

## Supplementary material

### Supplementary Table 1 Brief description of Mental Health Questionnaires, the scales used and published evidence of their relevance to BAME population.

Mental Health Questionnaires	Scale	Relevance to BAME population
EPDS (Edinburgh Postnatal Depression Scale)	10-item questionnaire; Scores of 10-12 represent borderline and 0-9 not depressed	Used in Caribbean women with Perinatal depression (Edge et al., 2004) Also validated in Nigerian women (Uwakwe et al 2003)
STAI (State-Trait Anxiety Inventory)	20-item questionnaire; 4-point scale from 'almost never' to 'almost always';	Used on ethnically diverse adolescents in Hawaii (Hishinuma et al. 2000). An interaction between ethnicity and STAI factor scores indicated an atypical pattern for Caucasians in this study.
HADS-A (Hospital Anxiety and Depression Scale-Anxiety)	14-item questionnaire; 4-point scale from 'rarely or not at all' to 'definitely or most of the time'	It is one of the National Institute for Health and Care Excellence (NICE) recommended tools for diagnosis of depression and anxiety. Validated in Iranian version (Montazeri et al. 2003)
CES-D (Centre for Epidemiological Studies Depression)	0-3; 0= rarely or none of the time, 1= some or little of the time, 2= moderately or much of the time and 3= most or almost all of the time.	Has been adapted to the Korean version (CES-D-K) this was reliable and valid for Korean (Cho & Kim, 1998) and Armenian population (Demirchyan, Petrosyan & Thompson (2011). CES-D Cronbach's $\alpha = 0.825$ indicative of high internal reliability in Bolivian patients Schantz et al., 2017). In South Africa the 10 item version was validated in the Zulu, Xhosa and Afrikaans population (Baron, Davis & Lund, 2017) ( $\alpha = 0.69-0.89$ ), and adequate concurrent validity
BDI-II (Beck's Depression Inventory-II)	Each item is rated on a 4-point scale ranging from 0-3 and has a total score of 63. Ranges 0-13- minimal; 14-19 mild; 20-28 moderate and 29-63 severe depressive symptoms	This scale is widely used in psychiatry. Validated in a study on Nigerian adolescents (Adewuya et al. 2007), on Portuguese-speaking Chinese community in Brazil (Wang et al. 2005), on low literacy population in Kenya (Abubakar et al. 2016), etc.
POMS (Profile of Mood States)	65 questions; 5-point scale - 'Not at all', 'a little', 'moderately', 'quite a lot', or 'Extremely'	Validated in a study on Korean elders (Shin et al. 2000). Turkish version of POMS was validated on mechanically ventilated patients (Iyigun et al. 2016)
PSI (Parent Stress Index)	18-item questionnaire; 5-point scale from 'Strongly disagree' to 'Strongly agree'; Output range of PSI is 18 (low stress) to 90 (high stress)	PSI index has been translated to Hindi to study Indian parents (Sethi, Gandhi and Anand 2012), and to Chinese for a study with parents in Hong Kong (Ma et al. 2000). But to our knowledge there is no published evidence of suitability of the measure across different ethnic or linguistic groups
PPQ (Professional Personality Questionnaire)	110-item questionnaire; Contains 10 scales; Response ranges from 'Strongly disagree' to 'Strongly agree';	There is no published evidence to our knowledge on suitability of the measure across different ethnic groups.
PSM (Perceived Stress Measure)	10-item questionnaire. 5-scale response	The Arabic version of the Cohen Perceived Stress Scale (PSS-10) was validated among pregnant and

	ranging from 'Never' to 'Very Often'	postpartum women (Chaaya et al, 2010). Thai version of PSS-10 was found to be reliable on Thai population (Wongpakaran et al, 2010). Malay version was validated among nurses in Malaysia (Sandhu et al, 2015)
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**Brief descriptions:**

**EPDS:** The Edinburgh Postnatal Depression Scale (EPDS) is a 10-item questionnaire identifying with depressive and anxiety symptoms elicited during the postnatal and antenatal period. However, EPDS is not a diagnostic tool. It is useful as a screening tool and is beneficial for follow-up care where a psychiatric diagnosis is eminent. It is reported EPDS should be administered at least twice during the antenatal and postnatal (6-12 weeks post-delivery) period. Therefore, some studies have demonstrated a clear scientific rationale for using EPDS at specific timepoints. A disadvantage, however, is that EPDS remains non-specific to BAME populations. There could be cultural adaptations that may be required to make the questionnaire more relevant to BAME groups.

**STAI:** State-Trait Anxiety Inventory is a commonly used measure of trait and state anxiety used in clinical settings to diagnose anxiety and to distinguish it from depressive syndromes. This questionnaire has 20 items for assessing trait anxiety and 20 for state anxiety, each rated on a 4-point scale, with higher score indicating greater anxiety. Internal consistency coefficients for the scale have ranged from .86 to .95; test-retest reliability coefficients have ranged from .65 to .75 over a 2-month interval (Spielberger et al., 1983). Considerable evidence attests to the construct and concurrent validity of the scale (Spielberger, 1989).

**HADS-A:** Hospital Anxiety and Depression Scale is a 14-item questionnaire, 7 for depression and 7 for anxiety used on general medical population of patients and is popular for its simplicity, speed, and ease of use. It is one of the National Institute for Health and Care Excellence (NICE) recommended tools for diagnosis of depression and anxiety

**CES-D:** The centre for epidemiological studies-depression (CES-D) is a 20-item scale used to rate caregiver's experience of depression symptoms such as poor appetite, insufficient sleep and loneliness over the past week. Responses to these questions range from 0 to 3 where the total score could be 0 to 60. CES-D provides cut off scores which aids with identifying those with a higher risk of clinical depression. Roberts and colleagues (1997) report that CES-D demonstrates a high level of specificity, consistency and sensitivity, therefore, would be useful to determine differences between caregivers and non-caregivers (Pinquart et al 2003). Pinquart and colleagues (2006) also reports CES-D is suitable to determine post-interventional depressive symptoms in non-caregivers. Although, the use CES-D within BAME populations may requires further evaluation given the lack of different factor structures such as cultural paradigms relevant to ethnic caregivers.

**BDI:** The Beck Depression Inventory (BDI) is a self-reported measure with 21 questions and is a commonly used inventory to measure severe depression. BDI measures depression beyond the psychodynamic perspective by analysing the patient's own thoughts and the intensity of the depression syndrome. Therefore, BDI could be used in both clinical and non-clinical populations. Clinical observations using BDI have a rating scale of 0-3.

