

Supplementary Materials 1 Study Characteristics and main findings

| First Author           | Year | Country | Study design     | Control Sample | CYP Age in years    | CYP mental health difficulty | Sample size    | % fathers | Measurement tool used     | Main Findings including mean (s.d.) where relevant  |
|------------------------|------|---------|------------------|----------------|---------------------|------------------------------|----------------|-----------|---------------------------|---|
| Acri <sup>40</sup>     | 2016 | USA     | Controlled trial | No             | 7 to 11             | ODD                          | 320            | 9.4%      | PSI-SF                    | Mean 98.6 (22.49)   |
| Aggarwal <sup>41</sup> | 2018 | India   | Cross-sectional  | No             | Mean 15             | CD                           | 32             | unclear   | PSS, HAMA, WSAS           | PSS: mothers 62.63 (16.00), fathers 52.75 (13.9), p=0.01, d=0.66.<br>HAMA: mothers 19.4 (7.29), fathers 10.9 (5.79). p<0.001. d=1.29.<br>WSAS: mothers 21.59 (8.33), fathers 13.78 (7.52), p<0.001, d=0.98. |
| Algorta <sup>42</sup>  | 2018 | UK      | Case-control     | Yes            | Mean 9.4 (s.d. 1.9) | Bipolar                      | 621 (case:149, | unclear   | GBI, Parent Stress Survey | Means - GBI case 36.14 (30.57), control 31.40 (27.27), p=0.07. Parent Stress Survey: Case   |

|                                |      |                 |                     |     |          |           |  |   |                          |   |
|--------------------------------|------|-----------------|---------------------|-----|----------|-----------|--|---|--------------------------|---|
|                                |      |                 |                     |     |          |           | control:<br>491)                         |   | (Sisson & Fristad, 2001) | 24.34 (14.10), control 18.31 (12.64), p<0.01.   |
| CONAlqaht<br>ani <sup>43</sup> | 2020 | Saudi<br>Arabia | Cross-<br>sectional | No  | Up to 18 | Anxiety   | 220                                      | 39.5%   | MCS-12                   | Mean 46.8 (8.9)   |
| Carroll <sup>44</sup>          | 2022 | USA             | Correlational       | No  | 6 to 17  | Psychoses | 56                                       | 16%   | ZBI                      | 27% above cut-off for stress.<br>Mean 38.7 (16.39)  |
| Cooper <sup>45</sup>           | 2006 | UK              | Case-control        | Yes | 6 to 16  | Anxiety   | 215<br>(case:13<br>6,<br>control:<br>79) | 53.7%<br>(case:60<br>%,<br>control:<br>43.0%) | SCID                     | Major depression: case 12.9%<br>mothers, 3.9% fathers, control<br>2.2% mothers, 0% fathers. OR<br>3.64 (95% CI 1.05-64.2).<br>Any anxiety diagnosis: case<br>68.2% mothers, 27.5% fathers,<br>control 26.7% mothers, 14.7%<br>fathers. OR 5.9 (95% CI 1.68-<br>10.43) |
| Costin <sup>46</sup>           | 2004 | Australia       | Comparison<br>two   | No  | 4 to 16  | ODD       | 66                                       | unclear                                       | GHQ-28                   | Mean 29.1 (18.80)   |

| interventions          |      |           |                               |     |          |                   |   |         |                        |   |
|------------------------|------|-----------|-------------------------------|-----|----------|-------------------|---|---------|------------------------|---|
| Derisley <sup>47</sup> | 2005 | UK        | Case-control                  | Yes | 11 to 18 | Anxiety and OCD   | 118 (case 1: 28, case2: 28, control: 62 ) | unclear | BSI                    | OCD group 58.1 (10.18), clinical anxiety group 57.17 (9.69), control group 51.73 (9.41). OCD and clinical anxiety significantly higher than control (d=0.65 and d=0.57 respectively). |
| Duclos <sup>48</sup>   | 2023 | France    | Cross-sectional               | No  | 13 to 21 | Anorexia Nervosa  | 135                                       | 40.7%   | HADS (anxiety), BDI-II | HADS Fathers= 6.94 (3.63); mothers= 9.63 (4.79) p<0.0001, d=0.63.<br>BDI-II: Fathers 8.76 (6.02), Mothers 14.88 (9.71), p=0.08, d=0.76  |
| Farley <sup>49</sup>   | 2023 | Australia | Pilot intervention (pre-post) | No  | 3 to 7   | Anxiety Disorders | 21  | 4.8%    | PSI-SF, BSI            | 57.2 % above cut-off for clinical anxiety   |

|                               |      |     |   |    |          |  |     |       |           |   |   |
|-------------------------------|------|-----|---|----|----------|--|-----|-------|-----------|---|---|
|                               |      |     |   |    |          |  |     |       |           |   | BSI mean 2.91 (1.99). PSI-SF total 95.2 (17.36) |
| Fields <sup>50</sup>          | 2012 | USA | RCT                                       | No | Mean 9.9 | Depressive or bipolar disorders                          | 165 | 6.1%  | HAMD, PDI | Mean HAMD 8.1 (7.5). PDI reveals rate 18% clinical level.   |   |
| Gerken<br>meyer <sup>51</sup> | 2008 | USA | Cross-sectional                           | No | 2 to 19  | Internalizing and externalizing child behaviour problems | 155 | 1%    | CES-D     | Mean 20 (12.62)   |   |
| Halldorsson <sup>52</sup>     | 2018 | UK  | Cross-sectional, two CYP diagnosis groups | No | 7 to 12  | Anxiety (Social anxiety = SA and other anxiety = OA)     | 647 | 42.1% | DASS      | Depression means SA 8.39 (7.75), OA 6.06 (7.16); Anxiety means SA 5.31 (6.15), OA 3.66 (5.11); general stress means SA 13.19 (8.33), OA 11.12 (8.45). |   |
| Hamovitch <sup>10</sup>       | 2019 | USA | Cross-sectional                           | No | 7 to 10  | ODD  | 213 | 38%   | CES-D-SF  | Mean 7.68 (5.64)  |   |

|                  |      |       |                            |     |         |     |                             |   |               |   |
|------------------|------|-------|----------------------------|-----|---------|-----|-----------------------------|---|---------------|---|
| He <sup>53</sup> | 2020 | China | Case-control, longitudinal | Yes | 4 to 11 | ODD | 521 (case control 256, 265) | unclear                                       | PSI-SF, CES-D | PSI: Parent distress - Case 33.56 (7.41); control 31.70 (7.22) p=0.0039, d=0.36. Parent-child - Case 28.01 (7.65); control 24.76 (6.97), p=0.0001, d=0.66. Difficult child – Case 33.90 (8.69); control 28.81 (8.32), p=0.0001, d=0.87. CES-D: Case: 10.07 (7.61) Control 8.00 (6.41). p=0.0008, d=0.33 |
| He <sup>54</sup> | 2021 | China | longitudinal               | No  | 6 to 13 | ODD | 370                         | 41.9% (155/370 reported fathers, 28 of sample | CES-D         | Mean 13.30 (8.28)   |

