

Creating HOPE: The Development of the HIV, Opioids and Pain Experience (HOPE) Screening Tool

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Abstract

Background: People living with HIV (PLWH) are more likely to experience chronic pain, trauma, and analgesic use than their HIV-negative counterparts. This complex chronic pain profile can have subsequent physical, mental, and psychological sequelae. Despite this, a tool to rapidly screen at risk patients and refer to specialized care has not been established. The purpose of this scoping review is to identify current screening tools for chronic pain, trauma, and opioid use to guide design of our comprehensive HOPE (HIV, Opioids and Pain Experience) screening tool.

Methods: A systematic search was conducted using a combination of controlled vocabulary and natural language keywords across four electronic databases to identify relevant peer-reviewed studies. Data extraction from eligible studies was then performed to summarize and organize findings according to the topic of the outcome measurement tool.

Results: A total of 10,573 abstracts were identified, 1,167 full-text articles reviewed, and 39 included for final data extraction. Among these articles, 31 screeners were identified for pain assessment, 8 for detecting opioid misuse, and 7 for trauma evaluation.

Discussion and conclusions: This study revealed tools for screening of chronic pain, trauma and opioid use described in the literature that can be used in the creation of an innovative screening tool for all the above in an HIV clinical context. All extracted tools demonstrated good validity and reliability, indicating their potential for inclusion in the development of a multidimensional screener for complex chronic pain among PLWH.

Keywords: Chronic Pain, HIV, Trauma

Introduction

Of the over 1 million adults and adolescents living with HIV in the United States, up to 85% are estimated to live with chronic pain: nearly eight times the rate of their HIV-negative peers [1,2]. Chronic pain is one of the most frequently reported symptoms in PLWH, and can have a drastic impact on HIV care retention, adherence to treatment, and patient quality of life, ultimately affecting daily functioning, overall physical

and mental health, and social and family relationships [1,3,4]. Even in the presence of HIV virologic control, pain can become chronic and persistent if underlying complexities associated with substance use, trauma, and/or mental health issues are also not identified and addressed. As a result, strategies to rapidly identify and refer to specialized care for PLWH who are at high risk for developing complex chronic pain as identified by Pullen and Nuñez [5] are essential to patient wellness.

Analgesic management in PLWH can be highly complex due to a high prevalence of mood disorders, substance abuse histories, hyperalgesia and polypharmacy in this population [6,7]. Persons living with HIV, particularly those with a history of trauma and/or substance use, may be at a higher risk for potential drug-drug interactions (pDDIs) between over-the-counter and prescription analgesics and ART [8]. In addition, despite -- or perhaps because of -- the proliferation of local, state, and national efforts to curtail opioid use disorder in the last decade [9]. PLWH are more likely than members of the general population to be prescribed opioids and to be given higher doses of opioids, putting them at increased risk for opioid use disorder [10].

Several studies have shown that PLWH with opioid use disorders tend to be less adherent to antiretroviral therapy than PLWH who do not use opioids, putting them at risk for virologic activation and ART resistance [11]. Furthermore, studies have found that self-reported levels of opioid usage remain the same in PLWH who have completed a course of chronic pain focused physical therapy, even when they report decreased pain and decreased usage of non-opioid analgesics (e.g., non-steroidal anti-inflammatory drugs, acetaminophen, and neuropathic pain medications) [5,9]. This highlights the importance of early detection of pain to avoid opioid initiation and misuse. Therefore, innovative HIV care delivery models that screens for pain and opioid use prior to a patient's initial HIV clinical encounter can have a potential for positive downstream effects including reductions in opioid initiation, increases in retention in care, and maintenance of viral suppression.

