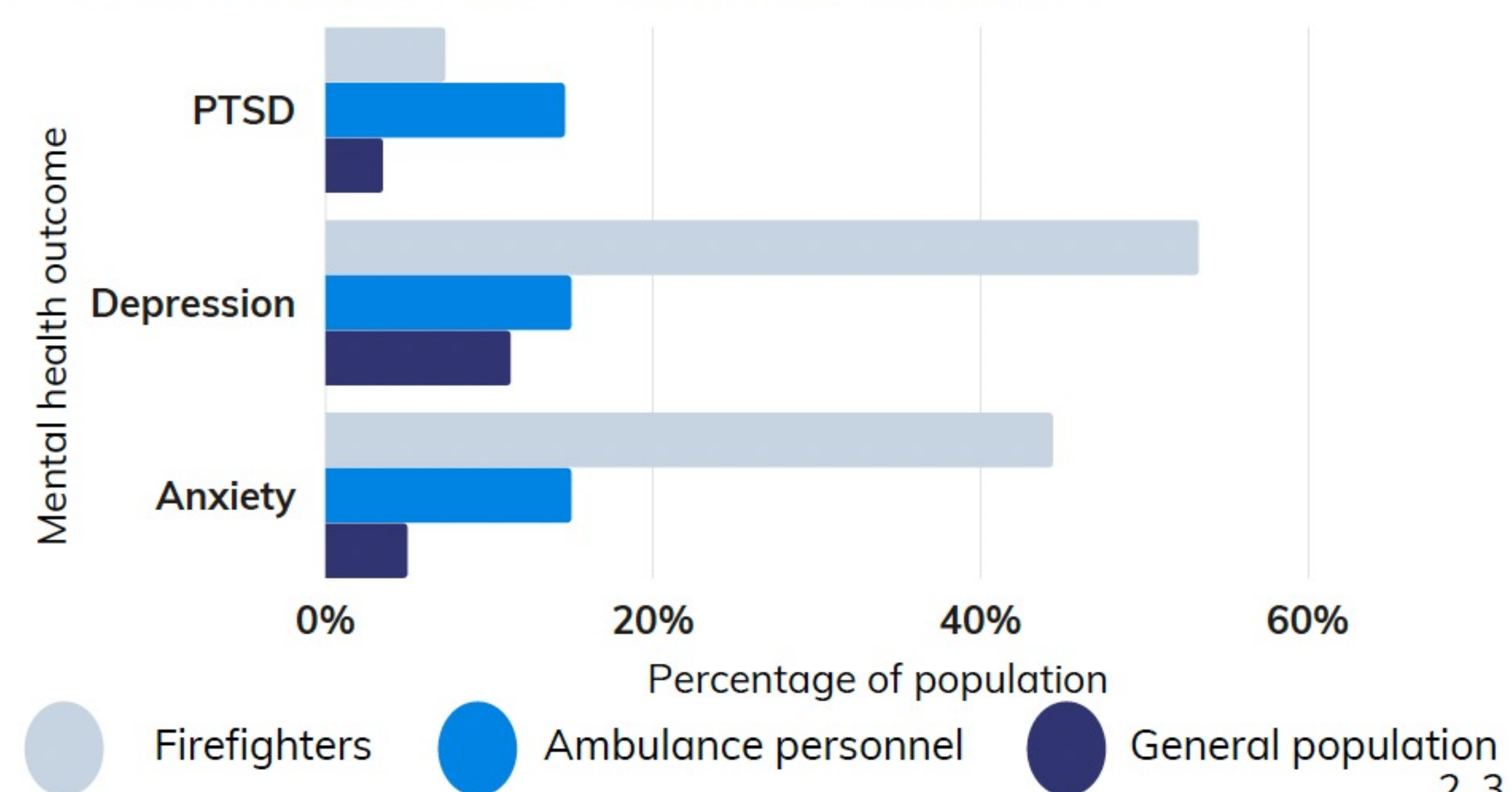


## KEY FINDINGS

Most studies (73%) used a cross-sectional design to assess the relationship between SOC and PTSS. All studies reported that lower PTSS were low to moderately associated with higher SOC scores ( $r = -0.17$  to  $-0.47$  and  $\beta = -0.31$ ,  $p = 0.009$ ). The casual analysis identified that there is insufficient research to support the causal relationship between the SOC and PTSS, as the literature does not support several criteria (i.e., strength, consistency, temporality, and experimental evidence). While the SOC evidence is preliminary, associations are sufficient to warrant future longitudinal and interventional studies.