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|                        |      |           |                           |    |           |  |              |         | did not report) |   |  |
| Johnco <sup>11</sup>   | 2021 | Australia | Cross-sectional           | No | Mean 11.2 | Depression and anxiety                   | 531 families | 4.14%   | DASS            | Mean 2.33 (3.66)  |  |
| Lebowitz <sup>55</sup> | 2020 | USA       | Randomized Noninferiority | No | 7 to 14   | Anxiety                                  | 124 families | unclear | PSI             | Mean 133.6 (20.6)   |  |
| Lim <sup>56</sup>      | 2021 | Korea     | Cross-sectional           | No | 5 to 7    | Internalizing and externalizing problems | 1358         | 50%     | K6              | Mean fathers 10.96 (3.94), mothers 11.54 (4.35). p=0.0003, d=0.14               |  |
| Ozyurt <sup>57</sup>   | 2016 | Turkey    | RCT                       | No | 8 to 12   | Anxiety                                  | 50           | unclear | GHQ-28, STAI    | Mean STAI-State 36.08 (7.00), STAI-Trait 43.23 (9.28), GHQ28 Total: 4.62 (5.39) |  |
| Poole <sup>58</sup>    | 2018 | Australia | RCT                       | No | 12 to 17  | Depressive disorder                      | 64 families  | 16.6%   | DASS-21         | Mean 6.47 (7.40)  |  |

|                         |      |           |                           |    |              |                     |             |                         |        |  |
|-------------------------|------|-----------|---------------------------|----|--------------|---------------------|-------------|-------------------------|--------|--|
| Racey <sup>59</sup>     | 2018 | UK        | Mixed method, feasibility | No | 14 to 18     | Depression          | 29          | 0%                      | BDI-II | Mean 8.6 (7.7)   |
| Schwarte <sup>60</sup>  | 2017 | Germany   | Cross-sectional           | No | 11 to 18     | Anorexia nervosa    | 296         | 82.9%                   | BDI-II | Mean 6.15 (3.99)   |
| Sengupta <sup>61</sup>  | 2017 | India     | Cross-sectional           | No | Not reported | Psychiatric         | 100         | 50%                     | HDRS   | Above cut-off for mild depression 88% mothers, 56% fathers. OR 5.76 (95% CI 2.08-15.97), p=0.0008. |
| Settipani <sup>62</sup> | 2013 | USA       | Cross-sectional           | No | 7 to 14      | Anxiety             | 111         | focused only on mothers | STAI   | STAI-State: 29.53 (10.18). (Trait not measured)  |
| Stewart <sup>63</sup>   | 2019 | UK        | Pilot                     | No | Mean 15.6    | Bulimia nervosa     | study 1: 34 | unclear                 | HADS   | Mean: 6.15 (3.99)  |
| Sung <sup>64</sup>      | 2019 | Singapore | Cross-sectional           | No | 6 to 19      | Depression/ anxiety | 58          | 32.8%                   | ASR    | Above clinical level for anxiety – 4.5% mothers, 0% fathers.                                       |





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Mothers: Case (n=46) 99.2  
(21.3), Control (n=35) 90.8  
(14.2)

Fathers: Case (n=36) 92.8  
(21.3), control (n=24) 90.8  
(17.2)

Case: mothers compared  
fathers  $p=0.1807$ ,  $d=0.30$ .

BDI: Case: Mothers  $n=46$ , 10.02  
(8.52). Fathers  $n=36$  7.33  
(8.17).  $p=0.15$ ,  $d=0.32$ . Control:  
Mothers  $n=36$  6.89 (5.35),  
Fathers  $n=24$  7.50 (7.52). Case  
mothers significantly worse  
than control mother scores,  
case fathers n.s. to control  
fathers.

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| Timmer <sup>66</sup>    | 2019 | USA       | RCT  | No | 1 to 10      | Externalizing<br>behaviour | 59                           | unclear                        | PSI                                  | Mean Parent<br>distress<br>56.2<br>(26.7) – normal range<br>Parent-child<br>dysfunction<br>61.1<br>(26.7) – normal<br>Difficult Child<br>76.5 (25.1) –<br>normal |
| Truttmann <sup>67</sup> | 2020 | Austria   | Quasi-<br>randomised<br>feasibility<br>trial | No | Mean<br>14.7 | Anorexia Nervosa           | 102                          | 14%<br>(gender)                | GHQ12,<br>SCL-90,<br>BDI-II,<br>STAI | Means GHQ-12<br>4.7 (3.47),<br>SCL-90 = 0.43<br>(0.39), BDI-II<br>10.86 (7.02),<br>STAI state<br>47.71<br>(10.66), STAI<br>trait 41.49<br>(9.41)                 |
| Wilksch <sup>68</sup>   | 2023 | Australia | Repeated<br>measures                         | No | <18          | Eating disorder            | 372                          | unclear                        | DASS-21                              | 34.3% above<br>clinical<br>cut-off.<br>Mean 16.41<br>(10.30)   |
| Zeiler <sup>69</sup>    | 2023 | Austria   | Cross-<br>sectional                          | No | 10 to 23     | anorexia nervosa           | 248<br>(across 3<br>cohorts) | 59%-69%<br>across 3<br>cohorts | GHQ12,<br>BDI-II,<br>STAI            | Means STAI<br>state 45.4<br>(11.83),<br>STAI trait<br>40.4 (10.37),<br>BDI-II<br>11.1 (8.01),<br>GHQ12: 4.8<br>(3.63)  |

Abbreviations: ASR – Adult Self Report; BDI – Beck Depression Inventory; BDI-II – Beck Depression Inventory version 2; BSI – Beck Symptoms Inventory; CES-D: Centre for Epidemiological Studies Depression Scale ; CES-D-SF: Centre for epidemiological Studies Depression short form; DASS: Depression Anxiety Stress Scale; DASS-21: Depression Anxiety Stress Scale 21 items; GBI: ; GHQ28: General Health Questionnaire 28 items;

