## **Supplementary material**

## **Search strings per database**

1. **Medline**

(Psychosis or psychotic or schizophreni\* or hallucinat\* or delusion\* or paranoi\* or negative)

AND

PTCI OR (Posttraumatic cogniti)\* OR (Post-traumatic cogniti\*) OR (post traumatic cogniti\*) OR (Trauma adj2 cogniti\*) OR (Posttraumatic belief\*) OR (Post-traumatic belief\*) OR (post traumatic belief\*) OR (Trauma adj2 belief\*) OR (Posttraumatic schema\*) OR (Post-traumatic schema\*) OR (post traumatic schema\*) OR (Trauma adj2 schema\*) OR (PTSD adj6 cogniti\*) OR (PTSD adj6 belief\*) OR (PTSD adj6 schema\*) OR (Trauma adj2 therap\*) OR EMDR OR (Eye Movement Desensitization and Reprocessing) OR (Cognitive restructuring) OR (Prolonged exposure)

1. **PsychINFO**

(Psychosis or psychotic or schizophreni\* or hallucinat\* or delusion\* or paranoi\* or negative)

AND

(PTCI or Posttraumatic cogniti\* or Post-traumatic cogniti\* or post traumatic cogniti\* or (Trauma adj2 cogniti\*) or Posttraumatic belief\* or Post-traumatic belief\* or post traumatic belief\* or (Trauma adj2 belief\*) or Posttraumatic schema\* or Post-traumatic schema\* or post traumatic schema\* or (Trauma adj2 schema\*) or (PTSD adj6 cogniti\*) or (PTSD adj6 belief\*) or (PTSD adj6 schema\*) or (Trauma adj2 therap\*) or EMDR or (Eye Movement Desensitization and Reprocessing) or Cognitive restructuring or Prolonged exposure)

1. **Embase**

Psychosis or psychotic or schizophreni\* or hallucinat\* or delusion\* or paranoi\* or negative

AND

(PTCI or Posttraumatic cogniti\* or Post-traumatic cogniti\* or post traumatic cogniti\* or (Trauma adj2 cogniti\*) or Posttraumatic belief\* or Post-traumatic belief\* or post traumatic belief\* or (Trauma adj2 belief\*) or Posttraumatic schema\* or Post-traumatic schema\* or post traumatic schema\* or (Trauma adj2 schema\*) or (PTSD adj6 cogniti\*) or (PTSD adj6 belief\*) or (PTSD adj6 schema\*) or (Trauma adj2 therap\*) or EMDR or (Eye Movement Desensitization and Reprocessing) or Cognitive restructuring or Prolonged exposure)

1. **Web of science**

Psychosis or psychotic or schizophreni\* or hallucinat\* or delusion\* or paranoi\* or negative

AND

PTCI or "Posttraumatic cogniti\*" or "Post-traumatic cogniti\*" or "post traumatic cogniti\*" or (Trauma near/2 cogniti\*) or "Posttraumatic belief\*" or "Post-traumatic belief\*" or "post traumatic belief\*" or (Trauma near/2 belief\*) or "Posttraumatic schema\*" or "Post-traumatic schema\*" or "post traumatic schema\*" or (Trauma near/2 schema\*) or (PTSD near/6 cogniti\*) or (PTSD near/6 belief\*) or (PTSD near/6 schema\*) or (Trauma near/2 therap\*) or EMDR or "Eye Movement Desensitization and Reprocessing" or "Cognitive restructuring" or "Prolonged exposure"

*Note.* Selected “Topic” search

1. **CINHAL**

Psychosis or psychotic or schizophreni\* or hallucinat\* or delusion\* or paranoi\* or negative

AND

PTCI or "Posttraumatic cogniti\*" or "Post-traumatic cogniti\*" or "post traumatic cogniti\*" or (Trauma n2 cogniti\*) or "Posttraumatic belief\*" or "Post-traumatic belief\*" or "post traumatic belief\*" or (Trauma n2 belief\*) or "Posttraumatic schema\*" or "Post-traumatic schema\*" or "post traumatic schema\*" or (Trauma n2 schema\*) or (PTSD n6 cogniti\*) or (PTSD n6 belief\*) or (PTSD n6 schema\*) or (Trauma n2 therap\*) or EMDR or "Eye Movement Desensitization and Reprocessing" or "Cognitive restructuring" or "Prolonged exposure"

