

Diagnostic test accuracy of screening tools for post-traumatic stress disorder among refugees and asylum seekers: A protocol for a systematic review of diagnostic test accuracy studies

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Funding: None

Registration: This protocol has been registered on the Open Science Framework: doi.org/10.17605/OSF.IO/PHNJV

Suggested citation: Magwood, O., Bellai Dussault, K., Fox, G., McCutcheon, C., Adams, O., Saad, A., Kassam, A., (2021). Diagnostic test accuracy of screening tools for post-traumatic stress disorder among refugees and asylum seekers: A protocol for a systematic review of diagnostic test accuracy studies. *Cochrane Equity Methods*: Ottawa, Canada. Available from: <https://methods.cochrane.org/equity/projects/global-mental-health>

Introduction

Globally, there are over 26 million refugees and over 4 million asylum seekers, (UNHCR, 2020). Many refugees experience high exposure of trauma related to war, persecution, loss of family members, and poor access to resources (Kalt et al., 2013; Javanbakht, 2019), leading to rates of post-traumatic stress disorder (PTSD) among refugees ten times higher than the general population (Fazel et al., 2005; Kirmayer et al., 2011). Among adult refugees, the prevalence of PTSD is approximately 30% (Blackmore et al., 2020) and between 19-53% among children and adolescents (Kien et al., 2020). Despite this, PTSD is not routinely screened for among refugee and asylum seeker populations prior to resettlement.

Post-traumatic stress disorder is a psychological condition triggered by the direct or indirect experience of a traumatic event, defined by the DSM-5 as “actual or threatened death, serious injury, or sexual violence” (American Psychological Association, 2013, p. 271). The condition is characterized by recurring memories, dreams, or “flashbacks” (p. 271) of the event; avoidance of reminders of the event, such as people, places, or topics of conversation; persistent negative thoughts or moods; and “marked alterations in arousal and reactivity” (p. 271), such as irritability or sudden anger, hypervigilance and difficulty sleeping. The two main standards for defining and diagnosing PTSD are the DSM-5 and the ICD-11 (World Health Organization,

2011). The core criteria for these standards are similar, but they are not identical. PTSD is diagnosed through a semi-structured interview where a trained clinician applies the standardized criteria of the DSM-5 or the ICD-11.

Early identification of mental health conditions can facilitate refugee resettlement through development of positive relationships, reduced intergenerational trauma, and increased access to employment (Blackmore et al., 2020). If conditions like PTSD go undetected, individuals are left to cope with severe psychological and physical stress with no clinical support. Early identification, if accompanied by timely, effective intervention, improves functioning and resiliency such that refugees can be more engaged in successful resettlement. Pre-settlement health assessments, occurring pre-departure or post-arrival, represent an important component of the migration process and offer an opportunity to identify mental health conditions and ensure timely specialist referrals (Ali et al., 2016).

Immigration officials are responsible for the admission and social integration of refugees. These departments process refugee applicants and facilitate immigration medical examinations (IMEs) prior to departure or upon arrival. IMEs are typically conducted by a registered medical practitioner (or “panel physician”) based on a criteria set by the resettlement state (Wickramage & Mosca, 2014). The purposes of these assessments are to support the health of migrating populations and strengthen understanding of the health profiles of diverse arriving populations (Mitchell et al., 2019). The results of the IME are used to inform a clinical course of action and connect refugees with appropriate health care professionals (general practitioners, dentists etc.). Several countries have recognized the burden of mental health among refugee populations, suggesting benefit for early screening and detection of common mental health conditions and linkage to care (CDC 2012; WHO, 2018; Hough et al., 2019). This proposal outlines a systematic review that could provide an evidence base and inform the implementation of a mental health assessment protocol within IMEs.