GHQ12: General Health Questionnaire 12 items; HADS: Hospital Anxiety and Depression Scale ;HAMA: Hamilton Anxiety Rating Scale; HAMD: Hamilton Depression Rating Scale; HDRS: Hamilton Depression Rating Scale; K6: Kessler Psychological Distress Scale; MCS-12: Mental health component scale of the 12-item Short Form ; PDI: Psychiatric Diagnostic Interview ;PSI: Parenting Stress Index; PSI-SF: Parenting Stress Index Short Form; PSS: Parental Stress Scale; SCID: Structured Clinical Interview for DSM Disorder ; SCL-90: Symptom Checklist 90; STAI: State Trait Anxiety Inventory ; WSAS: the Work and Social Adjustment Scale; ZBI: Zarit Burden Inventory

## Appendix 1: Full searches for Research question 1

### Medline

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| S1 | TI ((parent or parents or parental or mother or father or care*giver or guardian* or carer* or paternal or maternal) ) OR AB ( ( parent or parents or parental or mother or father or care*giver or guardian* or carer* or paternal or maternal ) ) OR MM ("Parents+")   |
| S2 | TI ( (children or adolescent* or adolescence or youth* or child or teenager* or pediatric* or paediatric* or kid* or teen* or young person or young people or boy* or girl* or juvenile* ) ) OR AB ( ( children or adolescent* or adolescence or youth* or child or teenager* or pediatric* or paediatric* or kid* or teen* or young person or young people or boy* or girl* or juvenile* ) ) OR MH ("Child+") OR MM ("Adolescent")  |
| S3 | ( TI ( ( attention deficit disorder* or “attention deficit hyperactive disorder* “or “ADHD”) OR AB (attention deficit disorder* or “attention deficit hyperactive disorder* “or “ADHD”) OR MH (“Attention Deficit Disorder with Hyperactivity”) OR ( TI ( (Eating disorder* or anorexia or bulimia or eating problem*) ) OR AB ( (Eating disorder* or anorexia or bulimia or eating problem*) OR MH(“Feeding and Eating Disorders+”) OR ( TI ( (Emerging personality disorder* or emerging personality problem*) ) OR AB ( (Emerging personality disorder* or emerging personality problem*) ) OR MH (“Personality Disorder+”) ) OR ( TI ( (Externalising disorder* or externalising problem* or externalizing disorder* or externalizing problem*) OR AB (Externalising disorder* or externalising problem* or externalizing disorder* or externalizing problem*) OR TX (“Externalising disorder”) ) OR ( TI ( (Oppositional defiant disorder* or oppositional defiant problem*) ) OR AB ( (Oppositional defiant disorder* or oppositional defiant problem*) OR (MH“Attention Deficit and Disruptive Behavior Disorders+”) ) OR ( TI ( (Psychos* or psychotic disorder* or psychotic problem*) ) OR AB ( (Psychos* or psychotic disorder* or psychotic problem*) ) OR MH (“Psychotic Disorders+”) ) OR ( TI ( ( Anxiety or depression or depressive or “obsessive compulsive disorder” or “OCD” or phobia or phobic or mood disorder or anxiety disorder or panic disorder or agoraphobia or internalising problem* or internalising problem* or internalizing problem* or internalizing disorder* ) ) OR AB ( ( Anxiety or depression or depressive or “obsessive compulsive disorder” or “OCD” or phobia or phobic or mood disorder or anxiety disorder or panic disorder or agoraphobia or internalising problem* or internalising problem* or internalizing problem* or internalizing disorder* ) OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major") OR (MH "Depressive Disorder, Treatment-Resistant") OR (MH "Dysthymic Disorder") OR (MM "Anxiety Disorders+”) ) |
| S4 | TI (“Information need*” or “knowledge need*” or need* or support or experience* or impact or wellbeing or concern* or want or perspective* or belief* or attitude* or prefer* or anxiety or anxious or depressed or depression or strain or stress or burden or “parent satisfaction” or “family relationship” or “parent* self-efficacy”) OR AB (“Information need*” or “knowledge need*” or need* or support or experience* or impact or wellbeing or concern* or want or perspective* or belief* or attitude* or prefer* or anxiety or anxious or depressed or depression or strain or stress or burden or “parent satisfaction” or “family relationship” or “parent* self-efficacy”))  |
| S5 | S1 N8 S4   |
| S6 | S2 N8 S3   |
| S7 | S5 AND S6 (English date limitation applied)  |

### PsycInfo, EMBASE, AMED, CINAHL

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| S1 | (parent or parents or parental or mother or father or care*giver or guardian* or carer* or paternal or maternal).ab. or (parent or parents or parental or mother or father or care*giver or guardian* or carer* or paternal or maternal).ti. or parents.kw. |
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| S2 | (children or adolescent* or adolescence or youth* or child or teenager* or pediatric* or paediatric* or kid* or teen* or young person or young people or boy* or girl* or juvenile*).ab. or (children or adolescent* or adolescence or youth* or child or teenager* or pediatric* or paediatric* or kid* or teen* or young person or young people or boy* or girl* or juvenile*).ti. or (child or adolescent).kw.   |
| S3 | (attention deficit disorder* or attention deficit hyperactive disorder* or ADHD or Eating disorder* or anorexia or bulimia or eating problem* or Emerging personality disorder or emerging personality problem* or Externalising disorder* or externalising problem* or externalizing disorder* or externalizing problem* or Oppositional defiant disorder* or oppositional defiant problem* or Psychos* or psychotic disorder* or psychotic problem* or Anxiety or depression or depressive or obsessive compulsive disorder or OCD or phobia or phobic or mood disorder or anxiety disorder or panic disorder or agoraphobia or internalising problem* or internalising problem* or internalizing problem* or internalizing disorder*).ab. or (attention deficit disorder* or attention deficit hyperactive disorder* or ADHD or Eating disorder* or anorexia or bulimia or eating problem* or Emerging personality disorder or emerging personality problem* or Externalising disorder* or externalising problem* or externalizing disorder* or externalizing problem* or Oppositional defiant disorder* or oppositional defiant problem* or Psychos* or psychotic disorder* or psychotic problem* or Anxiety or depression or depressive or obsessive compulsive disorder or OCD or phobia or phobic or mood disorder or anxiety disorder or panic disorder or agoraphobia or internalising problem* or internalising problem* or internalizing problem* or internalizing disorder*). |
| S4 | (information need* or knowledge need* or need* or support or experience* or impact or wellbeing or concern* or want or perspective* or belief* or attitude* or prefer* or anxiety or anxious or depressed or depression or strain or stress or burden or parent satisfaction or family relationship or parent* self-efficacy).ab. or (information need* or knowledge need* or need* or support or experience* or impact or wellbeing or concern* or want or perspective* or belief* or attitude* or prefer* or anxiety or anxious or depressed or depression or strain or stress or burden or parent satisfaction or family relationship or parent* self-efficacy).ti.  |
| S5 | S1 adj8 s4  |
| S6 | S2 adj8 s5  |
| S7 | S5 and s6   |