1. **Cochrane**

Psychosis or psychotic or schizophreni\* or hallucinat\* or delusion\* or paranoi\* or negative

AND

PTCI or (Posttraumatic cogniti\*) or (Post-traumatic cogniti\*) or (post traumatic cogniti\*) or (Trauma near/2 cogniti\*) or (Posttraumatic belief\*) or (Post-traumatic belief\*) or (post traumatic belief\*) or (Trauma near/2 belief\*) or (Posttraumatic schema\*) or (Post-traumatic schema\*) or (post traumatic schema\*) or (Trauma near/2 schema\*) or (PTSD near/6 cogniti\*) or (PTSD near/6 belief\*) or (PTSD near/6 schema\*) or (Trauma near/2 therap\*) or EMDR or (Eye Movement Desensitization and Reprocessing) or (Cognitive restructuring) or (Prolonged exposure)

*Note.* Selected “trials” on

## **Supplementary material**

## **Information regarding requests for study data**

*Requests for further data per study and the data provided*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Hallucinations and PTCI** | **Delusions and PTCI** | **Paranoia and PTCI** | **Negative and PTCI** |
| Brand et al., (2022) | *r* = .15(Correlation between PSYRATS hallucination scale and PTCI total score) | *r* = -.13(Correlation between PSYRATS delusion scale and PTCI total score) |  |  |
| Calvert et al., (2008) |  | *r* = .49(Correlation between PDI and PTCI total score) | *r* = .54(Correlation between PS and PTCI total score) |  |
| Campbell & Morrison (2007a) | Correlation between rLHS and PTCI total score was requested. PTCI subscale scores averaged for meta-analysis.  |  | Correlation with PTCI total score requested. PTCI subscale scores averaged for meta-analysis. |  |
| Campbell & Morrison (2007b) |  | Correlation with PTCI total score requested. PTCI subscale scores averaged for meta-analysis. |  |  |
| Carr et al., (2018) |  |  |  | Could not be contacted – study **removed** from systematic review and meta-analysis. |
| Freeman et al., (2013) |  | *r* = .43(Correlation between PSYRATS delusion scale and PTCI total score) | *r* =.69(Correlation between GPTS and PTCI total score) | Correlation with PTCI total score requested. Did not this information to include in meta-analysis. |
| Geddes et al., (2016) | Correlation between CAPS and PTCI total score at baseline was requested. Included in systematic review but did not have data to include in the meta-analysis. |  |  |  |
| Kilcommons & Morrison (2005) |  |  |  | Correlation with PTCI total score requested. Did not have data to include in meta-analysis. |
| Kilcommons et al., (2008) | Correlation with PSYRATS auditory hallucination scale requested PTCI total score was requested. PTCI subscale scores were averaged for meta-analysis. Only data regarding sexual trauma sample available for review and meta-analysis. | Correlation between PDI total score and PTCI total score requested. PTCI subscale scores were averaged for meta-analysis. |  |  |
| Mueser et al., (2015 |  |  |  | *r* = .247(Correlation between PANNS negative symptom subscales and PTCI total score) |
| Peach et al., (2019) |  |  |  | Spearman’s rho = .184, *p*= .138.(Correlation between PANSS negative symptom scale and PTCI total score) |
| Steel et al., (2017) | *r* = .53(Correlation between PSYRATS auditor hallucination subscale and PTCI total score) | *r* = .58(Correlation between PSYRATS delusion subscale and PTCI total score) |  | Correlation between PANSS negative symptoms scale and PTCI score requested. Did not have data to include in meta-analysis. |
| Van den Berg et al., (2013) | *r* = 0.21(Correlation between PSYRATS auditory hallucination scale and PTCI total score) | *r* = .29(Correlation between PSYRATS delusion scale and PTCI total score) |  |  |
| Van der Veugel et al., (2020) |  |  | *r* = .50(Correlation between GPTS and PTCI total score) |  |

***Note.*** ‘*’Correlation with PTCI total score was* *requested’’* indicates that authors were contacted for additional information, but data could not be provided due to authors no longer having access to raw dataset or because the author did not respond to the request. PSYRATS (Psychotic Symptoms Rating Scale); PANSS (Positive and Negative Syndrome Scale); CAPS (Cardiff Anomalous Perceptions Scale); rLHS (revised Launay-Slade Hallucination); PDI (Peters Delusions Inventory); GPTS (Green Paranoia Thought Scale); PS (Paranoia Scale). PTCI (Posttraumatic cognitions inventory).