It is also important to note that chronic complex pain in PLWH can also be affected by exposure to traumatic events. Trauma is defined by the Substance Abuse and Mental Health Services Administration (SAMHSA) as "an event experienced by an individual physically or emotional harmful and/or life-threatening and that has lasting adverse effects on an individual's functioning and mental, physical, social, emotional, or spiritual well-being" [12]. It is estimated that 51-81% of all adults in high-income countries, such as the US, have experienced a minimum of one traumatic event. Of these, a significant number report, experiencing multiple traumatic events throughout their lifetime [13]. There is an even higher prevalence of trauma among PLWH: one study estimates that 68% - 98% of women, 68% - 77% of men, and 93% of transgender people with HIV within the United States have experienced some sort of trauma, with 30% of all HIV infected individuals experiencing physical and/or sexual abuse before the age of 13 [13]. Post-traumatic stress disorder (PTSD) among PLWH is as high as 74% compared to only 8% among the general US population [14]. PLWH who have experienced trauma are more likely to experience a higher incidence of pain, more pain conditions, and increased severity of pain in comparison to their HIV-negative counterparts: up to 50% of PLWH with chronic pain report having PTSD in comparison to only 6-12% of their HIV negative counterparts [14,15]. While

this likely has a multifaceted etiology, these discordant rates may be at least partially attributed to lower thresholds for physiologic pain found in people with both chronic pain and trauma exposure [16].

The extent to which validated screening and assessment tools have been used to better direct and coordinate care of PLWH with complex chronic pain (CCP) is unknown. The purpose of this scoping review is to identify and summarize existing validated measurement tools currently used to screen for and assess chronic pain, trauma, and analgesic use in adults over 18 years of age. A scoping review is an appropriate synthesis strategy for this research, as an approach to identify and describe existing validated assessment and screening tools used by a range of primary and interdisciplinary healthcare settings [17]. Data from this scoping review will be used to identify and synthesize items/questions that assess and screen for biopsychosocial factors of chronic pain, trauma, and analgesic use, which will further inform the development of a multidimensional screening tool for CCP among PLHIV.

Methods

Eligibility criteria

This review aimed to find and assess all validation studies of tools that measure and screen chronic pain, trauma, and analgesic use in adults. Studies included were those of current validated tools; studies that include validation of initial measurement tools and adaptations of tools for other populations; and studies that include psychometric measurement data of measurement tools. Excluded reports include tools that are proposed but not validated; studies reporting outcome measurement changes following intervention or assessment but that do not contribute to the validation of the outcome measure; studies involving diagnostic criteria; validation of existing tools to languages other than Spanish or English; studies on pain sequelae to surgical interventions, oncological interventions, acute physical trauma, and central diagnoses of central post stroke pain, spinal cord injury, traumatic brain injury, Parkinson's disease, or multiple sclerosis. Studies published in a language other than English or Spanish were excluded, as well as studies of measurement tools involving the use of artificial intelligence. The eligibility criteria are also represented in **Table 1**.

Literature search

A systematic search was developed by a health sciences librarian (ER) using a combination of controlled vocabulary and natural language keywords. The search strategy encompassed the concepts of the measurement of chronic pain, psychological trauma, and analgesic use and misuse. Additional keywords to identify validation studies, as well as the "Validation Studies" study type (in applicable databases) were used. The search strategy was developed in Ovid

Table 1. Eligibility criteria.		
Eligibility criteria		
PCC Question	Inclusion Criteria	Exclusion Criteria
Population	Adults of and higher than the age of 18	Pediatric patients under the age of 18
Intervention/Exposure	Current validated measurement tools used by interdisciplinary healthcare providers to assess and screen chronic pain, trauma, and analgesic use.	Tools not validated (proposed only)
	Studies that include validation of measurement tool, initial and adapted for other populations not in exclusion criteria.	Studies reporting outcome measurement changes following intervention or assessment but do not contribute to validation of outcome measure.
	Studies that include psychometric measurement data of measurement tool.	Studies involving diagnostic criteria contributing to definitions for Diagnostic and Statistical Manual of Mental Disorders.
		Validation of existing tools to other language other than Spanish or English.
Outcome	List of items/questions on the tool, or link/ method to access items	Studies on pain sequelae to the following: surgical interventions oncological interventions acute physical trauma central diagnoses: Central post stroke (CVA) pain, Spinal Cord Injury, Traumatic Brain Injury, Parkinson's disease, or Multiple Sclerosis.
		Survey unavailable (e.g. cost to obtain survey, original survey written in language other than Spanish or English) Outcome measurement does directly involve single topic or any combination of chronic pain, behavioral health/trauma, and analgesic use
		Objective measurement tool used in combination with data from larger inventory that does not meet inclusion criteria.
Others		Surgery Artificial intelligence
Languages	Spanish & English	