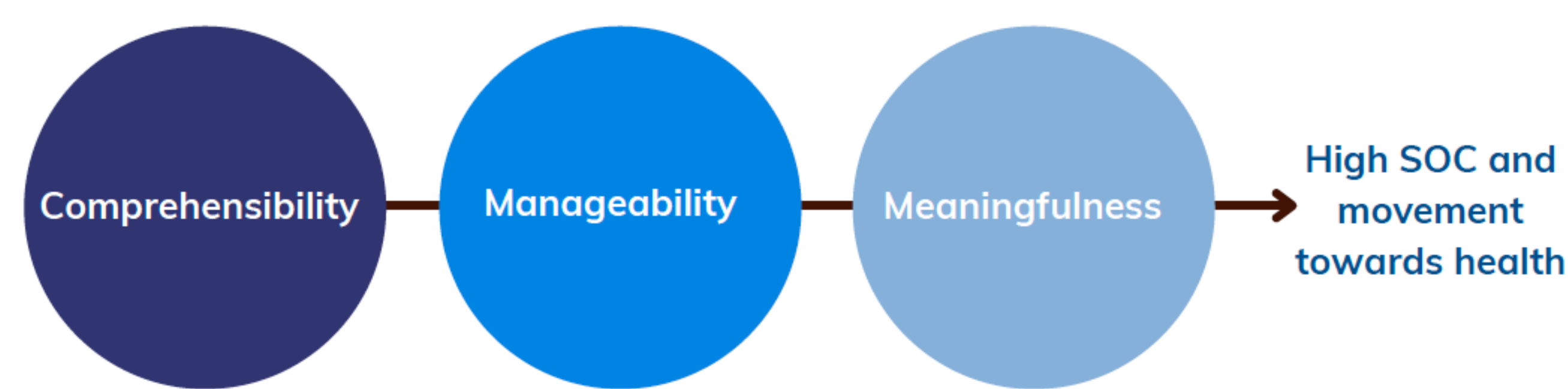
## Background

### Adverse Mental Health Outcomes among PSP



- The high mental demands of public safety personnel's (PSP) occupation may put them at greater risk for occupational stress injuries.
- PSP have 3 to 5 times higher rates of adverse mental health outcomes<sup>1</sup>.

### The SOC and its three elements



- The SOC has been hypothesized to mediate the effect of stress and foster resiliency in stressful situations. Although, current literature is unclear and limited.

## Objective

This scoping review answers two questions:

- What is the extent, nature, and quality of research that has investigated the SOC and PSP mental health
- Do findings from these studies support a causal relationship using the Bradford Hill criteria for causation

## Methods

- A systematic approach was used to identify relevant articles among seven databases, "grey" literature, and thorough hand-searching.
- The following information was extracted and summarized: author(s), year/country of publication, objective(s), type of study, participant details and demographics, definition of SOC, measurement of SOC, outcomes of interest and measurement, and results.
- After extraction and synthesis, a critical analysis of quality and causation were performed using QUIPS and Bradford Hill's rules for causation.

### Inclusion criteria:

- Evaluating firefighters, paramedics, or police officers and the SOC as it relates to mental health/illness