**POMS:** Profile of Mood States is a standard validated psychological test formulated by McNair et al. (1971) containing 65 words/statements that describe people's feelings. This rating scale is used to assess transient, distinct mood states. The POMS measures six different dimensions of mood swings. These include Tension or Anxiety, Anger or Hostility, Vigor or Activity, Fatigue or Inertia, Depression or Dejection, Confusion or Bewilderment.

**PSI:** Parent Stress Index by Berry and Jones (1995) is an index used to measure the relative stress in the parent-child relationship. Child characteristics in the full scale include Distractibility/Hyperactivity, Adaptability, Reinforces Parent, Demandingness, Mood, and Acceptability. Parent measures include Competence, Isolation, Attachment, Health, Role Restriction, Depression, and Spouse. The PSI is used for early identification of dysfunctional parent-child interactions; parental stress; family functioning; risk for child abuse and neglect; and also, for evaluation of child custody decisions.

**PPQ:** Professional Personality Questionnaire is an assessment tool that profiles the specific personality traits, attitudes and behavioural styles that are associated with success in a professional environment. The questionnaire consists of 110 questions, contains 10 scales and is ideal for use with any role where quality and/or customer service is important. The PPQ scales measure 5 broad scales namely Insecurity vs Confidence, Conscientiousness vs Carelessness, Introversive-Extraversive, Tough vs Tender-Minded, and Conventional vs Unconventional (Barrett, 2002)

**PSM:** Perceived Stress Measure or Perceived Stress Scale (PSS) by Cohen is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. This 10-item questionnaire was designed for use in community samples with at least a junior high school education

### **Conclusion:**

There is minimal evidence to suggest the administering of these MH questionnaires were of relevance to PTB mother within the BAME population due to its non-specificity, lack of cultural adaptation and evidence demonstrating its validity. As a result, a key recommendation would be to develop better assessment tools for future

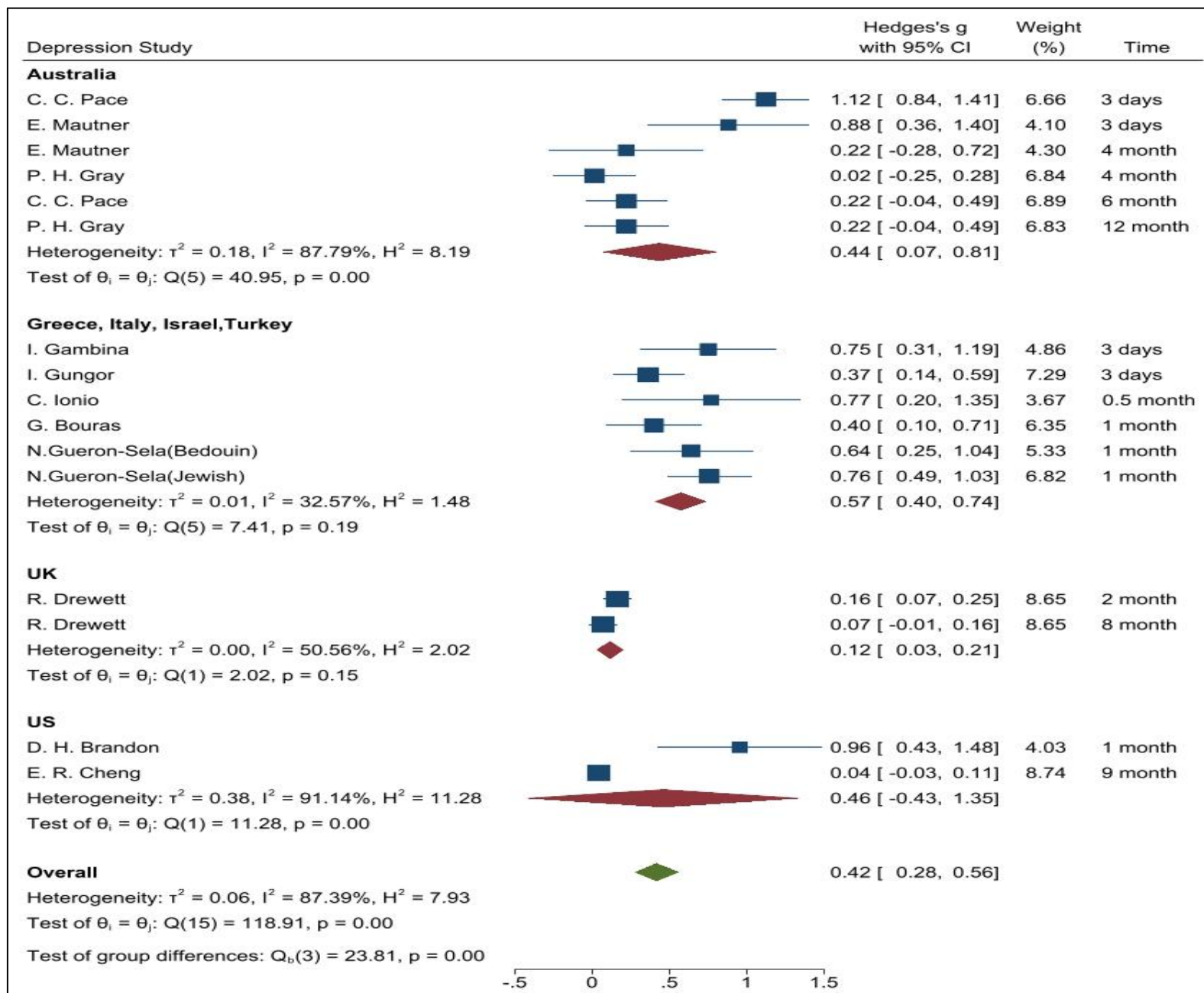
BAME populations of patients to better determine symptomatology and determine a clinical diagnosis where appropriate with a view to treat.