MEDLINE and then translated to and executed across four additional databases: Scopus, CINAHL, PsycInfo, and the Cochrane Library, from their inception to November 8, 2023. The full search strategies for all databases can be found in (Appendix 1).

Study selection

Search results from all databases were compiled and deduplicated in by ER [18], then imported into Covidence [19] for additional deduplication and screening. Records were screened independently by two individual reviewers each against the eligibility criteria (CC, JF, MF, and YW). Conflicts

were resolved through a tie-breaking vote from AN or SP. Full texts were then screened independently by two individual reviewers each and conflicts resolved in the same fashion as described for the title/abstract screening. Because individual screening tools could appear in several reports, an additional screening step (by AN) was added by choosing from the set of full-text inclusions one validation study for each identified measurement tool. At this point, tools were excluded if they were unavailable due to cost to obtain survey or if the survey was written in a language other than English or Spanish. Data extraction was then conducted on this final set of included reports. The screening and inclusion process is shown in Figure 1.

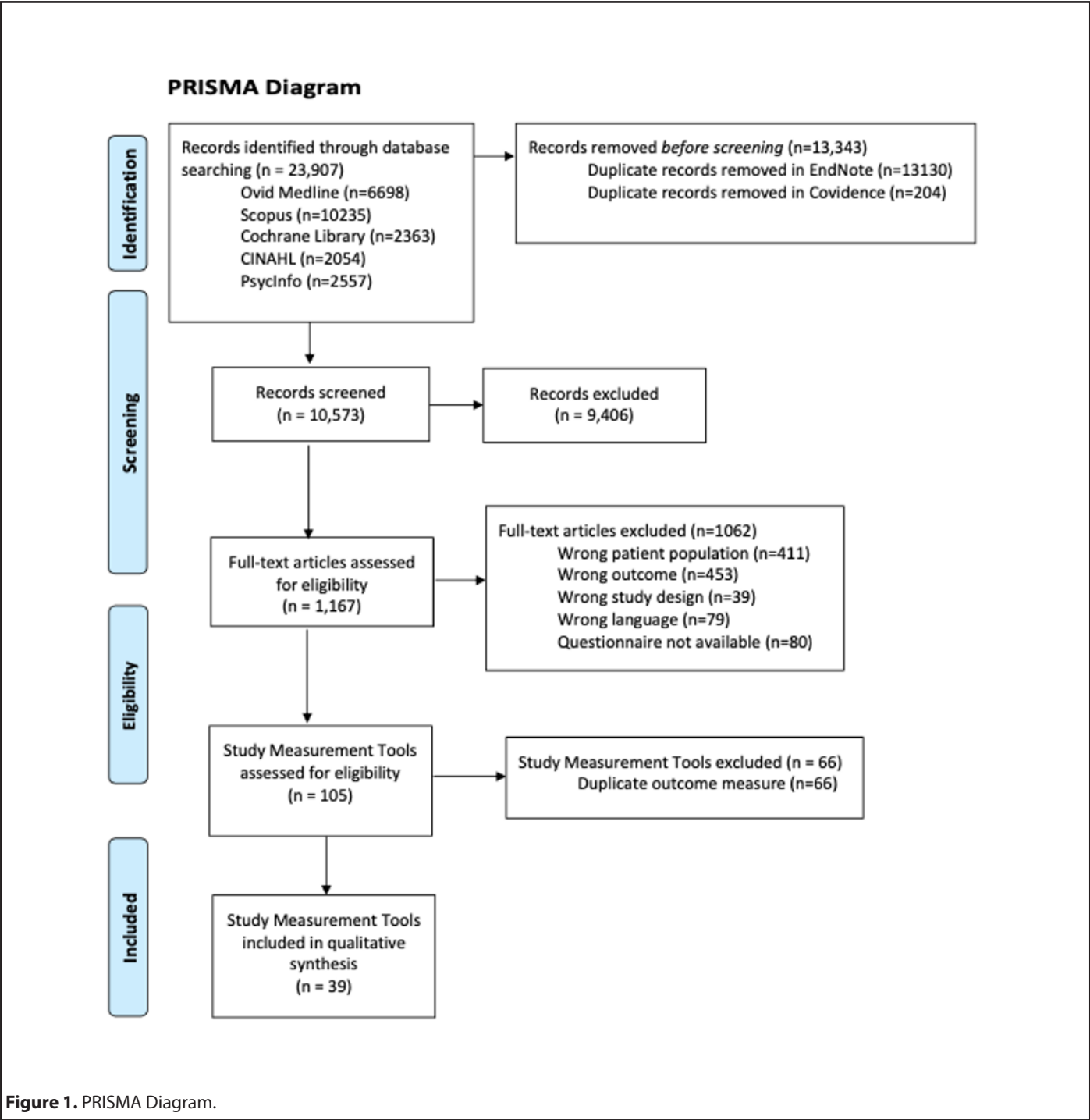


Figure 1. PRISMA Diagram.

Data collection

Data related to the screening and assessment of chronic pain, opioid use and trauma was extracted using the data-charting form developed in Covidence. Data from included studies was systematically charted using the data charting form developed in Covidence. Information on authorship, article type, population, title, and topic of outcome measurement tool(s) identified in the study and population target for measurement tool(s) were recorded on this form. Copies of measurement tool(s) for each of the included studies were