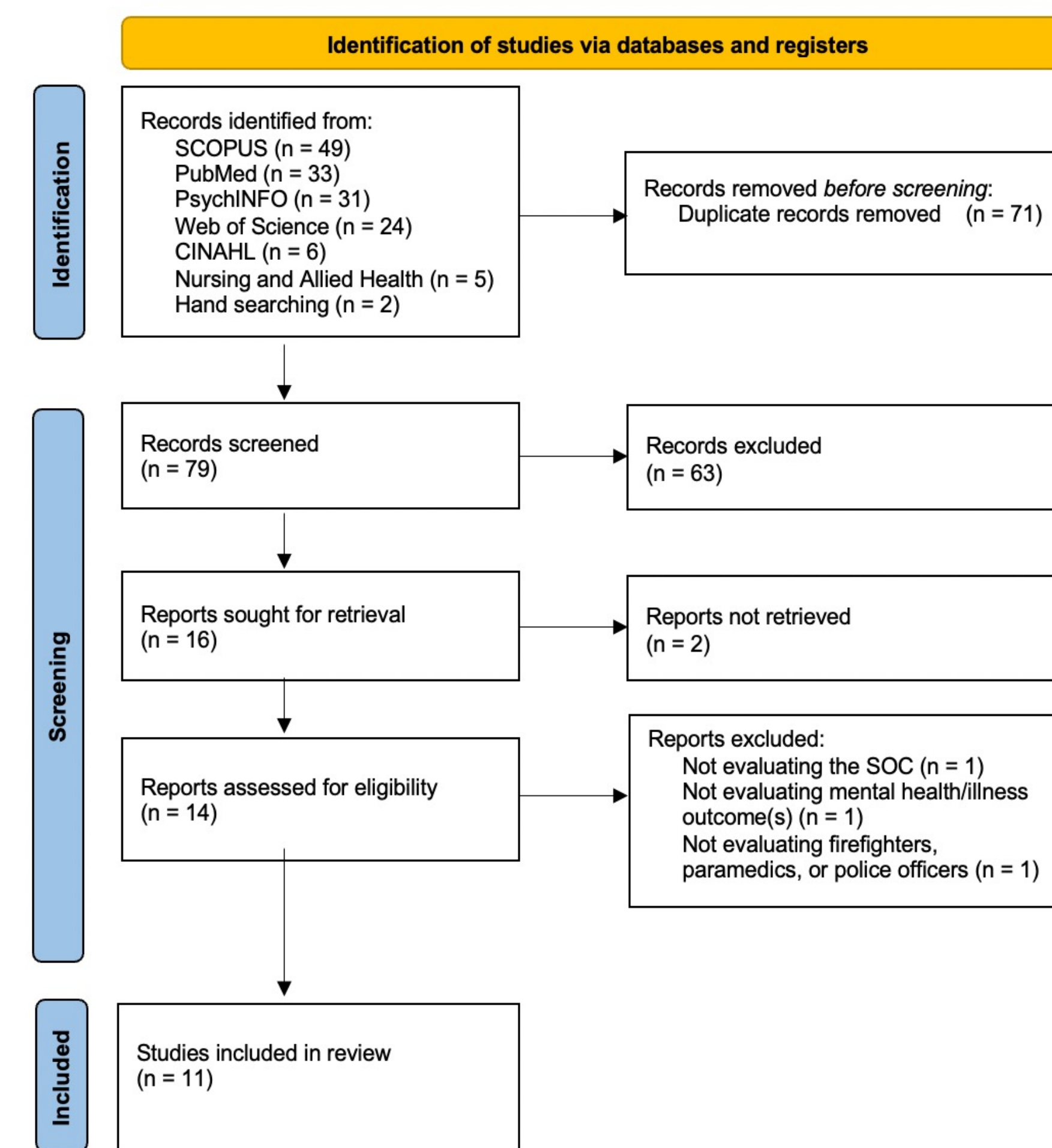
### Exclusion criteria:

- Did not directly assess the SOC
- Did not assess all three elements of the SOC



## Results

### PRISMA Flow Chart



### Study Design

Cross-sectional 91%

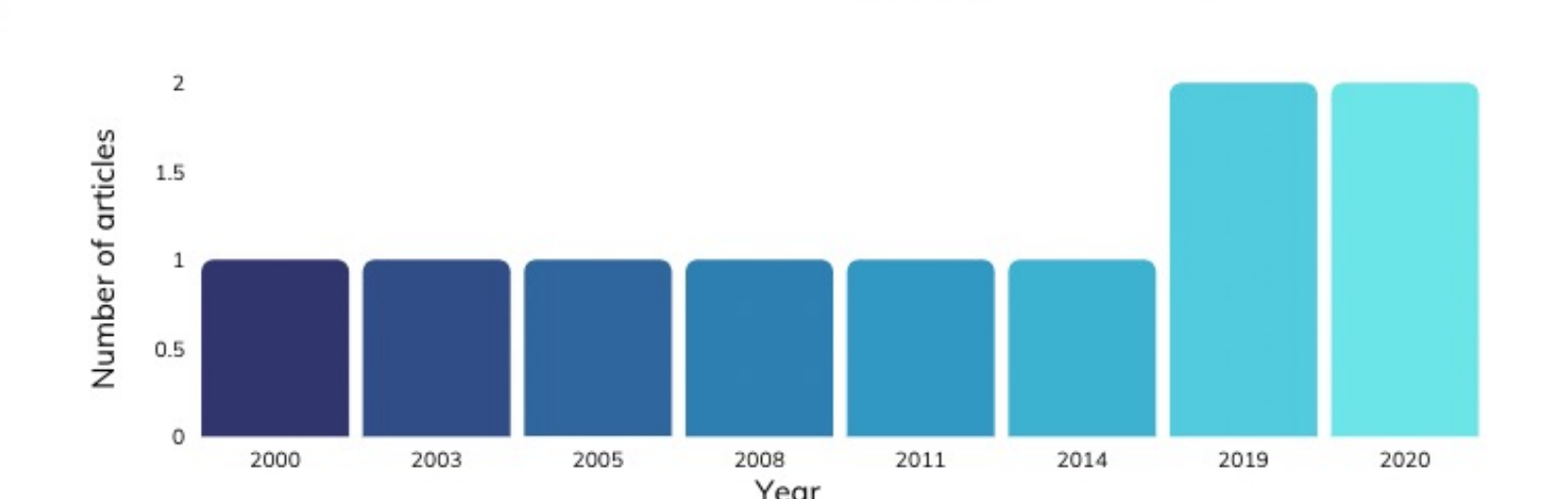
### SOC and PTSS Results

- The most common relationship assessed was between the SOC and PTSS (n=8, 73%).
- Six of these studies found that higher SOC scores had lower PTSS.
- One study found only higher manageability scores on the SOC scale had lower PTSS.
- The remaining study found that higher SOC scores had lower PTSS only in the sub-scale avoidance.

