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Two fundamental supportive invasive interventions in the critical care environment are mechanical ventilation and intravenous therapy. Ventilation research has dominated the literature since the pandemic began, with little research on vascular access devices, despite these interventions existing almost co-dependently.

The systematic proning of this cohort of patients increases the risk of dressing infiltration and infection¹. Vascular access devices, and the coagulopathic manifestations of Covid-19, place these patients at a heightened risk of complications².

Therefore, our activity regarding vascular access device insertion, care and maintenance in a critically ill Covid-19 population must be understood to investigate whether this population is at an increased risk of vascular access device complications and vessel health compromise.



The main objective of this scoping review is to conduct a systematic search of both peer-reviewed and grey literature to examine how research is conducted.

In doing so, identify the types of evidence available, knowledge gaps and key concepts on vascular access approaches in patients with Covid-19 in ICU.

Design: *scoping review*

The Joanna Briggs Institute (JBI) three-step approach was followed to undertake a systematic search using databases and search engines EMBASE, Medline, CINAHL, PubMed and clinical trials registries., from 2019 to March 2022.

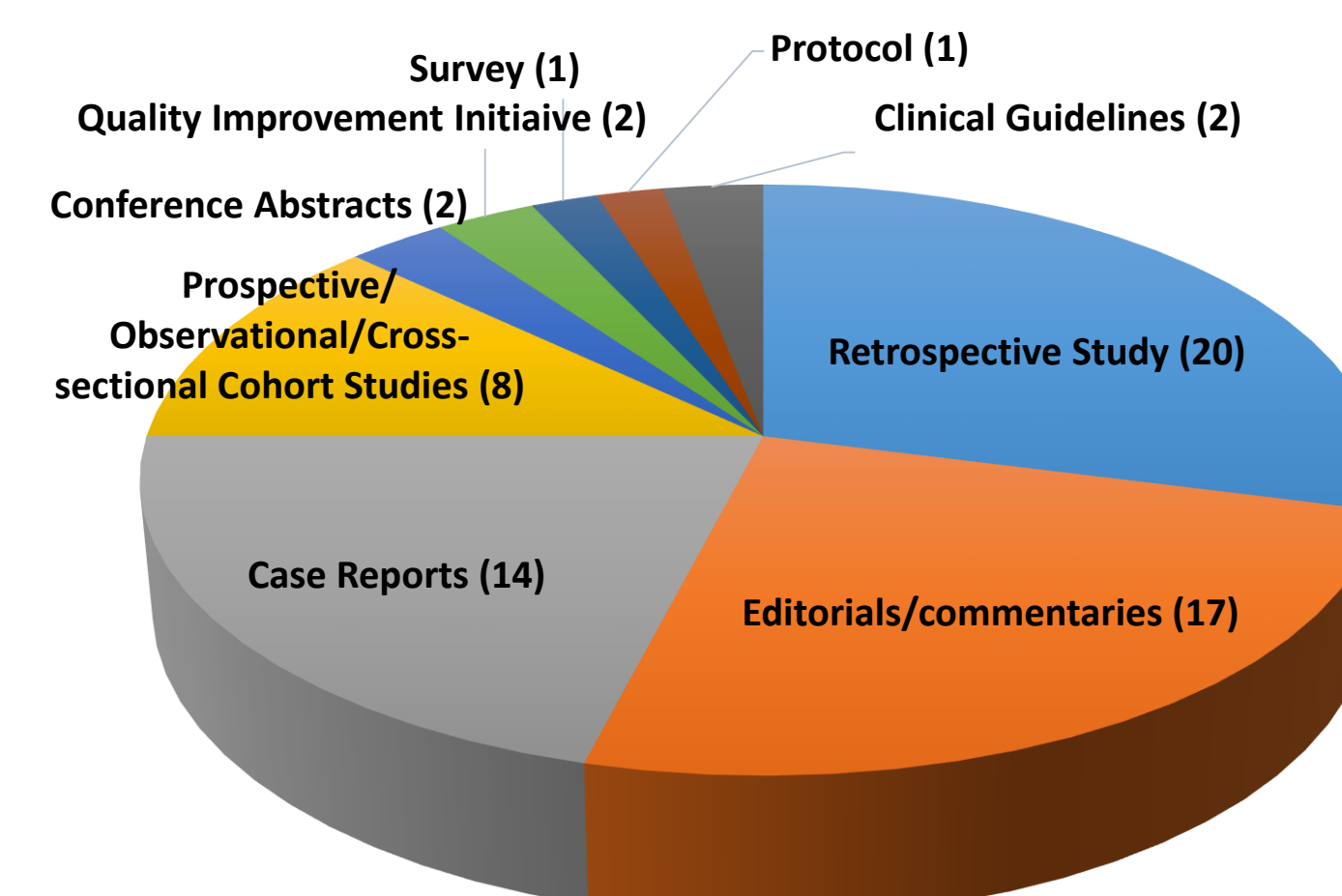
Our data extraction instrument was developed using a template from JBI to provide a map and basic summary of the evidence available regarding approaches to VA selection, insertion, care and maintenance in critically ill patients with covid-19.