obtained and information in measurement tool(s) instructions and scoring type, and item/questions were entered into the extraction form.

Data synthesis

Information on the data charting form was organized and summarized with respect to the outcome measurement tool topic(s): chronic pain, behavioral health/trauma, analgesic usage, or some combination of these three main topics.

Results

The initial search revealed 10,777 articles with 204 duplicates resulting in 10,573 distinct potential articles. The article titles and abstracts were then screened against inclusion and exclusion criteria by two reviewers, resulting in 1,167 articles for full-text review. Out of the 1,167 full-text studies, 665 studies met inclusion criteria. A secondary full-text assessment was performed to assess specific screening tools against inclusion and exclusion criteria and to exclude duplicate screening tools, resulting in 39 studies for data extraction (**Figure 1**). During this de-duplication process, studies were excluded for the following reasons: 1) outcome measurement does directly involve single topic or any combination of chronic pain, behavioral health/trauma and analgesic use, 2) survey

unavailable (e.g. cost to obtain survey, original survey written in language other than Spanish or English), 3) wrong population (e.g. adolescents, post-surgical, pain sequelae to other known disorders or surgery, behavioral health/trauma sequelae or as part of diagnosis for behavioral disorder (e.g. diagnostic for depression, anxiety), and 4) objective measurement tool used in combination with data from larger inventory.

Out of the final 39 articles, 31 tools were identified for assessment of chronic pain, 8 for the detection of opioid/medication misuse, and 7 for the evaluation of trauma. Totals add up to more than 39, as some tools addressed two topics within one tool such as opioids and chronic pain. A summary of these tools is shown in **Table 2**.