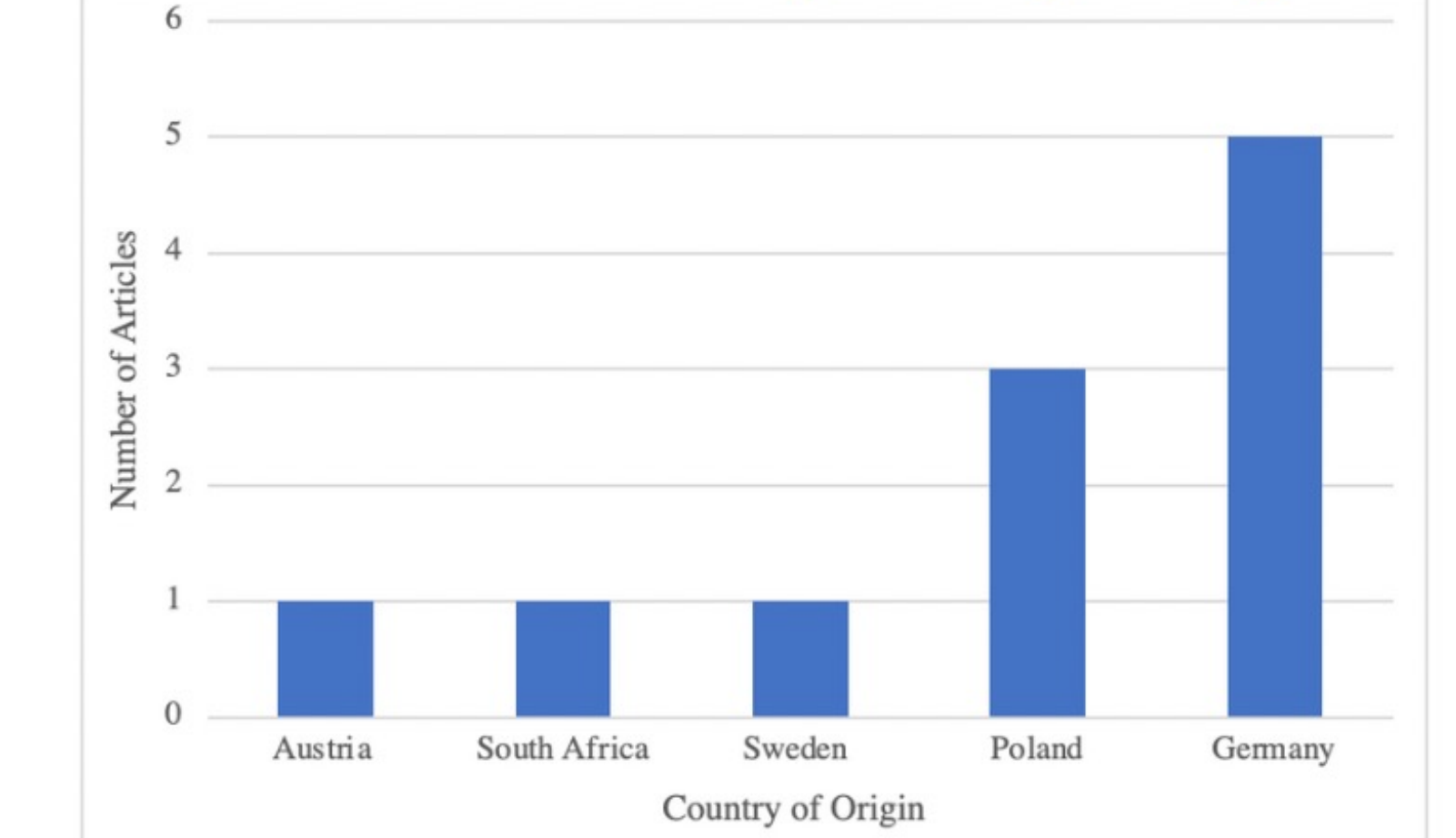
### QUIPS Summary

- The quality of the included studies was assessed using the QUIPS tool<sup>5</sup>.
- The majority (64%) of studies had medium to high risk-of-bias.
- The highest concerns were regarding selection and attrition bias.
- The most common concern was statistical analysis and reporting bias.

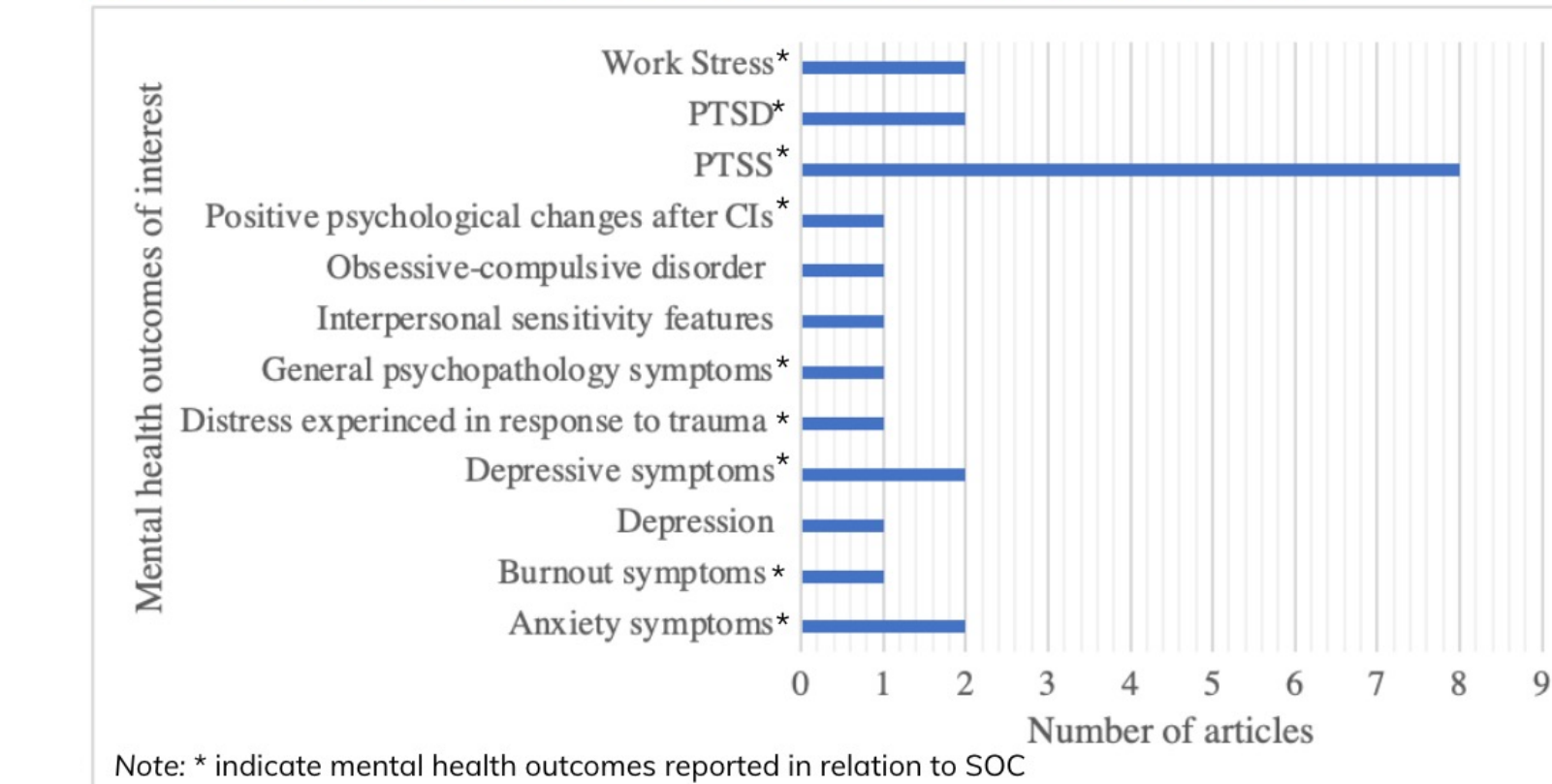
### Distribution of articles by year of publication