To date, several systematic reviews have focused on PTSD among refugees. However, the majority of these reviews focus on prevalence (Blackmore et al., 2020; Henkelmann et al., 2020; Peconga et al., 2020), access to care (Due et al., 2020), and psychological interventions (Crumlish & O'Rourke, 2010; Thompson et al., 2018). There is a limited evidence base focused on accurate and validated tools to assess PTSD in this population, and no reviews have been conducted, to our knowledge, for the purpose of informing IMEs. For example, two reviews described and characterized existing tools to measure trauma (Sigvardsdotter et al., 2016; Hollifield et al., 2002), but neither attempted to meta-analyze the diagnostic accuracy results. Another review of validated tools for PTSD reported a serious lack of validated tools for refugee children (Gadeburg et al., 2017). Our review aims to fill these gaps by synthesizing the published evidence on the diagnostic test accuracy of tools for PTSD among refugees of all ages. Further, it is widely recognized that culture is intimately connected to the symptomatology, identification, and treatment of mental health. This review will also examine the cultural considerations of the described screening approaches.

Research Question(s)

The objective of this systematic review is to assess the diagnostic test accuracy of screening tools for PTSD among refugees and asylum seeker populations, by addressing the following research question:

1. What is the diagnostic test accuracy of screening tools for PTSD among refugees and asylum seekers?

METHODS

This protocol was informed by the Cochrane Handbook for Systematic Reviews of Diagnostic Test Accuracy (Deeks et al., 2013) and the PRISMA-P (Moher et al., 2015) reporting guidelines (Appendix A). The final manuscript will be reported in accordance with the PRISMA extension for Diagnostic Test Accuracy reviews (PRISMA-DTA; McInnes et al., 2018).

Eligibility Criteria

Types of Studies

Primary studies assessing the diagnostic test accuracy of screening tools for PTSD in refugee and asylum seeker populations will be included. Prospective and retrospective cohort-selection cross-sectional study designs will be included (Mathes & Pieper, 2019). We will exclude diagnostic case-control designs, which are characterized by investigators recruiting disease-positive (ie, case) and disease-negative (ie, control) participants. Case-control design is prone to bias, potentially leading to inflated estimation of the diagnostic performance (Whiting et al., 2013; Park, 2018). We will include studies which report sensitivity and/or specificity. If measures of sensitivity and specificity are not reported, we will include studies which provide the data necessary to calculate them (e.g. extraction of a 2x2 table). For feasibility, studies in languages other than English, French, Spanish and Arabic will be excluded. No date limitation will be applied.

Participants

Screening tools must be used in refugee and/or asylum seeker populations of any age. Screening may be done in any geographical location and in any clinical setting. We will include articles that include refugees and/or asylum seekers among other population groups as long as subgroup data exclusive to refugee and/or asylum seeker populations is available.

Index Tests

Studies must assess and report the diagnostic accuracy of a screening tool. The term “screening tool” is inclusive of any questionnaire or checklist aiming to identify psychiatric symptoms. Screening tools may be self administered or administered by a clinical or non-clinical professional. It will be assumed that screening tools are validated as long as they have

undergone any form of development or processing by an organization (e.g. governmental, health authorities). A screening tool will be considered invalid if questions were not established before screening. Screening tools may be administered using any method of delivery (e.g. written or verbal, self-assessment or clinician-administered, etc) and at any point in time. The reference standard for diagnosis of PTSD is the clinical interview, but we will also include studies that compare screening tools to other diagnostic proxies.

Target Conditions

Screening tools must be administered with the intent to identify psychiatric or clinical symptoms of PTSD, as defined according to the criteria of either the DSM or the International Classification of Diseases (ICD). We will include studies which use the definitions from any published version of the DSM or ICD criteria. Studies which include screening tools for PTSD in addition to other psychiatric conditions will be included as long as the diagnostic test accuracy measures/data are available for the PTSD component independent from other conditions.