## References

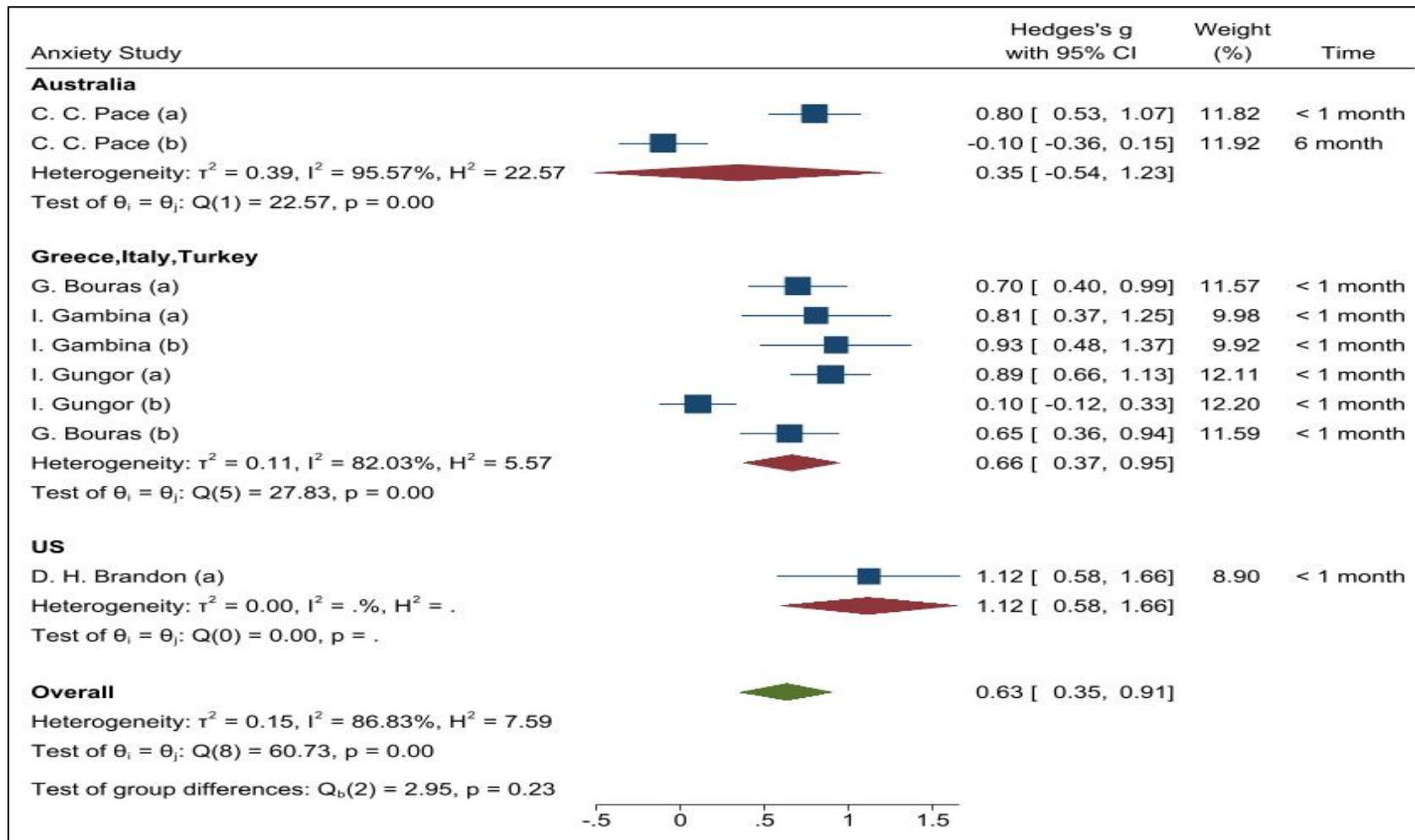
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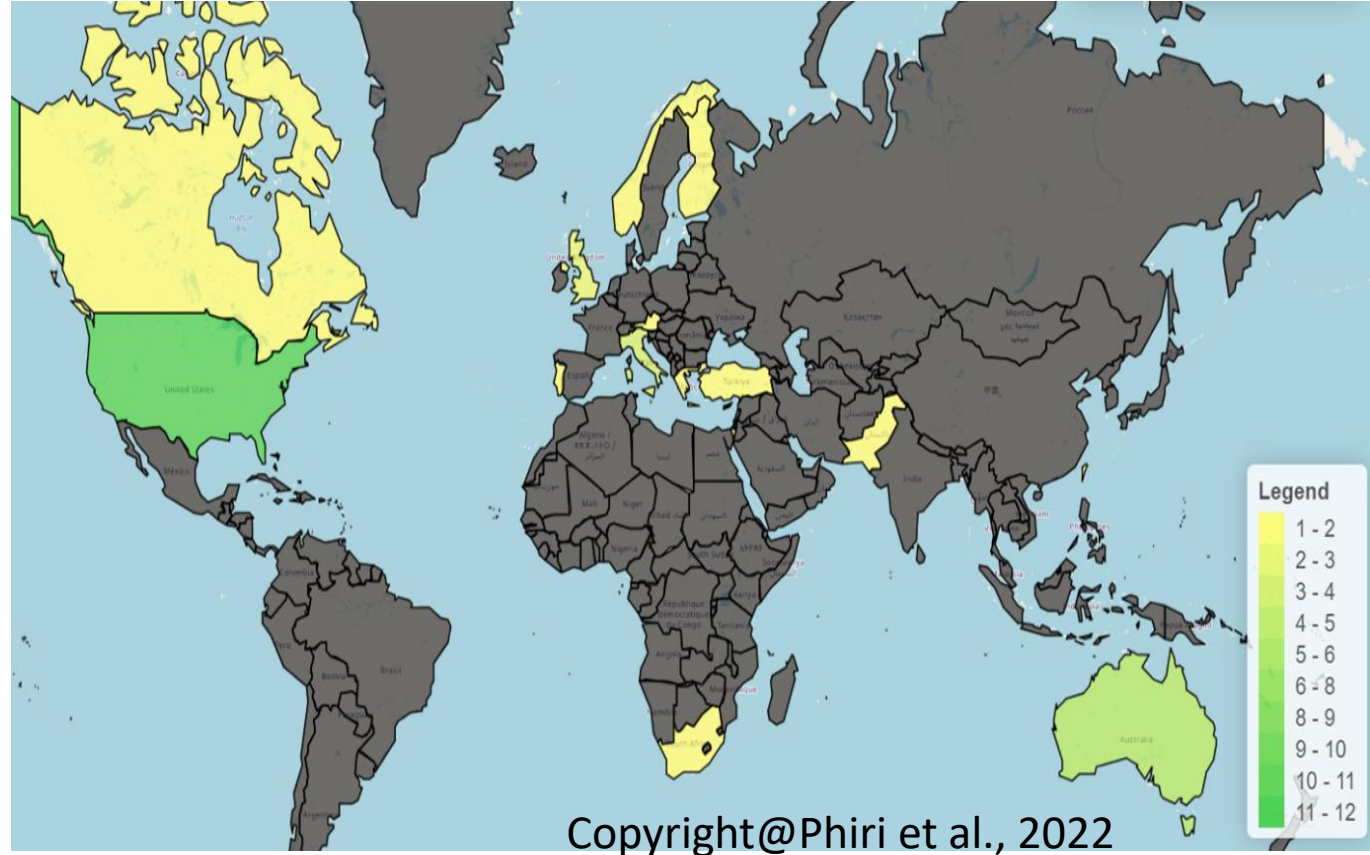