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| #3 | TS=('attention deficit disorder*' OR 'attention deficit hyperactive disorder*' OR adhd OR 'attention deficit disorder with hyperactivity' OR 'Eating disorder* or anorexia or bulimia' OR 'eating problem*' OR 'feeding and eating disorders' OR 'emerging personality disorder*' OR 'emerging personality problem*' OR 'personality disorder' OR 'externalising disorder*' OR 'externalising problem*' OR 'externalizing disorder*' OR 'externalizing problem*' OR 'oppositional defiant disorder*' OR 'oppositional defiant problem*' OR 'attention deficit and disruptive behavior disorders' OR psychos* OR 'psychotic disorder*' OR 'psychotic problem*' OR anxiety OR depression OR depressive OR 'obsessive compulsive disorder' OR 'ocd' OR phobia OR phobic OR 'mood disorder' OR 'anxiety disorder' OR 'panic disorder' OR agoraphobia OR 'internalising problem*' OR 'internalising disorder*' OR 'internalizing problem*' OR 'internalizing disorder*') |

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| #4 | TS=(“Information need*” or “knowledge need*” or need* or support or experience* or impact or wellbeing or concern* or want or perspective* or belief* or attitude* or prefer* or anxiety or anxious or depressed or depression or strain or stress or burden or “parent satisfaction” or “family relationship” or “parent* self-efficacy” )  |
| #5 | TS=((parent OR parents OR parental OR mother OR father OR care*giver OR guardian* OR carer* OR paternal OR maternal) NEAR/8 (“Information need*” or “knowledge need*” or support or experience* OR impact* or wellbeing or concern* or want or perspective* or belief* or attitude* or prefer* or anxiety or anxious or depressed or depression or strain or stress or burden or “parent satisfaction” or “family relationship” or “parent* self-efficacy”))   |
| #6 | TS=(("attention deficit disorder" or "attention deficit hyperactive disorder" or adhd or "attention deficit disorder with hyperactivity" or "eating disorder" or "eating problem" or "feeding and eating disorder" or "emerging personality disorder" or "emerging personality problem" or "personality disorder" or "externalising disorder" or "externalising problem" or "oppositional defiant disorder" or "oppositional defiant problem" or "attention deficit and disruptive behavior disorders" or psychos* or "psychotic" or anxiety or depression or depressive or anxious or "obsessive compulsive disorder" or OCD or phobia or phobic or "mood disorder" or "anxiety disorder" or "panic disorder" or agoraphobia or "internalising problem" or "internalising disorder" or "internalizing problem" or "internalizing disorder" or "externalizing problem" or "externalizing disorder") NEAR/8 (children or adolescent* or adolescence or youth* or child or teenager* or pediatric* or paediatric* or kid* or teen* or "young person" or "young people" or boy* or girl* or juvenile*)) |
| #7 | #5 AND #6  |
| #8 | #7 English   |

#### Cochrane Library

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| #3 | 'attention deficit disorder*' OR 'attention deficit hyperactive disorder*' OR adhd OR 'attention deficit disorder with hyperactivity' OR 'Eating disorder* or anorexia or bulimia' OR 'eating problem*' OR 'feeding and eating disorders' OR 'emerging personality disorder*' OR 'emerging personality problem*' OR 'personality disorder' OR 'externalising disorder*' OR 'externalising problem*' OR 'externalizing disorder*' OR 'externalizing problem*' OR 'oppositional defiant disorder*' OR 'oppositional defiant problem*' OR 'attention deficit and disruptive behavior disorders' OR psychos* OR 'psychotic disorder*' OR 'psychotic problem*' OR anxiety OR depression OR depressive OR 'obsessive compulsive disorder' OR 'ocd' OR phobia OR phobic OR 'mood disorder' OR 'anxiety disorder' OR 'panic disorder' OR agoraphobia OR 'internalising problem*' OR 'internalising disorder*' OR 'internalizing problem*' OR 'internalizing disorder* |
| #4 | “Information need*” or “knowledge need*” or need* or support or experience* or impact or wellbeing or concern* or want or perspective* or belief* or attitude* or prefer* or anxiety or anxious or depressed or depression or strain or stress or burden or “parent satisfaction” or “family relationship” or “parent* self-efficacy”   |
| #5 | #1 and #2 and #3 and #4   |

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| #1 | parent OR parents OR parental OR mother OR father OR caregiver OR guardian* OR carer* OR paternal OR maternal |
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| #2 | children OR adolescent* OR adolescence OR youth* OR child OR teenager* OR pediatric* OR paediatric* OR kid* OR teen* OR 'young person' OR 'young people' OR boy* OR girl* OR juvenile*   |
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| #5 | #1 and #2 and #3 and #4  |

**Table 1: Cut-off points to indicate normal, elevated, or clinical ranges of outcome measures used in included studies**

| Measure Abbreviation | Measure Name   | Variable measured   | Score Range           | Cut-off point   | Reference   |
|----------------------|--|---|-----------------------|---|---|
| ASR                  | Adult Self-Report from the Achenbach System of Empirically Based Assessments | Anxiety, depression, and personality problems – somatic, avoidant and antisocial. | 0-240 for total score | The thresholds for clinical and subclinical scores for the ABCL and ASR correspond to the 97th and 93rd percentiles.  | Achenbach T.M., Rescorla L.A. Manual for the ASEBA Adult Forms & Profiles. University of Vermont, Research Center for Children, Youth, & Families; Burlington, VT, USA: 2003  |
| BDI                  | Beck Depression Inventory (original 1961 measure)                            | Depression  | 1 to 42               | 1-10:Normal<br>11-16:Mild<br>17-20 :Borderline clinical depression<br>21-30: Moderate<br>31-40 :Severe<br>40+: Extreme<br><br>The cut-off also used in the Turkish version, seen in Karacan, F. A., Yilmaz, S., & Kara, T. (2022). The Mental Health and Marital Adjustment of Mothers of Children with Attention Deficit Hyperactivity Disorder. 60(3), pp. 220-227. | Beck At, Ward Ch, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry 1961;4:561-71.   |
| BDI-II               | BDI-II   | Depression  | 0 to 63               | 0-13 – minimal<br>14-19 – mild<br>20-28 – moderate<br>29 – 63 - severe  | Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. (1996). Comparison of Beck Depression Inventories -IA and -II in psychiatric outpatients. Journal of Personality Assessment, 67, 588–597.<br>10.1207/s15327752jpa6703. |