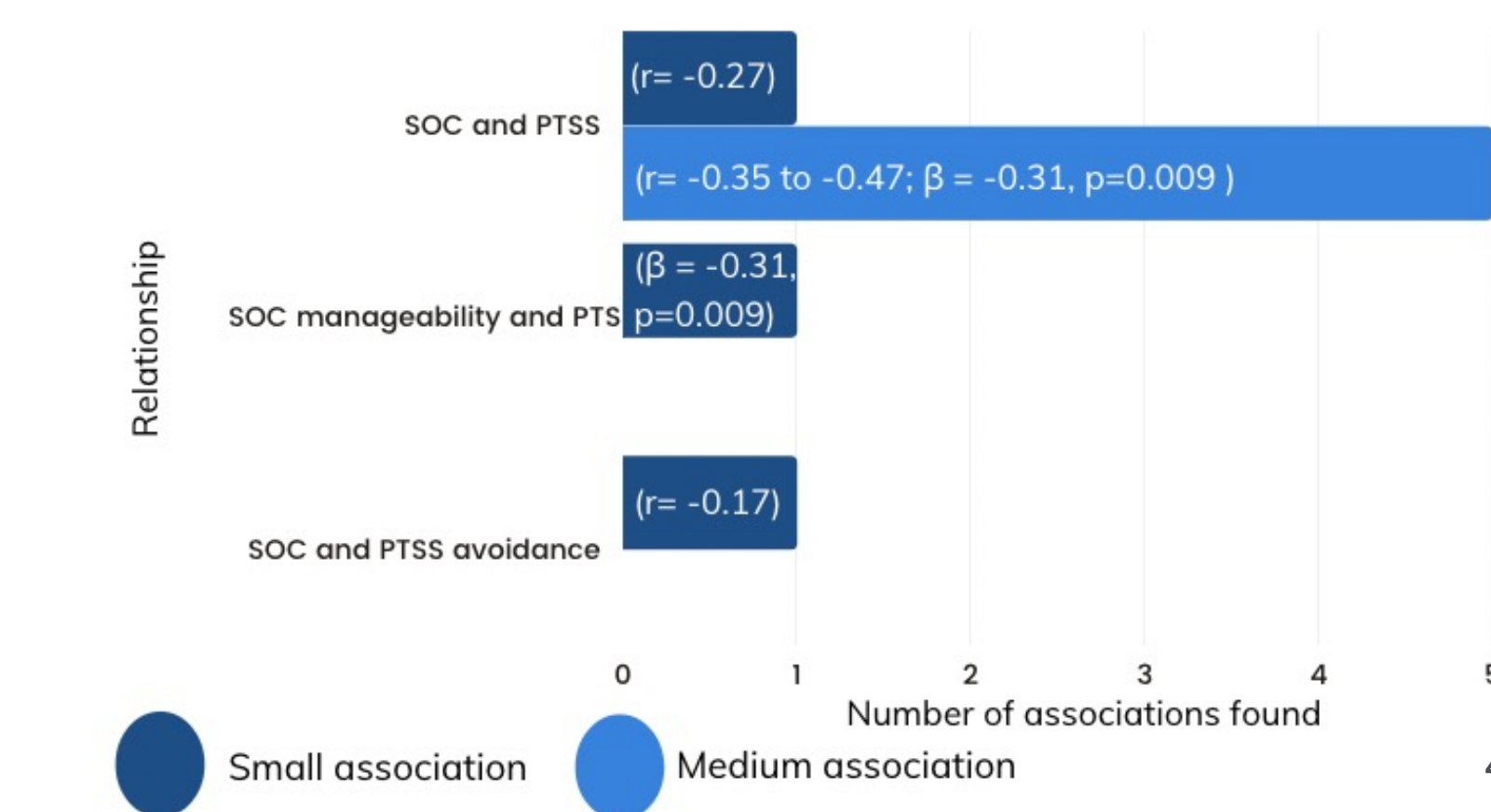
### Distribution of articles by country of origin