**Supplementary Figure 1** The subgroup analysis conducted by region.

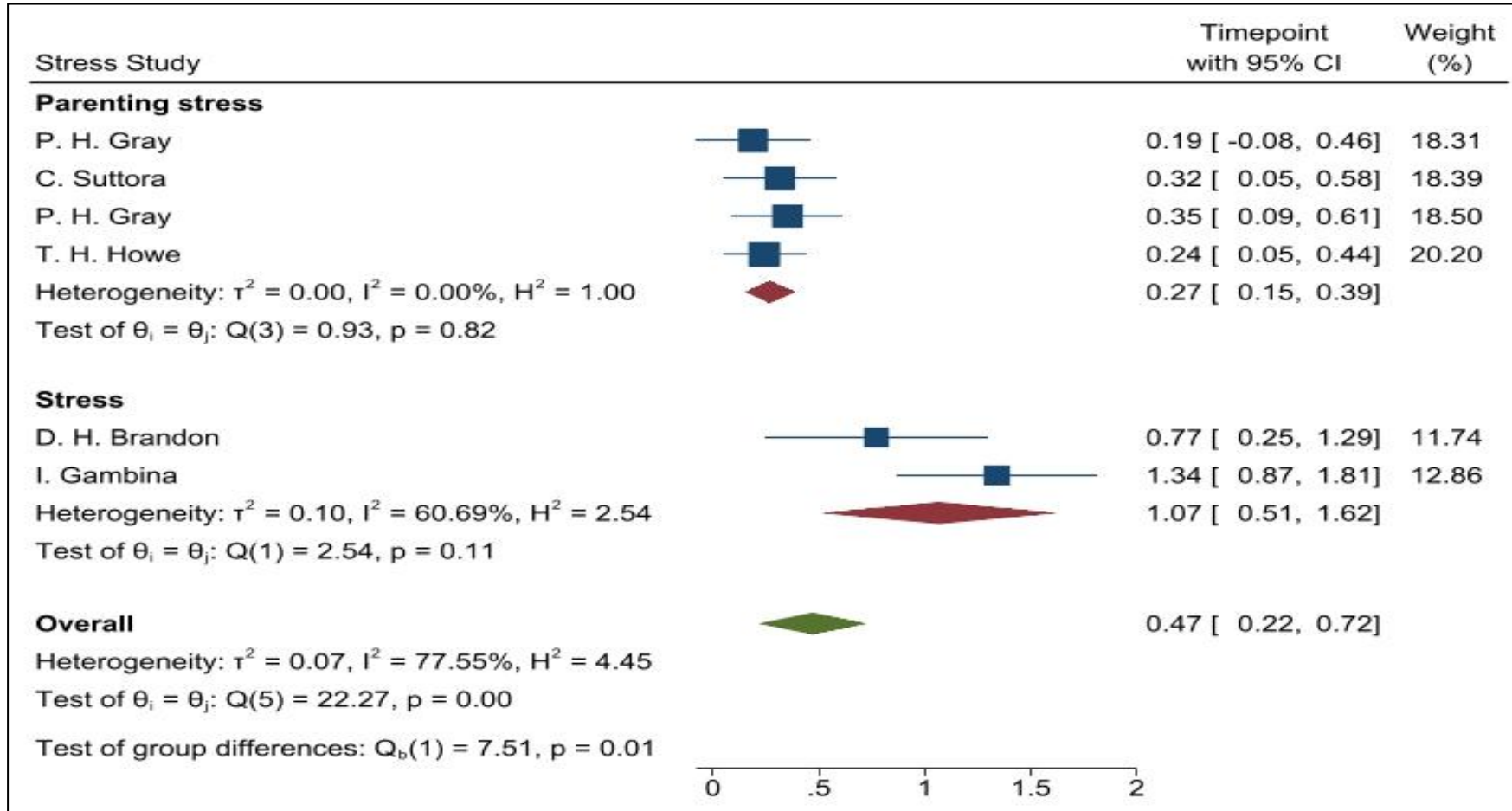


Supplementary Figure 2 The subgroup analysis conducted by region for anxiety.