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|---------|---|-----------------------------|-----------------------------------|---|--|--|--|
|         |   |                             |                                   |   |  |  |  |
| BSI     | Brief Symptom Inventory                             | Distress                    | Each subscale (T-score): 0 to 100 | <p><b>T[two scales] or GSI (Global severity index) t-scores:</b><br/>         &lt; 60: "no distress"<br/>         ≥ 60 and &lt; 63: "mild distress"<br/>         ≥ 63 and &lt; 70: "remarkable distress"<br/>         ≥ 70: "severe distress"</p> <p><b>PSDI (Positive symptom distress index) t-scores:</b><br/>         &lt; 49: "no distress"<br/>         ≥ 49 and &lt; 60: "mild distress"<br/>         ≥ 60 and &lt; 70: "remarkable distress"<br/>         ≥ 70: "severe distress"</p> <p><b>PST (Positive symptom total) t-scores:</b><br/>         &lt; 47: "no distress"<br/>         ≥ 47 and &lt; 57: "mild distress"<br/>         ≥ 57 and &lt; 69: "remarkable distress"<br/>         ≥ 69: "severe distress"</p> |  |  | (Derogatis & Melisaratos, 1983)<br>(Derogatis, 1993)<br>(Helga et al., 2021) |
| CES-D   | Centre for Epidemiological Studies Depression Scale | Depression                  | 0 to 60                           | 16+: Clinically significant depressive symptoms   |  |  | (Hann D. et al., 1999)<br>(Radloff, 1977)                                    |
| DASS-42 | Depression Anxiety Stress Scale                     | Depression, anxiety, stress | Each subscale: 0 to 42            | Depression:<br>0-9: Normal<br>10-13: Mild<br>14-20: Moderate<br>21-27: Severe<br>+ 28: Extremely severe   | Anxiety<br>0-7: Normal<br>8-9: Mild<br>10-14: Moderate<br>15-19: Severe<br>20+: Extremely Severe | Stress<br>0-14: Normal<br>15-18: Mild<br>19-25: Moderate<br>26-33: Severe<br>34+ :Extremely Severe | (Lovibond & Lovibond, 1995)  |

|         |  |                             |                        |   |  |  |  |
|---------|--|-----------------------------|------------------------|---|--|--|--|
| DASS-21 | Depression Anxiety Stress Scale – 21 items (Short version) | Depression, anxiety, stress | Each subscale: 0 to 21 | Depression:<br>0-4: Normal<br>5-6: Mild<br>7-10: Moderate<br>11-13: Severe<br>+ 14: Extremely severe  | Anxiety<br>0-3: Normal<br>4-5: Mild<br>6-7: Moderate<br>8-9: Severe<br>10+: Extremely Severe | Stress<br>0-7 Normal<br>8-9 Mild<br>10-12 Moderate<br>13-16: Severe<br>17+: Extremely Severe | (Henry JD & JR, 2005)  |
| GBI     | General Behavior Inventory (Depue et al., 1982)            |                             |                        | Depression – 22+<br>Hypomania – 13+   |  |  | (RL et al., 2002)  |
| GHQ-12  | GHQ (short version 12 items)                               | Psychological disorder      | 0 to 36                | <b>Cut-off threshold to identify “caseness” (ratio between experiment group scores and control group scores)</b><br>$< 2/3 = 0.666$ : case of psychological disorder<br><br><b>Raw scores:</b><br>Women:<br>$< 3$ Non-cases<br>Men<br>$< 3$ Non-cases |  |  | (Anjara et al., 2020; Goldberg D. P. et al., 1998)                                     |
| GHQ-28  | GHQ (short version 28 items)                               | Psychological disorder      | 0 to 84                | <b>Total scores:</b><br>- 23: Non-psychiatric<br>+ 24: Psychiatric<br><br><b>Threshold for subscales:</b><br>Low: 1/2<br>Mid: 2/3<br>High : 3/4 - 6/7<br><br>Alternatively - “sten scores” 6 or more indicative of clinical difficulties.             |  |  | (Hjelle Ellen G. et al., 2019; Willmott Sasi A. et al., 2004)<br>(Pisula et al., 2019) |
| HADS    | Hospital and Anxiety and Depression Scale                  | Anxiety and depression      | 0 to 21                | 0-7: Normal<br>8-10: Mild   |  |  | (A.S Zigmond & Snaith, 1983)   |

|                           |   |                  |                        |  |   |
|---------------------------|---|------------------|------------------------|--|---|
|                           |   |                  |                        | 11-14 Moderate<br>15-21 Severe   |   |
| HAMA / HARS               | The Hamilton Anxiety Scale                  | Anxiety          | 0 to 56                | <17: Mild<br>18-24: Mild to moderate<br>25-30: Moderate to severe  | (W Maier et al., 1988)  |
| HAMD / HDRS               | The Hamilton Depression Scale               | Depression       | 0 to 29                | 0-7: Normal<br>8-13: Mild<br>14-18: Moderate<br>19-22: Severe<br>>23: Very severe  | (E Frank et al., 1991)  |
| HRSD-24 / HAMD24          | Hamilton Depression Scale - 24              | Depression       | 0 to 72                | < 8: no depression<br>8-19: mild depression<br>20-34: moderate depression<br>≥ 35: severe depression   | (Li et al., 2020)   |
| K6                        | Kessler 6                                   | Depression       | 0 to 24                | 5 +: Moderate<br>13 +: Clinical  | (Ronald C. Kessler et al., 2003)  |
| MCS-12                    | Mental health component of the SF-12        | Mental wellbeing | 0 to 100               | < 42: Clinical depression  | (Ware et al., 1995)   |
| PSI-SF (36 item versions) | Short version of the PSI                    | Stress           | 36 to 180 <sup>1</sup> | <b>Using percentile scores</b><br>Parental distress: Typical 15-80; high stress 81-89; clinically significant stress 90-100<br>Parent-Child Dysfunctional interaction: Typical 5-80; high 81-84; clinically significant 85-100<br>Difficult child: 15-80; 81-89; 90-100<br>Total stress: 15-80; 81-89; 90-100<br><br><b>Raw scores (clinical cutoff)</b><br>Parental distress: > 33<br>Parent-Child Dysfunctional interaction: > 27<br>Difficult child: > 33<br>Total stress: > 90 | (Abidin, R. R., 1990)<br>(Dardas & Ahmad, 2014)   |
| PSI4-SF                   | Parenting Stress Index Short Form version 4 | Stress           | T-scores: 20 to 100    | T-scores:<br>< 62 within normal limits<br>> 66 clinically significant  | <a href="https://www.tricare-west.com/content/dam/hnfs/tw/prov/resource">https://www.tricare-west.com/content/dam/hnfs/tw/prov/resource</a> |