Table 2. Synthesized data table.		
Article	Tool Included	Domain Assessed
Jones 2014 [20]	Brief Risk Interview (BRI)	Analgesic usage
Jones 2014 [20]	Opioid Risk Tool (ORT)	Analgesic usage
Jones 2014 [20]	Screener and Opioid Assessment for Patients with Pain-Revised (SOAPP-R)	Analgesic usage
Carmona 2018 [21]	Adjective Rating Scale for Withdrawal (ARSW)	Analgesic usage
Carmona 2023[22]	Prescription Opioid Misuse Index (POMI)	Analgesic usage
Martel 2014 [23]	Opioid Misuse Measure	Analgesic usage
Buelow 2009 [24]	Revised, shortened version of the Pain Medication Questionnaire (PMQ)	Analgesic usage
Castillo 2010 [25]	Severity-of-Dependence-Scale SDS	Analgesic usage
Barke 2015 [26]	Psychological Inflexibility in Pain Scale (PIPS)	Chronic Pain
Barke 2015 [26]	Psychological Inflexibility in Pain Scale (PIPS)	Chronic Pain
Bianchini 2014 [27]	Pain Disability Index (PDI)	Chronic Pain
Nicholas 2015 [28]	Pain Self-Efficacy Questionnaire (PSEQ) 10-item	Chronic Pain
Nicholas 2015 [28]	PSEQ-2	Chronic Pain
McCracken 2004 [29]	Chronic Pain Acceptance Questionnaire (CPAQ)	Chronic Pain
Wassinger 2021 [30]	Orebro Musculoskeletal Pain Questionnaire (OMPQ)	Chronic Pain
Bruehl 2016 [31]	Pain Catastrophizing Scale (PCS)	Chronic Pain
Richards 1982 [32]	UAB Pain Behavior Scale	Chronic Pain
Burton 1999 [33]	Basic Personality Inventory (BPI)	Chronic Pain
Burton 1999 [33]	Multidimensional Pain Inventory (MPI)	Chronic Pain
VanWyngaarden 2019 [34]	Targeted Treatment Back Screening Tool (SBT)	Chronic Pain
VanWyngaarden 2019 [34]	Optimal Screening for Prediction of Referral and Outcome Yellow Flag (OSPRO-YF)	Chronic Pain
Carlsson 1984 [35]	Pain questionnaire evaluation	Chronic Pain
AlBanyan 2021[36]	Short-Form McGill Pain Questionnaire (SF-MPQ)	Chronic Pain
Waterman 2010 [37]	Pain Quality Assessment Scale (PQAS)	Chronic Pain
Mittinty 2022 [38]	Fear of Pain Questionnaire (FPQ-9)	Chronic Pain
Lippe 2016 [39]	Pain Disability Questionnaire	Chronic Pain

Cuesta-Vargas 2020 [40]	The Fear-Avoidance Components Scale (FACS)	Chronic Pain
Kleinstaubner 2023 [41]	Biopsychosocial Model of Chronic Pain (PEB) Scale	Chronic Pain
Neblett 2015 [42]	Tampa Scale for kinesiophobia (TSK)	Chronic Pain
Gagnon 2023 [43]	Patient-Specific Functional Scale (PSFS)	Chronic Pain
Larsen 1997 [44]	Pain Anxiety Symptoms Scale (PASS)	Chronic Pain
McCracken 2010 [45]	Brief Pain Response Inventory (BPRI)	Chronic Pain
VonKorff 2019 [46]	Graded Chronic Pain Scale-Revised	Chronic Pain
Enebo 1998 [47]	The Quebec Back Pain Disability Scale	Chronic Pain
Roelofs 2003 [48]	pain vigilance and awareness questionnaire (PVAQ)	Chronic Pain
Freyenhagen 2006 [49]	painDETECT questionnaire (PD-Q)	Chronic Pain
Main 1983 [50]	Modified Somatic Perceptions Questionnaire	Chronic Pain
Ruscheweyh 2012 [51]	Pain Sensitivity Questionnaire	Chronic Pain
Torrance 2009 [52]	36-Item Short Form Survey (SF-36)	Chronic pain
Ball 2015 [53]	Short-Form Health Survey (SF-12) scores (physical and mental components)	Trauma
Geisser 1997 [54]	Beck Depression Inventory (BDI)	Trauma
Geisser 1997 [54]	Center for Epidemiological Studies-Depression Scale (CES-D)	Trauma
Cann 2011 [55]	Event Related Rumination Inventory (ERRI)	Trauma
Green 2006 [56]	Stressful Life Events Screening Questionnaire (SLESQ)	Trauma
Chavez 2017 [57]	The AC-OK Screen for Co-Occurring Disorders	Trauma
deBont 2015 [58]	Trauma Screening Questionnaire	Trauma

