience and protection. Family influences cannot solely be pathological; these might be protective as well. The protective aspects of family influence remain neglected in research. One study has reported that family warmth is a significant protective factor against relapse among



Mexican Americans.<sup>52</sup> In countries with poor mental health provision, no mental health legislation and few state benefits, family protectiveness may be the only determinant of whether a mentally ill individual receives care or ends up a destitute. The enduring mystery of a better outcome of psychotic disorders in countries such as India may well be related to family support.<sup>53</sup> The role of families in the care and outcomes of psychotic disorders therefore needs a fresh evaluation. Our findings suggest that the current paradigms of EE and EOI are too “culture-free” to be useful in non-Western settings.

The commonest explanation for the impact of EOI on psychosis is that it causes stress in patients and triggers autonomic arousal exacerbating symptoms and causing relapse.<sup>54</sup> Hence, an alternative way to understand and measure the impact of EOI is to develop patient-rated subjective measure of interpersonal stress in family environments. Another fruitful area of inquiry is the relationship between EE and acculturation, as attempted by Jenkins et al.<sup>14</sup> First, second, and third generation immigrants may completely differ in their levels of EE. In immigrant families, cultural values may be fluid and dynamic over generations rather than linked to the “home culture” the first generation has left behind.

Our findings have major clinical implications for provision of family interventions in multicultural settings. The prevalent concept that high EOI is necessarily detrimental to patient health risks pathologizing what may be a cultural norm. Minority patients from such cultures are likely to perceive EE-based family interventions as intrusive and inappropriate and drop out of care rather than engage. However, ignoring high EE simply as a cultural variation entails a different risk, namely that problematic and potentially damaging family relationships are considered a cultural norm and hence ignored. Given the current uncertainty of how to culturally adjust EOI concept and ratings, clinicians offering family interventions face a dilemma. The best way forward for now is to explore the subjective experience of stress and arousal in a patient when high EOI is suspected rather than assume that high EOI in a carer is necessarily a target for intervention. Since non-EE-based interventions, such as problem-solving<sup>55</sup> and multiple family psychoeducation programmes,<sup>56</sup> are also effective in reducing family stress and improving patient outcomes, family interventions need not be exclusively EE focused.

In their original studies, Brown et al.<sup>7,16</sup> stated that their EE based suggestions for clinical intervention were at best “fallible rules.” Clinicians and researchers need to be similarly alert to the fallibility of applying EOI ratings and measurement when addressing EE-related problems across cultures. We should be studying cross-cultural aspects of family care across the entire spectrum of EE constructs.

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