<sup>1</sup> Range of scores is taken from sum of the 3 subscales

|          |                                      |                              |   |   |   |
|----------|--------------------------------------|------------------------------|---|---|---|
|          |                                      |                              |   |   | s/pdf/ACD%20PSI%20Provider%20education.pdf  |
| PSS      | Parental Stress Scale                | Stress                       | 0 to 40   | Men cut-off: 24.0<br>Women cut-off: 25.6<br><br>Aggarwal paper has “severity of stress is rated as: Mild – 18 to 42; Moderate– 43 to 66; Severe – 67 to 90” with the scale going from 18-90 – see <a href="#">A Comparative Study of Stress, Anxiety &amp; Work Impairment in Parents of Children with Conduct Disorder (sagepub.com)</a> | (Judy O. Berry & Jones, 1995)   |
| SCL-90-R | Symptom Check-List-90-R (SCL-90-R)   | Overall mental health        | Mean of item scores 0-4.                        | German version used in included study.<br>Cut-off for Global scale 0.5 indicates clinical difficulties  | Schmitz, N., N. Hartkamp, J. Kiuse, G. H. Franke, G. Reister, & W. Tress. (2000). The Symptom Check-List-90-R (SCL-90-R): A German Validation Study. <i>Quality of Life Research</i> , 9(2), 185–193. <a href="http://www.istor.org/stable/4036992">http://www.istor.org/stable/4036992</a> |
| STAI     | State-trait anxiety inventory        | Anxiety (syndrome and trait) | 20 to 80  | Trait scale:<br>> 40 high anxiety traits<br>State scale:<br>> 40 high anxiety symptoms  | (Addolorato et al., 1999)   |
| WSAS     | The Work and Social Adjustment Scale | Impairment in functioning    | 0 to 40   | 0-9: Low impairment<br>10-19: Moderate impairment<br>20-40 Severe impairment  | (James C Mundt et al., 2002)  |
| ZBI      | Zarit Burden Inventory               | Burden                       | <b>22 item:</b><br>0 to 88<br><br><b>Short:</b> | <b>Revised version:</b><br>0-21: No to mild burden<br>21-40: Mild to moderate Burden<br>41-60: Moderate to severe burden  | (S. H Zarit et al., 1980)<br>(Naser Al-Balushi et al., 2019)  |

**Commented [SW1]:** Website with information on scoring and results interpretation

|  |  |  |                           |  |  |
|--|--|--|---------------------------|--|--|
|  |  |  | 0 to 48                   | 61+: Severe burden   |  |
|  |  |  | <b>Screen:</b><br>0 to 16 | <b>Short version:</b><br>0-10: No to mild burden<br>10-20: Mild to moderate burden<br>20+: High burden |  |
|  |  |  |                           | <b>Screen version:</b><br>8+: High burden  |  |

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### Supplementary Materials 3: Approach to study quality appraisal and results

The approach to study quality appraisal is set out below, with the criteria detailed in Table S3.1 and the appraisal results in Table S3.2.

The scale covers three areas: selection of participants; comparability of case-control groups (where relevant); and exposure to the issue of interest.<sup>1</sup> Each area has items that are scored with a star if criteria are met. This tool is commonly used to appraise quality in observational studies, and has versions for case-control and cohort studies, sometimes used for cross-sectional designs.<sup>2,3</sup> The scale is modifiable<sup>3</sup>. Our review includes a range of study designs, including cross-sectional, case-control, and intervention studies. However, our core research question relates to establishing the levels of our variables in our population at baseline”, rather than evaluating any type of intervention or longitudinal changes. As such, based on the originals and a version developed for cross-sectional studies<sup>4</sup>, we made modifications to increase relevance to our review. Modifications were made to specify what constitutes being a representative sample of cases and clarification regarding ascertainment of exposure (here exposure to CYP with a mental health condition). The details of comparability were expanded to allow evaluation not only of case-control designs, but also for cross-sectional designs around whether important confounding variables were considered. Given that our interest is not in repeated measures, follow-up considerations were altered to consider statistical testing and data completion. The criteria are detailed below in Table S3.1 and related to 1) selection of participants as representative, appropriate control group where included, how exposure to CYP mental health difficulties was ascertained, and definition of any control group; 2) comparability both in terms of comparison to any control group but also exploring within a sample the relevance of important factors such as presence of fathers in the sample and ethnic diversity; and 3) outcome assessment, testing and reporting of missing data. If the study provided acceptable evidence of the criteria, it was scored “\*” and allocated a point. Otherwise the study scored “U” for unacceptable or “N/A” where the criteria was not relevant to that study. The maximum points available is nine, as in the original tool.

**Table S3.1: Study quality appraisal criteria and scoring details**

| Criteria  | Acceptable - scored “*”  | Unacceptable – scored “U”  |
|---|--|--|
| <b>Selection: Representative of the (exposed) sample</b>  | Truly or somewhat representative – either statistically representative or drawn from an appropriate pool, e.g., parents of CYP who are attending services. | Intervention sample – whereby the characteristics and distress in parents taking part in an intervention may be different to the general parent population (e.g., worse therefore feeling need to attend intervention).<br>Selected convenience sample<br>No details given |
| <b>Selection: Selection of non-exposure cohort</b><br><br><b>N.B. N/A for designs other than case-control</b> | Drawn from same / similar community as the exposed cohort  | Drawn from a different cohort (e.g., parents in control group from a different ethnic group).<br>No description given (where a case-control study).  |
| <b>Selection: Ascertainment of exposure</b>   | Clinical records revealing diagnosis of CYP mental health condition.<br>And/or   | Self-reported symptoms of distress, not in relation to clinical diagnosis  |