**Supplementary Material**

**Information about measures utilized in included studies.**

***Psychosis symptom measures***

Seven different measures were used across the studies included in the review (see Table 1). The most commonly used measures were the Psychotic Symptoms Rating Scale (PSYRATS; Haddock, McCarron, Tarrier, & Faragher, 1999) and the negative subscale of the Positive and Negative Syndrome Scale (PANNS; Kay, Fizbein, & Opler, 1987). The PSYRATS comprises a semi-structured interview designed to measure different dimensions of delusions and auditory hallucinations. One study adapted items from the PSYRATS auditory hallucination scale to assess for visual hallucinations (Kilcommons et al., 2008). The PANSS comprises an observer rated assessment of positive and negative psychosis symptoms as well as general psychopathology. Self-report measures included the Launay-Slade Hallucination Scale-revised (rLHS; Morrison, Wells, & Nothard, 2000) and the Cardiff Anomalous Perceptions Scale (CAPS; Bell, Halligan & Ellis, 2006), both measures of hallucinatory experiences in non-clinical samples. The Peters Delusions Inventory (PDI; Peters, Joseph, Day, & Garety; 2004), which measures delusional ideation in the general population. In addition, the Green Paranoia Thought Scale (GPTS; Green et al., 2008) and the Paranoia Scale (PS; Fenigstein & Vanable, 1992) both assess the severity of paranoid thoughts.

***Measures of trauma-related beliefs***

Two measures of trauma-related beliefs were used across the included studies (see Table 1). The posttraumatic cognitions inventory (PTCI; Ehlers, Clark, Tolin and Orsillo, 1999) was the most used measure (k = 14). The PTCI is a self-report measure designed to assess thoughts and beliefs related to traumatic experiences. The questionnaire comprises three subscales: negative cognitions about the self, negative cognitions about others, and self-blame. One study used the Core Beliefs Inventory (CBI; Cann et al., 2010). The CBI is a self-report measure that assesses the level of disruption of the assumptive world following a stressful or traumatic event. The CBI assesses religious and spiritual beliefs, human nature, relationships with others, meaning in life, and personal strength and weakness.”

## **Supplementary material**

##  **Global and domain specific quality appraisal ratings**

*Global and domain specific quality appraisal ratings*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study | Selection bias | Study design | Data collection - hallucinations | Data collection - delusions | Data collection - paranoia | Data collection - negative symptoms | Data collection - trauma related beliefs | Withdrawals and drop-outs | Analysis | Overall quality rating |
| Brand et al., (2022) | Weak | Weak | Strong | Strong | n/a | n/a | Strong | n/a | Weak | Weak |
| Calvert et al., (2008) | Weak | Weak | n/a | Strong | Strong | n/a | Strong | n/a | Strong | Weak |
| Campbell & Morrison (2007a) | Weak | Weak | Strong | n/a | Strong | n/a | Strong | n/a | Moderate | Weak |
| Campbell & Morrison (2007b) | Moderate | Weak | n/a | Strong | n/a | n/a | Strong | n/a | Moderate | Moderate |
| Freeman et al., (2013) | Weak | Moderate | n/a | Strong | Strong | n/a | Strong | Strong | Moderate | Moderate |
| Geddes et al., (2016) | Weak | Moderate | Moderate | n/a | n/a | n/a | Strong | Strong | Moderate | Moderate |
| Kilcommons & Morrison (2005) | Moderate | Weak | Moderate | Moderate | n/a | n/a | Strong | n/a | Moderate | Moderate |
| Kilcommons et al., (2008) | Moderate | Weak | Moderate | Strong | n/a | n/a | Strong | n/a | Moderate | Moderate |
| Mazor et al., (2020) | Moderate | Weak | n/a | n/a | n/a | Strong | Strong | n/a | Moderate | Moderate |
| Morrison & Petersen (2003) | Weak | Weak | Strong | n/a | n/a | n/a | Strong | n/a | Moderate | Weak |
| Mueser et al., (2015) | Moderate | Weak | n/a | n/a | n/a | Strong | Strong | n/a | Moderate | Moderate |
| Peach et al., (2018) | Moderate | Weak | Moderate | Moderate | n/a | Strong | Strong | n/a | Strong | Moderate |
| Steel et al., (2017) | Moderate | Weak | Strong | Strong | n/a | Strong | Strong | n/a | Moderate | Moderate |
| van den Berg et al., (2015) | Strong | Weak | Strong | Strong | n/a | n/a | Strong | n/a | Moderate | Moderate |
| van der Vleugel et al., (2020) | Strong | Strong | n/a | n/a | Strong | n/a | Strong | Strong | Strong | Strong |