Information sources

We will develop a search strategy in consultation with a health sciences librarian to search the following bibliographic databases: Medline (Ovid), Embase (Ovid), PsycINFO (Ovid), CENTRAL (Ovid) and CINAHL (Ebsco). We will search from database inception up to present day. The search will consist of keywords and MeSH headings. We have elected not to search the grey literature, but will consult experts in the field and authors of included studies to identify other relevant literature. Additionally, we will screen the reference lists of relevant systematic reviews and consider their included studies against our eligibility criteria.

Search Strategy

We present a search strategy for Medline in Table 1 below. The search strategy will be translated for all proposed databases. The search strategies will be peer reviewed by a health scientist librarian in accordance with the PRESS guidelines (McGowan et al., 2016).

Table 1: Medline Search Strategy	
1	(refugee* or migrant* or resettle*).ti,ab,kw.
2	(forc* adj2 (displac* or migra*)).ti,ab,kw.
3	(asylum adj2 seek*).ti,ab,kw.
4	exp Refugees/
5	exp "Transients and Migrants"/
6	or/1-5
7	(screen or screening or questionnaire* or psychometric or test or tests or testing or tool or tools or instrument* or assess* or evaluation* or strateg* or diagnos* or protocol* or exam or exams or examination* or checklist*).ti,ab,kw.
8	(validit* or validat* or sensitiv* or specificit* or accuracy).ti,ab,kw.

9	Symptom Assessment/ 10 or/7-9 11 (ptsd or posttrauma* or post-trauma* or trauma or traumas).ti,ab,kw. 12 (stress adj2 disorder*).ti,ab,kw. 13 Stress Disorders, Post-Traumatic/ 14 or/11-13 15 6 and 10 and 14
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Data management and selection

We will use the review management tool *Covidence* (Veritas Health Innovation, 2019) to manage identified studies and facilitate title/abstract and full-text screening. A two-part study selection process will be used: (1) a title and abstract review and (2) full-text review. Two review authors will independently screen all potentially eligible studies against a priori inclusion and exclusion criteria. Conflicts will be resolved by a third-party if the two screeners cannot reach consensus. If we identify multiple reports of the same study, or multiple reports with overlapping population samples, we will include the most recent publication.

Data collection

We will develop a standardized extraction sheet containing all data items to be extracted. Two independent reviewers will extract data. They will compare results and resolve disagreements by discussion or with help from a third reviewer. In order to ensure the validity of the data extraction form, all reviewers will pilot test the extraction form with three studies. The accuracy of the content will be reviewed by a third reviewer, and differences will be resolved through discussion. Changes will be made to the extraction sheet, as needed.

Reviewers will extract the following variables: Publication and year, country, setting, study sample size, participant characteristics, reference standard, index test (screening tool), language(s), number and types of items/domains, response format/scale design, threshold for positivity (cut-off) and interpretation, target populations (child/adolescent/adult), developed for refugee populations (y/n), adapted for refugee populations (y/n), validated for refugee populations (y/n), description of cultural/linguistic elements, professional background/training of assessor, presence of interpreter (y/n), mode of administration, sensitivity/specificity/variance/2x2, study conclusions and implications for future research.

Critical appraisal of individual studies

We will critically appraise the methodological rigor of included studies using QUADAS-2 (Quality Assessment of Diagnostic Accuracy Studies 2). The QUADAS tool consists of 4 key domains that discuss patient selection, index test, reference standard, and flow of patients through the study and timing of the index tests and reference standard (Whiting et al., 2011). The QUADAS-2 tool is applied in 4 phases: summarize the review question, tailor the tool and produce review-specific guidance, construct a flow diagram for the primary study, and judge

bias and applicability. This tool will allow for more transparent rating of bias and applicability of primary diagnostic accuracy studies.

We tailored QUADAS-2 signalling questions for our review. We define a low risk of bias reference standard as a semi-structured clinical interview according to DSM or ICD criteria. Studies which used diagnostics proxies or other approaches will be considered high risk for bias. We also define an appropriate interval between screening with the index test and confirmation with the reference standard as ‘up to three months’. Two reviewers will apply QUADAS-2 independently. Consensus will be achieved through discussion or by involving a third reviewer.