Discussion

Chronic pain management in PLWH presents unique challenges due to the interplay of biological, psychological, and social factors. Beyond the physical manifestations of HIV, individuals may also contend with comorbidities, including substance use disorders, mental health conditions, and histories of trauma. These factors not only contribute to the experience of chronic pain but also complicate its management. For instance, PLWH may experience heightened levels of pain due to neuropathy associated with HIV [59], while also struggling with psychological distress stemming from stigma, discrimination, and past traumatic experiences.

The scoping review identified a wide range of measurement tools validated for screening chronic pain, trauma, and analgesic use in the adult population. The extensive search process and strict eligibility criteria ensured all included studies are relevant to the research question. However, our results indicated a scarcity of screeners for detection of analgesic medication misuse and psychological trauma among patients. This gap in available resources poses significant difficulty for healthcare providers striving to deliver comprehensive and individualized interventions to effectively manage chronic pain in PLWH.

It is also noted that while the existing tools cover a range of psychosocial constructs related to chronic pain, including

catastrophizing, vigilance, and fear avoidance behaviors, there remains a notable need to place trauma assessment tools unto further psychometric property analysis. This rigorous evaluation would not only further ensure their validity but also their sensitivity and specificity in capturing the interplay between psychological trauma and chronic pain experiences.

Implementing validated screening tools for chronic pain, trauma, and analgesic use in clinical settings holds significant promise for improving patient outcomes. Therefore, the next phase of research should focus on developing new tools that address the unique needs of PLWH with chronic pain, utilizing applicable items included in the current screeners summarized above. It is also essential to consider practical considerations such as ease of use, accessibility, and applications across different healthcare disciplines to ensure the effective implementation of these tools in routine practice. Collaborative efforts between researchers, clinicians, and affected communities will be crucial in driving forward this agenda and ultimately improving the quality of care for PLWH living with chronic pain.

Conclusion

This scoping review provides a comprehensive overview of the validated measurement tools available for screening chronic pain, trauma, and analgesic use among adults, with a specific focus on PLWH. The findings highlight the

diversity of existing tools and emphasize the importance of multidimensional assessment approaches that address the complex connections between chronic pain, trauma, and opioid use.

The development of a multidimensional screening tool tailored to the needs of PLWH is warranted. This tool would allow healthcare providers to identify and address the unique challenges faced in this population with the goal of improving patient outcomes and quality of life. Continued research and collaboration in this research are required for advancing the field of chronic pain management regarding HIV care.

Limitations

Several limitations should be noted. First, despite the rigorous search strategies used, it is possible that some relevant studies may have been missed. Of note are studies that were published in languages other than English or Spanish. Additionally, the inclusion criteria focused on only measurement tools which have been validated. This potentially excludes studies that could be valuable but are utilizing unvalidated tools. These limitations should be considered when interpreting the findings of this scoping review.

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Data Availability Statement

The data that supports the findings of this study are available on public domains that include the peer reviewed articles included in the review. These data were derived from the resources available in Ovid MEDLINE and then translated to and executed across four additional databases: Scopus, CINAHL, PsycInfo, and the Cochrane. These are all public domains.

Conflicts of Interest

The authors declare no conflicts of interest.

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