Note. Quality ratings are scored in relation to the association between trauma-related beliefs and psychosis symptoms please see adapted quality assessment tool for quantitative studies adapted version.

## **Supplementary material**

##  **Quality Assessment Tool for Quantitative Studies – Adapted Version**

**A SELECTION BIAS**

(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?

1          Very likely

2          Somewhat likely

3          Not likely

4          Can’t tell

(Q2) What percentage of selected individuals agreed to participate?

1          80 - 100% agreement

2          60 – 79% agreement

3          less than 60% agreement

4          Not applicable

5          Can’t tell

Rate this section – see dictionary

|  |  |  |  |
| --- | --- | --- | --- |
| Score  | Strong  | Moderate  | Weak  |
|    | 1  | 2  | 3  |

**B) STUDY DESIGN**

1     Randomized controlled trial or controlled clinical trial

2     Longitudinal study

3     Any other method or did not state method used

Rate this section – see dictionary

|  |  |  |  |
| --- | --- | --- | --- |
| Score  | Strong  | Moderate  | Weak  |
|    | 1  | 2  | 3  |

**C) DATA COLLECTION METHODS – psychosis**

(Q1) Were data collection tools shown to be valid?

1 Yes

2 No

3 Can’t tell

(Q2) Were data collection tools shown to be reliable?

1 Yes

2 No

3 Can’t tell

(Q3) Were single items selected from valid and reliable scales as a proxy for symptoms?

1 Yes

2 No

3.           n/a

Rate this section – see dictionary

|  |  |  |  |
| --- | --- | --- | --- |
| Score  | Strong  | Moderate  | Weak  |
|    | 1  | 2  | 3  |

**D) DATA COLLECTION METHODS – trauma-related beliefs**

(Q1) Were data collection tools shown to be valid?

1 Yes

2 No

3 Can’t tell

(Q2) Were data collection tools shown to be reliable?

1 Yes

2 No

3 Can’t tell

(Q3) Were single items selected from valid and reliable scales as a proxy for symptoms?

1 Yes

2            No

Rate this section – see dictionary

|  |  |  |  |
| --- | --- | --- | --- |
| Score  | Strong  | Moderate  | Weak  |
|    | 1  | 2  | 3  |

**E) WITHDRAWALS AND DROP-OUTS**

(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?

1 Yes

2 No

3 Can’t tell

4 Not Applicable (i.e. one time surveys or interviews)

(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).

1 80 -100%

2 60 - 79%

3 less than 60%

4 Can’t tell

5 Not Applicable

Rate this section see dictionary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Score  | Strong  | Moderate  | Weak  |    |
|    | 1  | 2  | 3  | Not applicable   |

F) ANALYSIS

(Q1) Are the statistical methods appropriate for the study design?

1 Yes

2 No

3 Can’t tell

(Q2) Was the significance level adjusted appropriately for the number of comparisons being conducted?

1 Yes

2 No

3 Can’t Tell

Rate this section – see dictionary

|  |  |  |  |
| --- | --- | --- | --- |
| Score  | Strong  | Moderate  | Weak  |
|    | 1  | 2  | 3  |

Dictionary

**A) SELECTION BIAS**

Q1) Participants are more likely to be representative of the target population if they are randomly selected from a comprehensive list of individuals in the target population (score very likely). They may not be representative if they are referred from a source (e.g. clinic) in a systematic manner (score somewhat likely) or self-referred (score not likely).

Overall scoring

Strong: The selected individuals are very likely to be representative of the target population (Q1 is 1) and there is greater than 80% participation (Q2 is 1).

Moderate: The selected individuals are at least somewhat likely to be representative of the target population (Q1 is 1 or 2); and there is 60 - 79% participation (Q2 is 2). ‘Moderate’ may also be assigned if Q1 is 1 or 2 and Q2 is 5 (can’t tell).