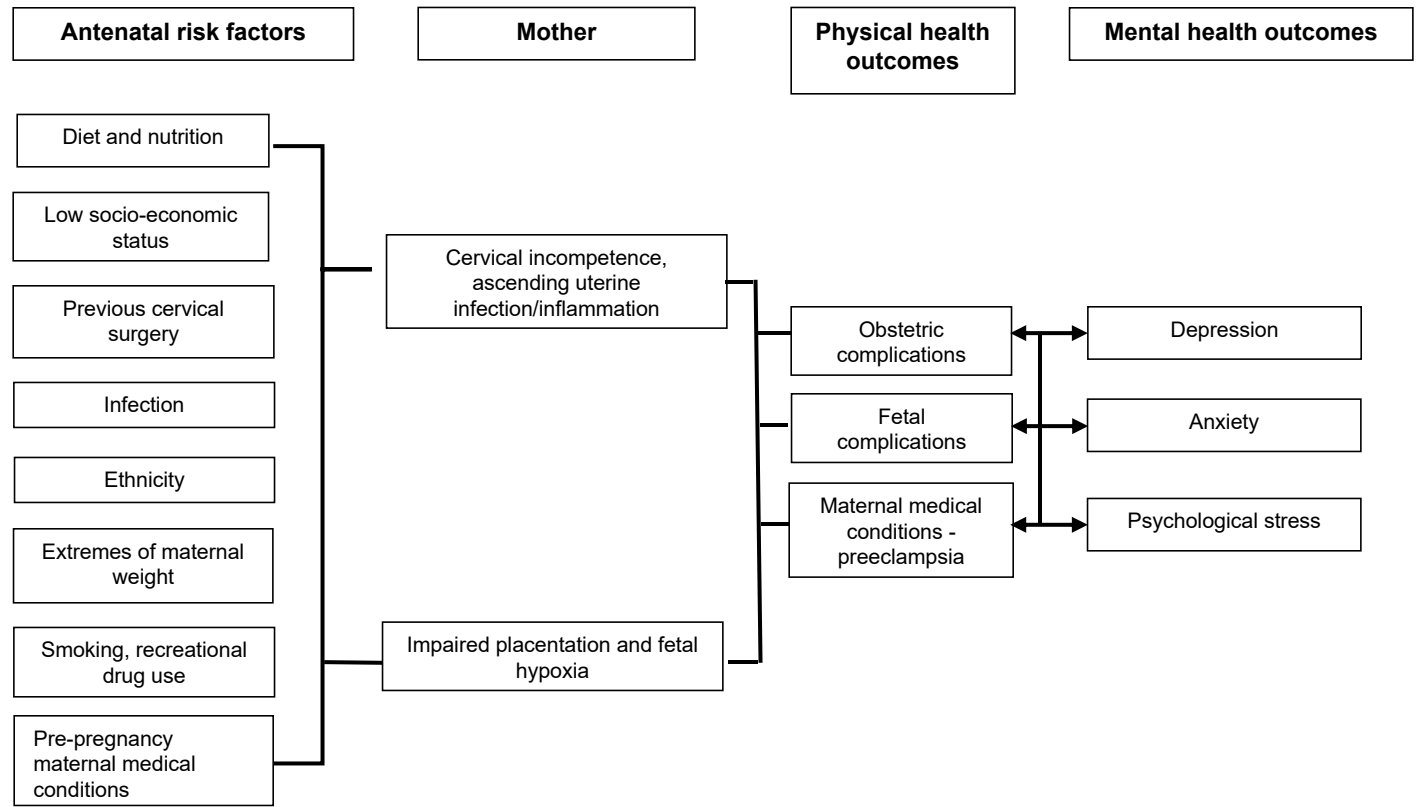




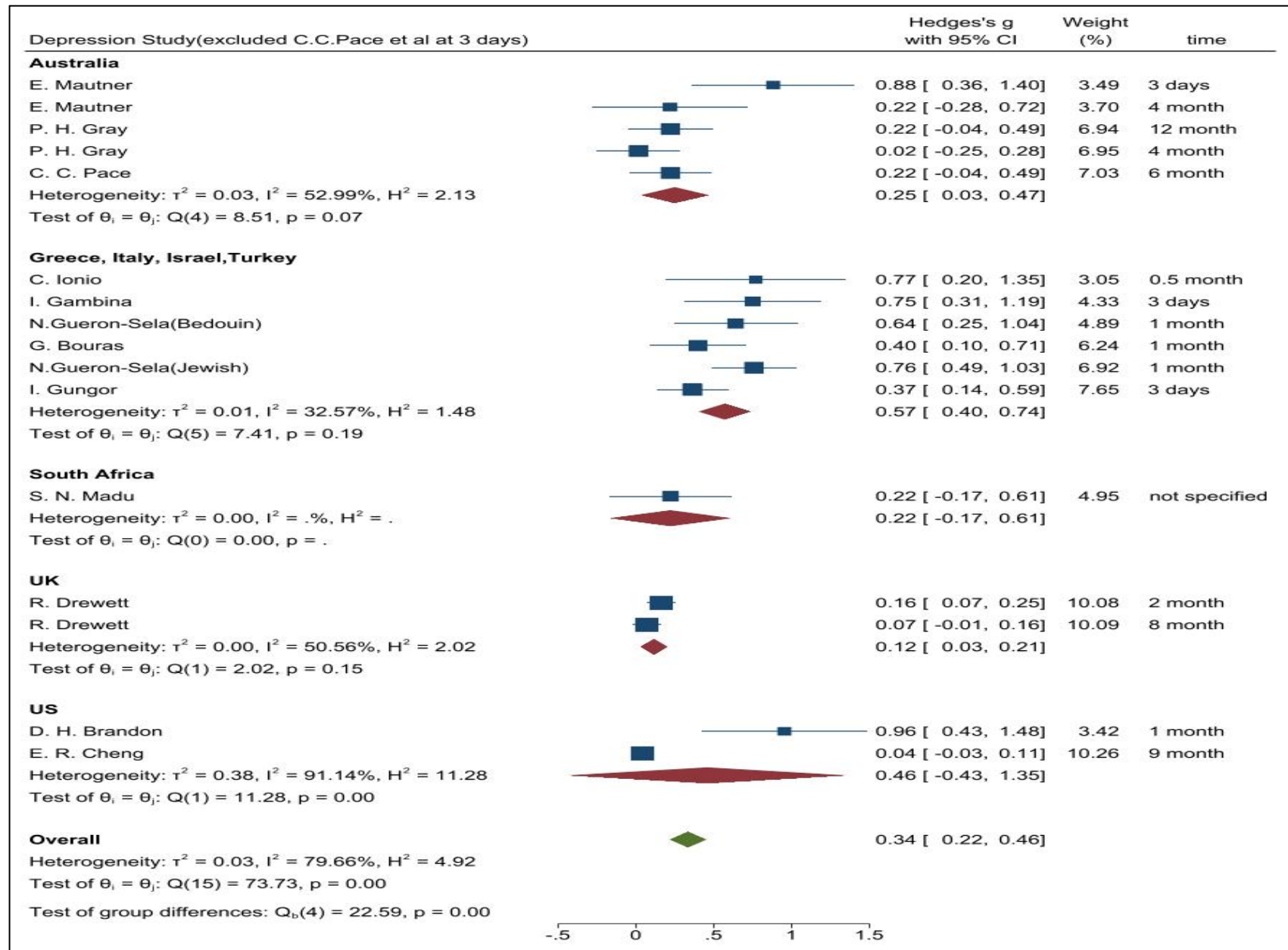
**Supplementary Figure 3 The subgroup analysis conducted by outcome for stress.**