### Mental health outcomes of interest



### SOC and PTSS



Study	Risk of bias domains						Overall
	D1	D2	D3	D4	D5	D6	
Schäfer et al., 2020	Low	High	Low	Low	Low	Low	Low
Schnell et al., 2020	Low	Low	Low	Low	Low	Low	Low
Behrke et al., 2019	Low	Low	Low	Low	Low	Low	Low
Ragger et al., 2019	Low	High	Low	Low	Low	Low	Low
Sireb et al., 2014	Low	High	Low	Low	Low	Low	Low
Schütte et al., 2012	Low	Low	Low	Low	Low	Low	Low
Dudek & Szymczak, 2011	High	Low	Low	Low	Low	Low	High
Kassen & DiLalla, 2008	Low	Low	Low	Low	Low	Low	Low
Ogihara-Bulk, 2005	High	Low	Low	Low	Low	Low	High
Jonsson et al., 2003	Low	Low	Low	Low	Low	Low	Low
Dudek & Koniarok, 2000	Low	Low	Low	Low	Low	Low	High

Domains:  
 D1: Bias due to participation.  
 D2: Bias due to attrition.  
 D3: Bias due to prognostic factor measurement.  
 D4: Bias due to outcome measurement.  
 D5: Bias due to confounding.  
 D6: Bias in statistical analysis and reporting.

Judgement:  
 High (Red)  
 Moderate (Yellow)  
 Low (Green)  
 No information (Blue)

## Results (continued)

### Critical appraisal of the causal relationship

- Currently there is not enough literature or evidence to support a causal relationship between the SOC and PTSS among PSP.
- The current literature has failed to meet several causal criteria.
- Several criteria were unable to be assessed due to lack of data or analysis of existing data.
- We suggest that specificity is irrelevant in the SOC-mental health relationship.
- The only criteria that can be met at this time is plausibility.

Hill's causal criteria	Judgement
Strength of the relationship	Failure to meet criteria (X)
Consistency of the evidence	Failure to meet criteria (X)
Specificity	Not applicable
Temporality of exposure	Failure to meet criteria (X)
Biological gradient	Unable to be assessed (?)
Plausibility of the relationship	Criteria met (+)
Coherence	Unable to be assessed (?)
Experimental evidence	Failure to meet criteria (X)
Analogy of similar relationships	Unable to be assessed (?)

## Conclusion

- The literature surrounding the SOC as it relates to PSP mental health is limited with little variation in study design and location and there are concerns about the quality of this evidence.
- The results of the included studies showed that a higher SOC had significantly lower adverse mental health outcomes in ten articles and higher positive mental health outcomes in one article.
- There are several limitations to this study including, small number of included articles, quality of included articles, reporting inconsistencies, missing data, and inclusion of pooled results among these articles.
- The SOC as it relates to mental health is consistent with existing biological and social models, there is some evidence that it may act as a protective factor in other populations, and there were low to moderate associations in this scoping review. These findings are sufficient to warrant future research.
- Due to the small number of articles, lack of large associations and medium to high concern for bias (i.e., strength), variation in results (i.e., consistency), temporality, and experimental evidence, the literature was unable to support a causal relationship.

## Discussion

- The current evidence for causality among SOC and PTSS is preliminary with limited support for causality.
- Included studies have failed to integrate quality assessment and Hill's aspects of association to determine a causal relationship.
- We suggest that future research should focus on longitudinal and interventional study designs among a variety of populations, locations, and methods; and should integrate causation-based hypothesis testing in study protocols, analyses, and interpretation.
- These studies should analyse several mental health outcomes and routinely include dose response curves.