We will not use QUADAS-2 data to form a summary quality score. Rather, we will produce a narrative summary describing numbers of studies for which we found high/low/unclear risk of bias, or concerns regarding applicability with corresponding tabular and graphical displays.

Statistical analysis and data synthesis

We will present an overview of all included studies in a narrative format with accompanying tables outlining details regarding population, clinical and geographic setting, index test, reference standard, cultural/linguistics characteristics and study quality.

We will use *Rev Man 5.3* to calculate sensitivity, specificity and 95% confidence intervals (CIs) from the two-by-two tables abstracted from the included studies (The Cochrane Collaboration, 2014). We will present individual study results graphically by plotting estimates of sensitivities and specificities as forest plots. To allow for a summary analysis, we will use *R* in addition to *Rev Man*. For studies which report sensitivity and specificity at a common threshold for positivity, we will use the bivariate approach to describe metrics of pooled sensitivity and specificity with corresponding 95% confidence intervals. We will plot summary data in a receiver operating characteristic (ROC) space, including 95% confidence regions. If studies do not use a common threshold, we will use hierarchical summary receiver operating characteristic (HSROC) models (Takwoingi et al., 2015). Heterogeneity that may be explained by clinical or methodological differences between studies may preclude meta-analyses, as will general sparsity of data or high risk of bias affecting most or all of the relevant studies.

If the data allow, we will perform sensitivity analysis based on risk of bias (e.g., removing “high risk of bias” studies from the analyses). Additionally, we will conduct subgroup analyses for the following subgroups:

- Population: The main analysis will consider ‘refugees and asylum seekers’ as a single group. If data allows, we will conduct separate analyses for ‘refugee’ and ‘asylum seeker’ groups.
- Population: We will stratify our analyses by age, separating studies conducted among children (early childhood 0-6 years), adolescents (7-17 years), and adults (18+ years), respectively.
- Population: We will stratify our results by gender, conducting separate analyses for data among women and men separately.

- Index test: The main analysis will consider all identified screening tools. We will conduct a subgroup analysis for each individual index test (e.g. by grouping all studies which use the Harvard Trauma Questionnaire).
- Index test: We will conduct separate analyses for self-administered and clinician-administered tests.
- Timing of assessment: Finally, we will conduct subgroup analyses for PTSD screening occurring pre-departure or post-arrival.

Reporting of Findings

This protocol was registered on the Open Science Framework and published online by Cochrane Equity Methods. The final systematic review report will be submitted for publication in an open-access peer-reviewed biomedical journal. Further, findings may be presented at conferences in collaboration with our government partners and academic partners. Finally, we will develop a non-technical summary to present research findings in a way that is accessible to a wide audience.

Patient engagement strategy

We have partnered with a patient representative from study onset to completion. Our patient representative has lived experience of resettlement and expertise in the field of mental health. We aim to include our partner in all decision making processes, as their perspective will shape the course of this review. Our patient representative was consulted in the writing of this protocol and was critical in the development of the inclusion criteria, search parameters and data extraction items. Additionally, our patient representative will be included in group discussions related to data synthesis, content analysis, and knowledge translation, such as the dissemination of research findings through the development of a non-technical summary.

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Appendix A. PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol

Section and topic	Item No	Checklist item	Page number
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	N/A
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	1
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	1
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	N/A
Support:			
Sources	5a	Indicate sources of financial or other support for the review	1
Sponsor	5b	Provide name for the review funder and/or sponsor	N/A
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	N/A
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	1,2
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	3
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	3-4
Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	4
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	4



Study records:			
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	5,6
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	4,5
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	5
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	6
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	6
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	5
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	5-6
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2 , Kendall's τ)	5-6
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	6
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	6
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	5
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	N/A

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**