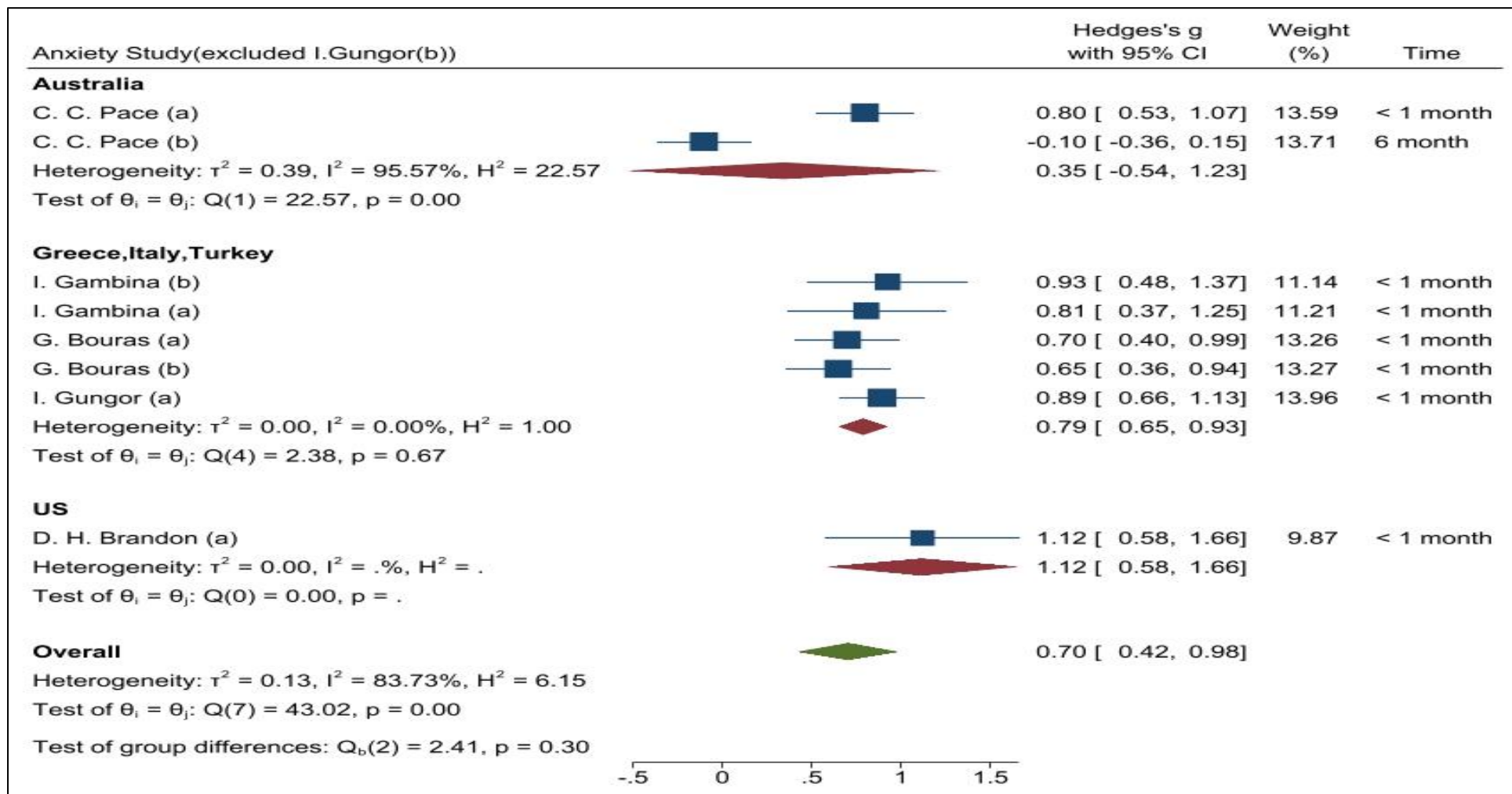
**Supplementary Figure 4 The subgroup analysis conducted by outcome for stress.**



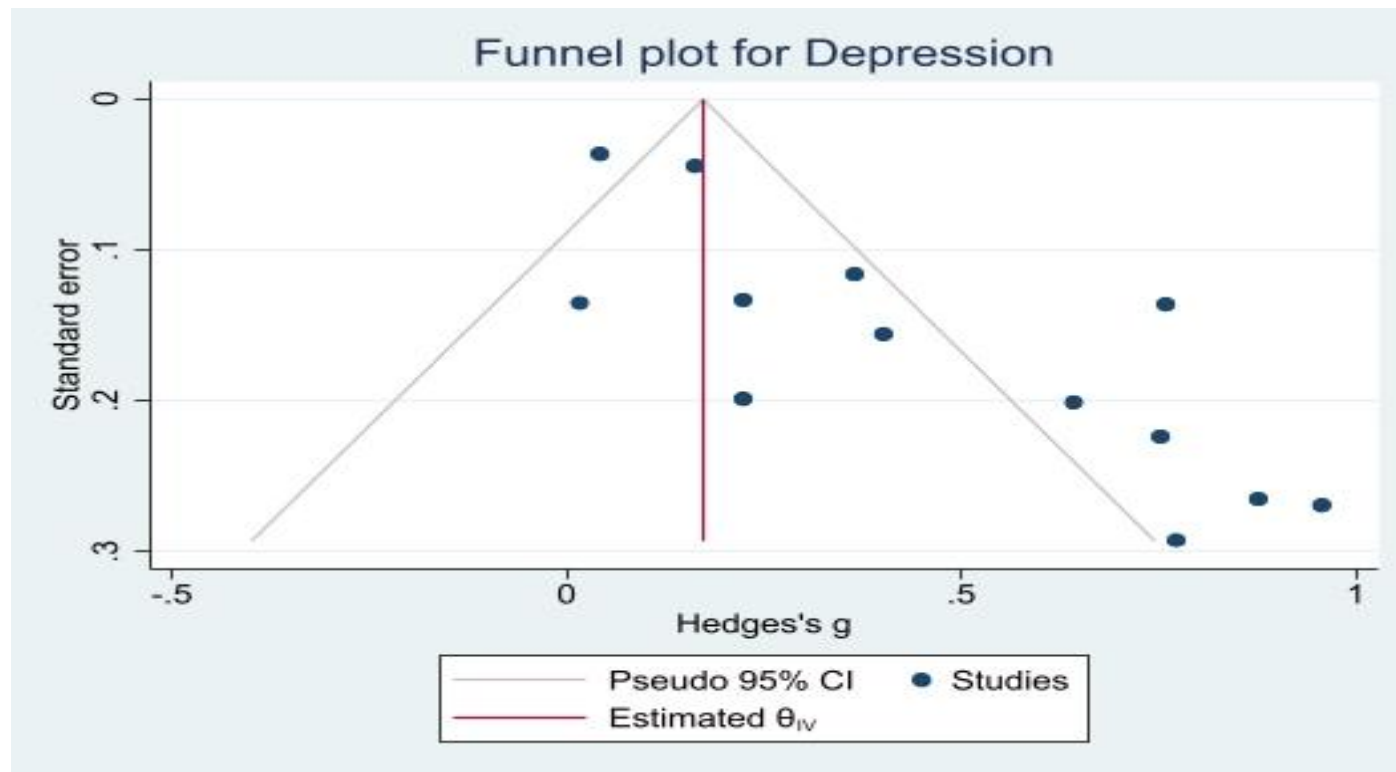
**Supplementary Figure 5 Preterm birth and Mental Health ‘Causation Tree’.**