|   |  |   |
|---|--|---|
|   | Researchers used validated method (e.g., structured clinical interview, appropriate screening tool) to confirm diagnosis of CYP mental health condition  | No information provided   |
| Selection: Definition of controls   | CYP has no clinical records of distress and is not involved in clinical services or seeking support<br>Self-report by parent and/or CYP (e.g., CYPs have completed a screening measure for the mental health condition of interest). | Assumed no clinical diagnosis without recording any attempts to ascertain this<br>No information provided |
| <b>Comparability:</b><br><b>Maximum two stars</b><br><br><i>N.B. may N/A where study sample is highly focused on e.g., mothers of CYP with specific diagnosis</i> | One star: Study controls for or analyses in relation to main factor: parents' gender.<br><br>Additional star: Study controls for additional relevant factor (e.g., parents' ethnicity).  | Study does not control for any relevant factors.  |
| <b>Outcome: Assessment of outcome</b><br><br><b>N.B. this is an eligibility for inclusion criterion</b>   | Clear outcomes are reported using validated measure with cut-off, or with comparison to control group.   | No validated measures used.<br>No outcome reported.   |
| <b>Outcome: Statistical test</b>  | Appropriate statistical test is used to describe the level of the observed variable in the sample, presented with appropriate confidence intervals / p-value.  | Statistical test not appropriate.<br>No statistical test described.                                       |
| <b>Outcome: None responses / incomplete data</b>  | Missing data were justified (e.g., reasons for none responses or reasons for participant withdrawal provided).   | Missing data was not justified or no clear statement about missing data presented.                        |

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**Table S3.2. The results of the study quality appraisal**

| Study First Author | Selection: Representative of the (exposed) sample | Selection: Selection of non-exposure cohort | Selection: Ascertainment of exposure | Selection: Definition of controls | Comparability: | Outcome: Assessment of outcome | Outcome: Statistical test | Outcome: None responses incomplete data | Total /9 |
|--------------------|---|---|--------------------------------------|-----------------------------------|----------------|--------------------------------|---------------------------|---|----------|
| Acri               | *   | *   | *                                    | NA                                | U              | *                              | *                         | *                                       | 6        |
| Aggarwal           | *   | NA  | *                                    | NA                                | *              | *                              | *                         | NA                                      | 5        |
| Algorta            | *   | *   | *                                    | U                                 | U              | *                              | *                         | NA                                      | 5        |
| Alqahtani          | *   | NA  | U                                    | NA                                | **             | *                              | *                         | NA                                      | 5        |
| Carroll            | *   | NA  | *                                    | NA                                | U              | *                              | U                         | NA                                      | 3        |
| Cooper             | *   | U   | *                                    | *                                 | *              | *                              | *                         | *                                       | 7        |
| Costin             | U   | NA  | *                                    | NA                                | U              | *                              | *                         | *                                       | 4        |
| Derisley           | *   | U   | *                                    | NA                                | U              | *                              | *                         | NA                                      | 4        |
| Duclos             | *   | NA  | *                                    | NA                                | *              | *                              | *                         | *                                       | 6        |
| Farley             | U   | NA  | *                                    | NA                                | U              | *                              | *                         | *                                       | 4        |
| Fields             | U   | NA  | *                                    | NA                                | U              | *                              | *                         | NA                                      | 3        |
| Gerkenmeyer        | U   | NA  | *                                    | NA                                | **             | *                              | *                         | *                                       | 6        |
| Halldorsson        | *   | NA  | *                                    | NA                                | *              | *                              | *                         | *                                       | 6        |
| Hamovitch          | *   | NA  | U                                    | NA                                | U              | *                              | *                         | *                                       | 4        |
| He, 2020           | U   | U   | *                                    | *                                 | **             | *                              | *                         | *                                       | 7        |
| He, 2021           | U   | NA  | *                                    | NA                                | U              | *                              | *                         | NA                                      | 3        |
| Johnco             | *   | NA  | U                                    | NA                                | U              | *                              | *                         | *                                       | 4        |
| Lebowitz           | *   | NA  | *                                    | NA                                | U              | *                              | *                         | *                                       | 5        |
| Lim                | *   | NA  | U                                    | NA                                | *              | *                              | *                         | NA                                      | 4        |
| Ozyurt             | *   | NA  | *                                    | NA                                | U              | *                              | *                         | *                                       | 5        |
| Poole              | *   | NA  | *                                    | NA                                | U              | *                              | *                         | *                                       | 5        |
| Racey              | *   | NA  | *                                    | NA                                | U              | *                              | *                         | *                                       | 5        |
| Schwarte           | *   | NA  | *                                    | NA                                | *              | *                              | U                         | *                                       | 5        |
| Sengupta           | *   | U   | *                                    | NA                                | *              | *                              | *                         | U                                       | 5        |
| Settipani          | *   | NA  | *                                    | NA                                | U              | *                              | U                         | *                                       | 4        |
| Stewart            | *   | NA  | U                                    | NA                                | U              | *                              | *                         | *                                       | 4        |
| Sung               | *   | NA  | *                                    | NA                                | **             | *                              | U                         | NA                                      | 5        |
| Tan                | *   | *   | *                                    | U                                 | *              | *                              | *                         | NA                                      | 6        |

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|           |   |    |   |    |   |   |   |   |   |
|-----------|---|----|---|----|---|---|---|---|---|
| Timmer    | U | NA | * | NA | U | * | U | * | 3 |
| Truttmann | * | NA | * | NA | U | * | * | * | 5 |
| Wilksch   | * | NA | U | NA | U | * | * | U | 3 |
| Zeiler    | * | NA | * | NA | U | * | * | U | 4 |

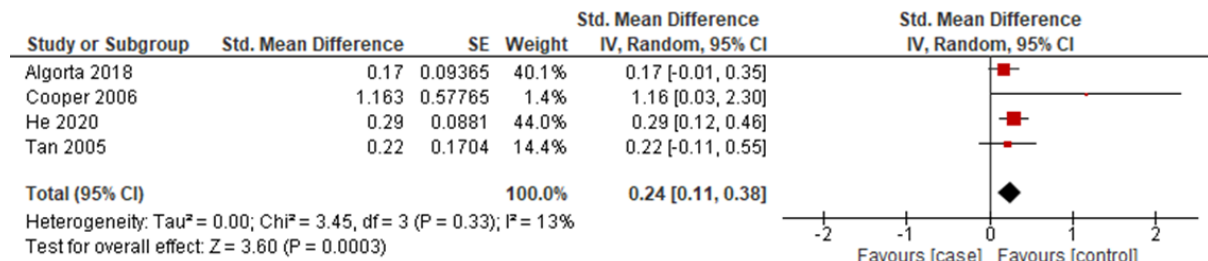
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## Supplementary Materials 4: Forest plots

Figure S4.1 Forest plots comparing case-control data for a) depression and b) parent stress