Weak: The selected individuals are not likely to be representative of the target population (Q1 is 3); or there is less than 60% participation (Q2 is 3) or selection is not described (Q1 is 4); and the level of participation is not described (Q2 is 5)

**B) STUDY DESIGN**

Study design is considered in relation to the results regarding the association between trauma-related beliefs and psychosis symptoms rather than over all study design. For example, an RCT that only provides information on the association from the baseline data would be rated as weak. In contrast, an RCT that provides longitudinal information about the association between trauma-related beliefs and psychosis symptoms would be rated as strong.

Overall scoring

Strong: will be assigned to those articles that describe RCTs and CCTs.

Moderate: will be assigned to those that described a longitudinal study

Weak: will be assigned to those that used any other method or did not state the method used.

**C) DATA COLLECTION TOOL – PSYCHOSIS SYMPTOMS**

Reliability and validity can be reported in the study or in a separate study. For example, some standard assessment tools have known reliability and validity. If more than one psychosis measure was used in the study, the lowest rated measure will be selected to appraise quality of the data collection of psychosis symptoms.

Overall scoring

Strong: The data collection tools have been shown to be valid (Q1 is 1) and reliable (Q2 is 1). Standardized scale or subscales have been used to measure symptoms (Q3 is 2).

Moderate: The data collection tools have been shown to be valid (Q1 is 1) but have not been shown to be reliable (Q2 is 2) OR data collection tool has been shown to be valid (Q1 is 1) and reliable (Q2 is 1) but single items from a validated and reliable measure have been used as a proxy for symptoms (Q3 is 1).

Weak: The data collection tools have not been shown to be valid (Q1 is 2) or reliable (Q2 is 2).

**E) DATA COLLECTION METHODS – TRAUMA-RELATED BELIEFS**

Reliability and validity can be reported in the study or in a separate study. For example, some standard assessment tools have known reliability and validity.

Overall scoring

Strong: The data collection tools have been shown to be valid (Q1 is 1) and reliable (Q2 is 1). Standardized scale or subscales have been used to measure symptoms (Q3 is 2).

Moderate: The data collection tools have been shown to be valid (Q1 is 1) but have not been shown to be reliable (Q2 is 2) OR data collection tool has been shown to be valid (Q1 is 1) and reliable (Q2 is 1) but single items from a validated and reliable measure have been used as a proxy for symptoms (Q3 is 1).

Weak: The data collection tools have not been shown to be valid (Q1 is 2) or reliable (Q2 is 2).

**E) WITHDRAWALS AND DROP-OUTS**

Only applicable to RCT, CCT, and longitudinal studies.

Score: YES if the authors describe BOTH the numbers and reasons for withdrawals and drop-outs. Score NO if either the numbers or reasons for withdrawals and drop-outs are not reported. The percentage of participants completing the study refers to the % of subjects remaining in the study at the final data collection period in all groups (i.e. control and intervention groups).

Overall scoring

Strong: will be assigned when the follow-up rate is 80% or greater (Q2 is 1).

Moderate: will be assigned when the follow-up rate is 60 – 79% (Q2 is 2) OR Q2 is 5 (N/A).

Weak: will be assigned when a follow-up rate is less than 60% (Q2 is 3) or if the withdrawals and drop-outs were not described (Q2 is 4).

**F) ANALYSIS**

Example of analysis not being appropriate; If sample size is <30 score ‘no’ as likely if insufficient power and distribution for a parametric analysis to assess a correlation.

Strong: will be assigned when the analysis is appropriate and the significance level accounts for the number of comparisons conducted (Q1 and Q2 are both 1)

Moderate: will be assigned when the analysis is appropriate, but the significance level has not been adapted. (Q1 is 1 and Q2 is 2)

Weak: will be assigned the suitability of the analyses and the adjustment of the significance level is not clear (Q1 and Q2 are 3).

**GLOBAL QUALITY RATING**

**STRONG:** no weak rating

**MODERATE:** one weak rating

**WEAK:** two or more weak ratings

Note.

* Information relevant for quality appraisal of Geddes et al., (2016) presented in Freeman et al., 2013.
* Information relevant for quality appraisal for van der Vleugel et al., (2020) van den Bont et al., (2015)
* Only sexual assault sample in Kilcommons et al., (2008) relevant for this review. Quality appraisal criteria should only be applied to this sample.