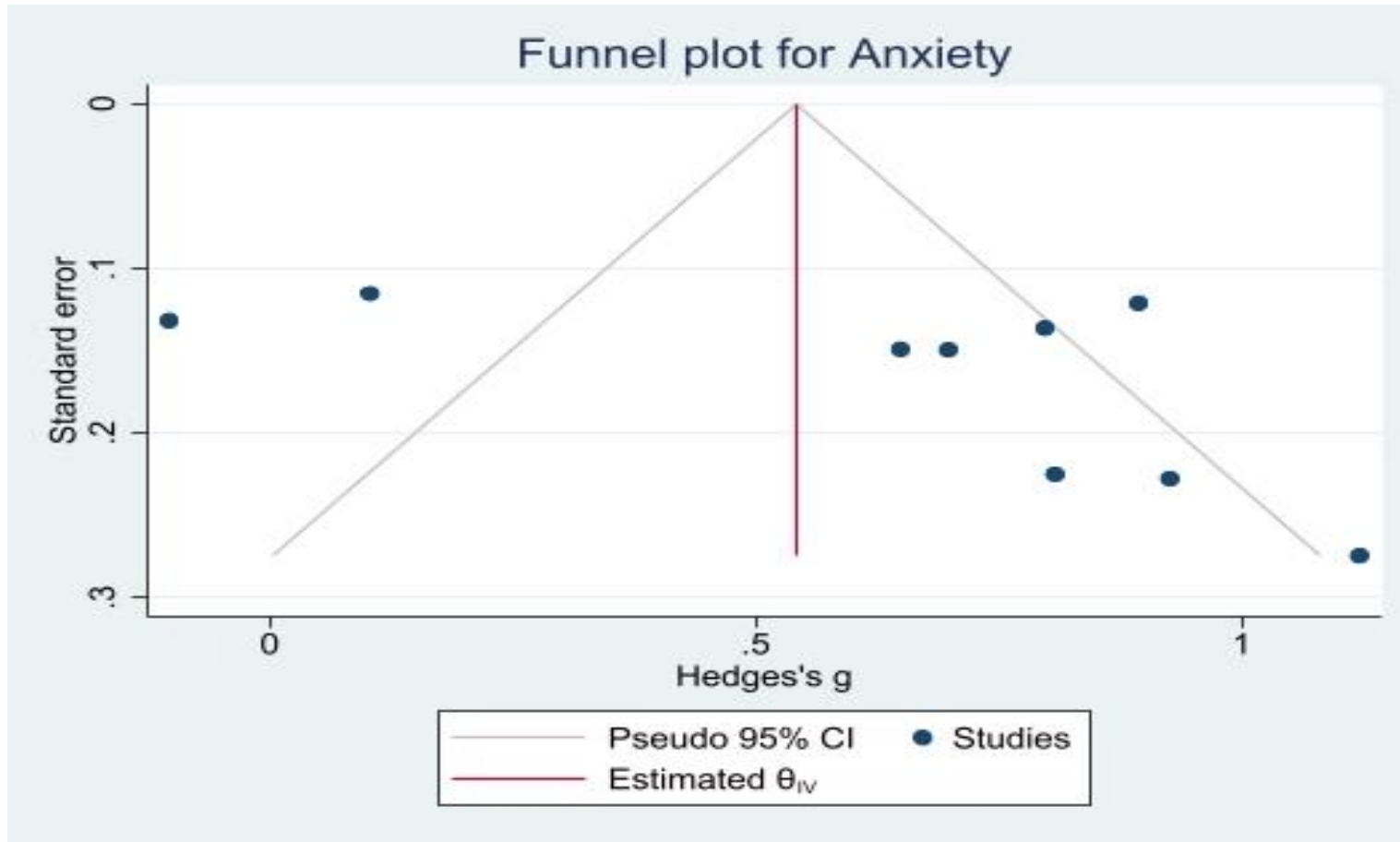
**Supplementary Figure 6 The sensitivity analysis excluded one depression study (C.C.Pace et al).**



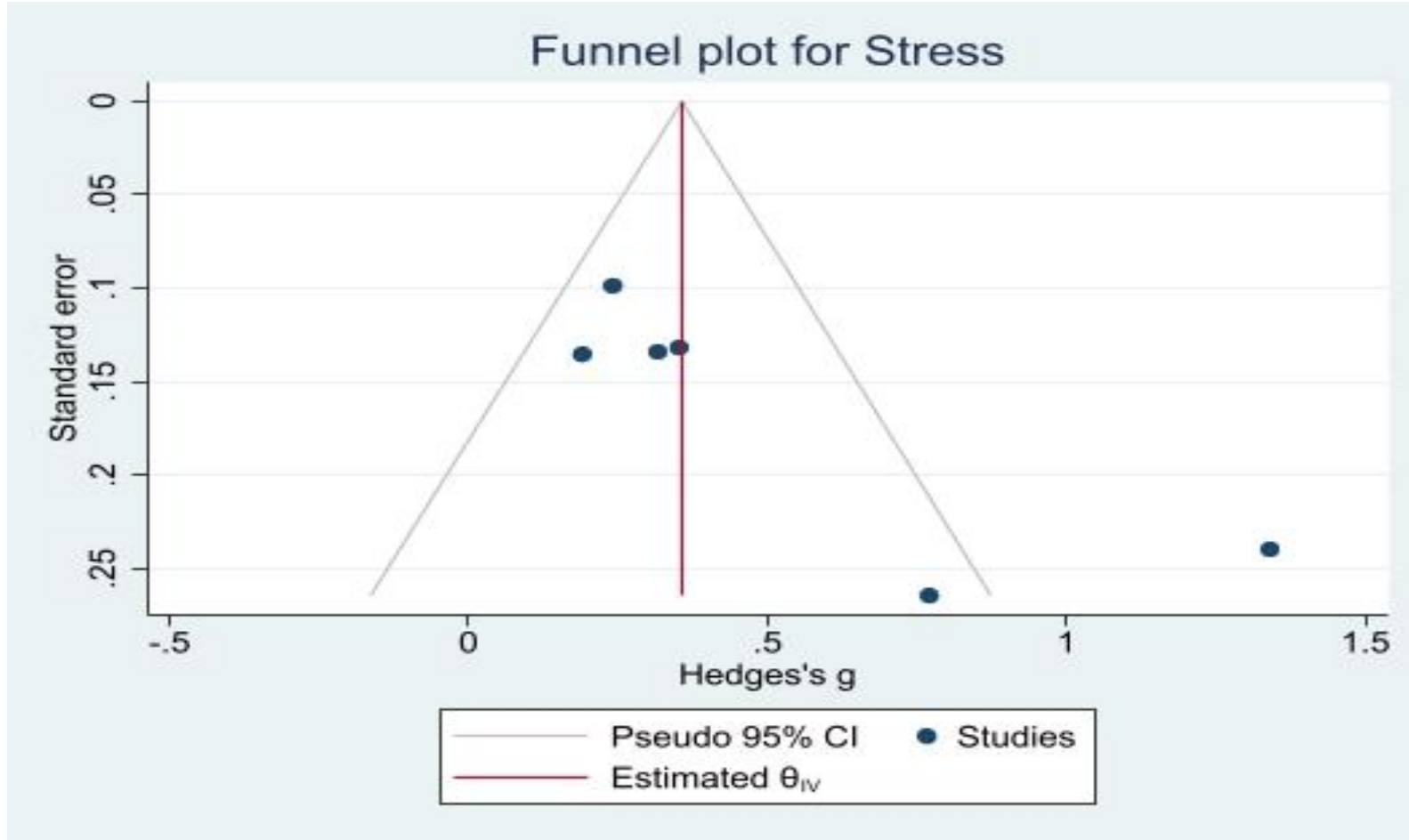
Supplementary Figure 7 The sensitivity analysis excluded one study (Gungor (b) et al [35]).