### A: Forest plot for case-control studies measuring depression



### B: Forest plot for case-control studies measuring parent stress

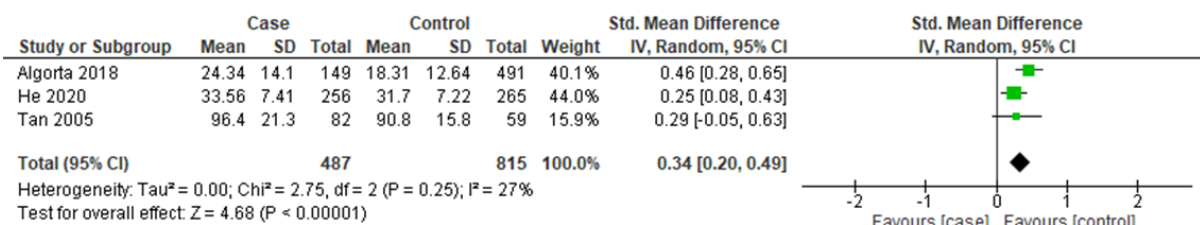
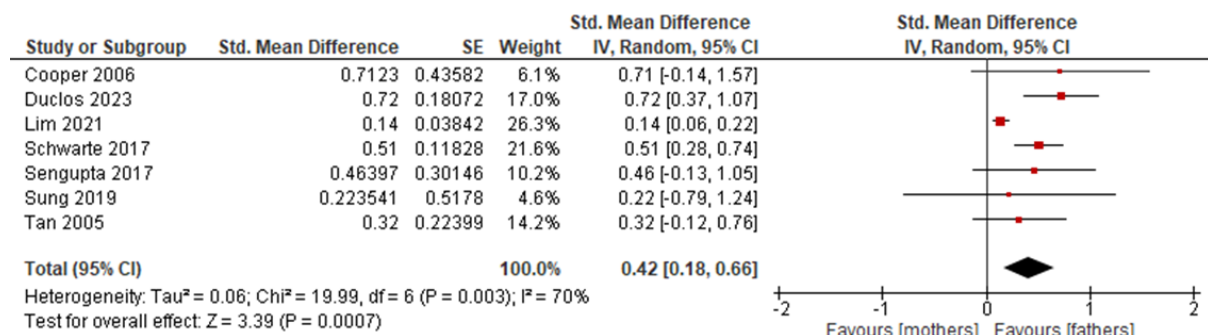
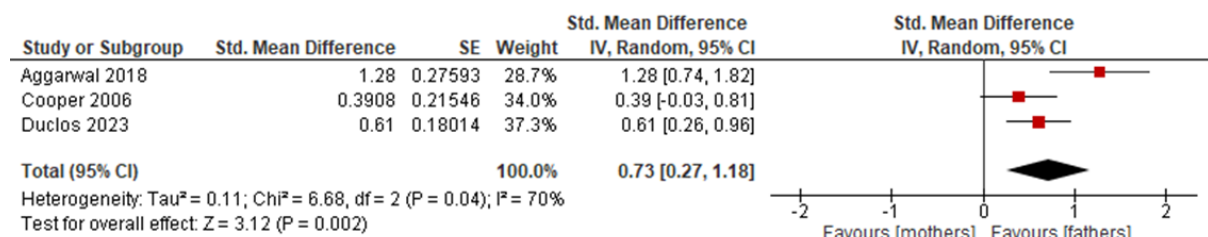


Figure S4.2 Forest plots comparing data from mothers and fathers for a) depression and b) anxiety

### A: Forest plot comparing depression scores between mothers and fathers



### B: Forest plot comparing anxiety scores between mothers and fathers



## Supplementary Materials 5: Sensitivity Analysis

Sensitivity analysis was performed by removing each study in turn from each meta-analysis comparison. Table S5.1 provides the details of the impact of this on the report mean differences and 95% confidence intervals.

| Comparison      | Outcome          | Study deleted      | Mean difference (95% CI)  |
|-----------------|------------------|--------------------|---------------------------|
| Case-control    | Depression       | All in             | 0.24 (0.11-0.38)          |
|                 |                  | Algorta 2018       | 0.30 (0.10-0.50)          |
|                 |                  | Cooper 2006        | 0.23 (0.11-0.35)          |
|                 |                  | <u>He 2020</u>     | <u>0.23 (-0.01-0.47)*</u> |
|                 |                  | Tan 2005           | 0.22 (0.07-0.4%)          |
| Case-control    | Parenting stress | All in             | 0.34 (0.20-0.49)          |
|                 |                  | Algorta 2018       | 0.26 (0.11-0.41)          |
|                 |                  | He 2020            | 0.42 (0.26-0.59)          |
|                 |                  | Tan 2005           | 0.36 (0.15-0.56)          |
| Mothers-fathers | Depression       | All in             | 0.42 (0.18-0.66)          |
|                 |                  | Cooper 2006        | 0.40 (0.15-0.65)          |
|                 |                  | Duclos 2003        | 0.34 (0.12-0.56)          |
|                 |                  | Lim 2021           | 0.53 (0.36-0.69)          |
|                 |                  | Schwarte 2017      | 0.39 (0.12-0.67)          |
|                 |                  | Sengupta 2017      | 0.41 (0.15-0.67)          |
|                 |                  | Sung 2019          | 0.43 (0.17-0.68)          |
|                 |                  | Tan 2005           | 0.44 (0.16-0.71)          |
| Mothers-fathers | Anxiety          | All in             | 0.73 (0.17-1.18)          |
|                 |                  | Aggarwal 2018      | 0.52 (0.25-0.79)          |
|                 |                  | Cooper 2006        | 0.91 (0.26-1.57)          |
|                 |                  | <u>Duclos 2023</u> | <u>0.82 (-0.05-1.69)*</u> |

\*95% CI crosses zero and no longer statistically significant at  $p < 0.05$

For case-control depression, study characteristics are:

| Study        | n   | CYP condition | Country  | Measure | Significant difference? |
|--------------|-----|---------------|----------|---------|-------------------------|
| Algorta 2018 | 612 | Bipolar       | UK       | GBI     | No                      |
| Cooper 2006  | 215 | Anxiety       | UK       | SCID    | Yes                     |
| He 2020      | 521 | ODD           | China    | CESD    | Yes                     |
| Tan 2005     | 141 | Depression    | Malaysia | BDI     | No                      |

For mother-father anxiety, study characteristics are:

| Study         | n   | CYP condition | Country | Measure | Significant difference? |
|---------------|-----|---------------|---------|---------|-------------------------|
| Aggarwal 2018 | 32  | ODD           | India   | HAMA    | Yes                     |
| Cooper 2006   | 215 | Anxiety       | UK      | SCID    | No                      |
| Duclos 2023   | 135 | Anorexia      | France  | HADS    | Yes                     |