Supplementary Figure 8 Funnel plot of studies for depression comparing full term vs preterm birth.



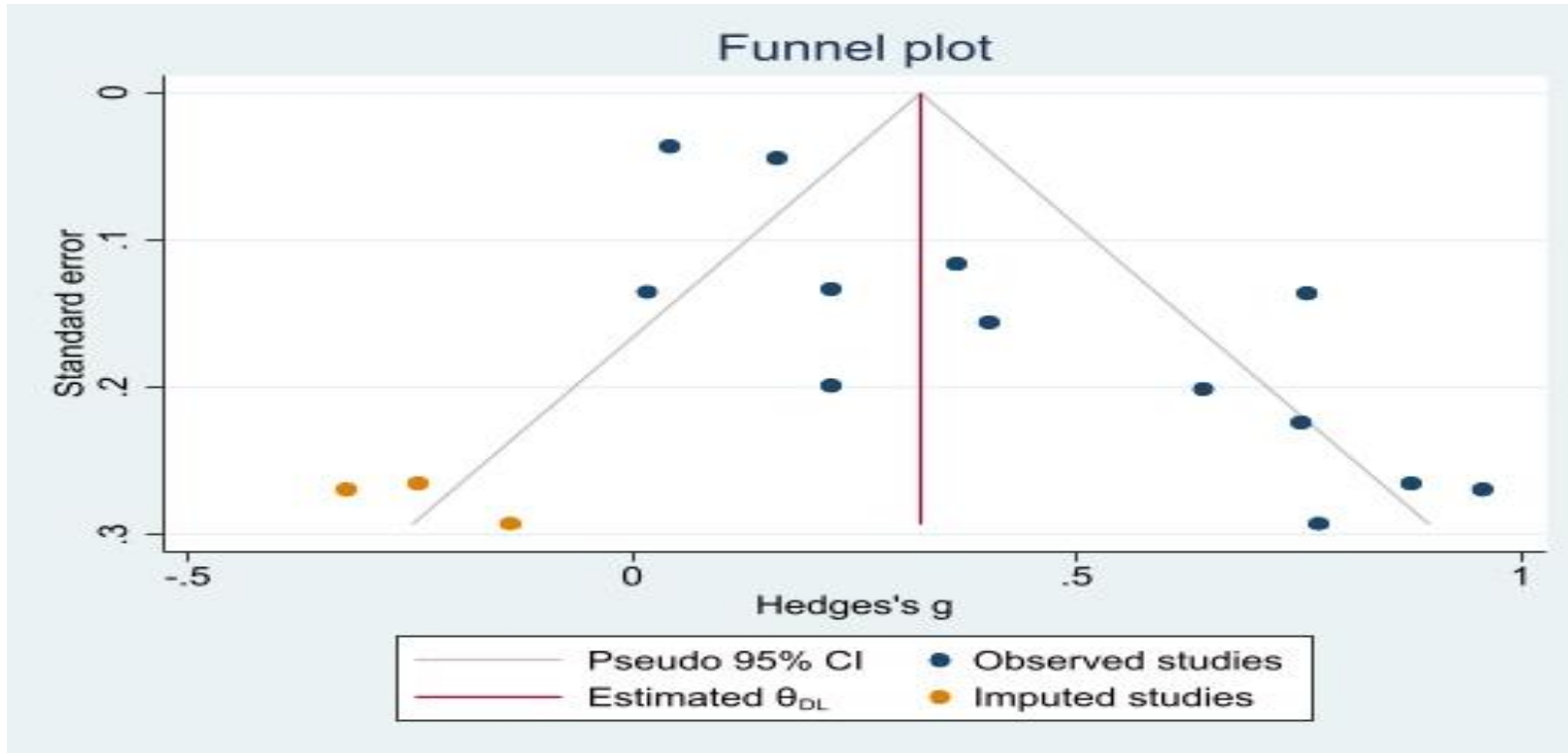
Supplementary Figure 9 Funnel plot of studies for anxiety comparing full term vs preterm birth.



Supplementary Figure 10 Funnel plot of studies for stress comparing full term vs preterm birth.







Supplementary Figure 12 Trim and fill method to correct the effect of small studies.



Number of studies = 9		Root MSE = 2.595				
Std_Eff	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
slope	-.1506333	.5037894	-0.30	0.774	-1.341906	1.040639
bias	4.753178	3.344314	1.42	0.198	-3.154869	12.66122
Test of H0: no small-study effects			P = 0.198			

**Supplementary Figure 14 Egger's test for the studies in meta-analysis for anxiety.**

Number of studies = 6				Root MSE	=	1.279
Std_Eff	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
slope	-.3516043	.2398294	-1.47	0.217	-1.017477	.3142688
bias	5.26971	1.700451	3.10	0.036	.5485029	9.990918
Test of H0: no small-study effects			P = 0.036			

**Supplementary Figure 15 Egger's test for the studies in meta-analysis for stress.**