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The PRISMA-ScR checklist was used to report findings

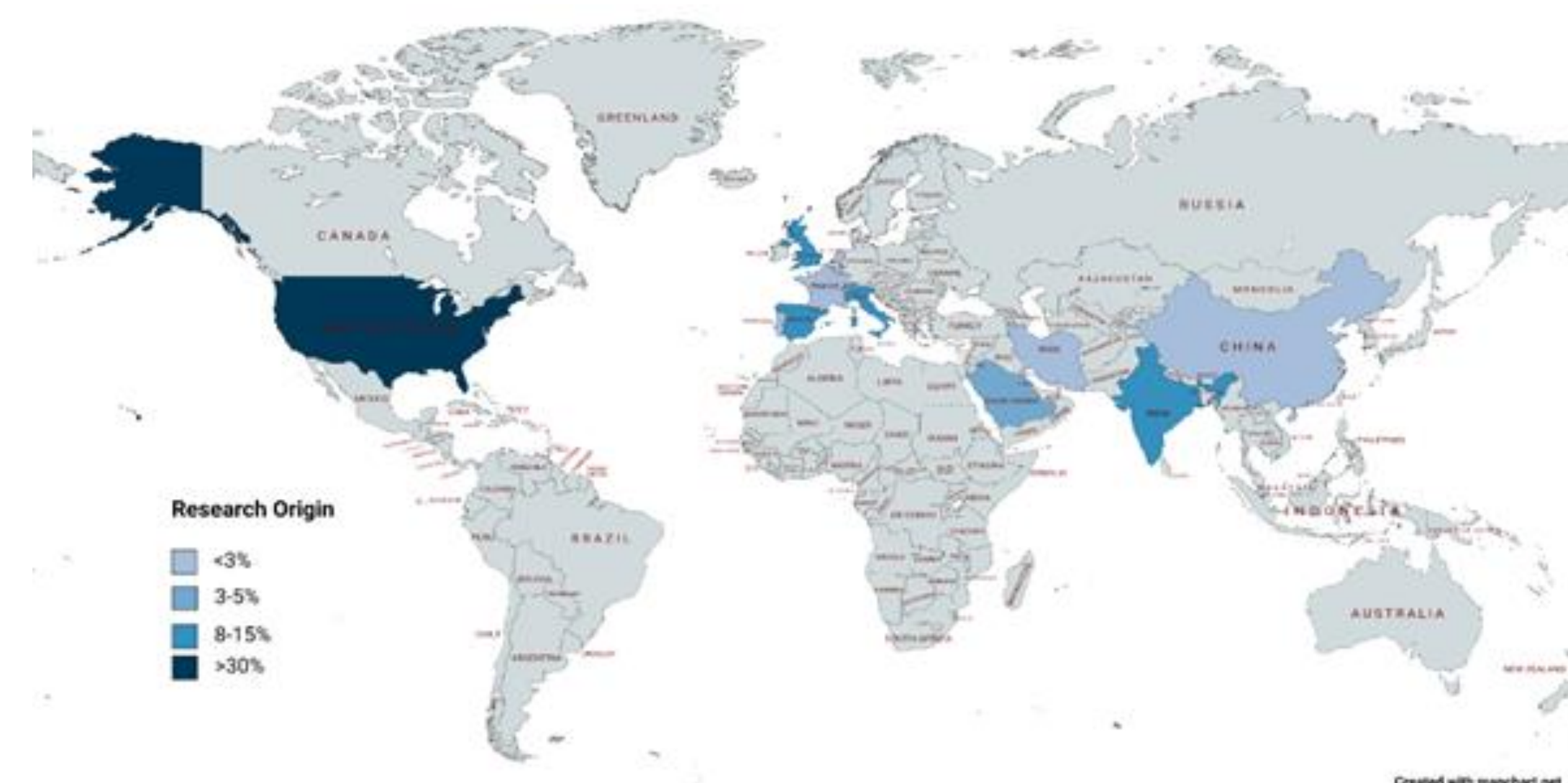
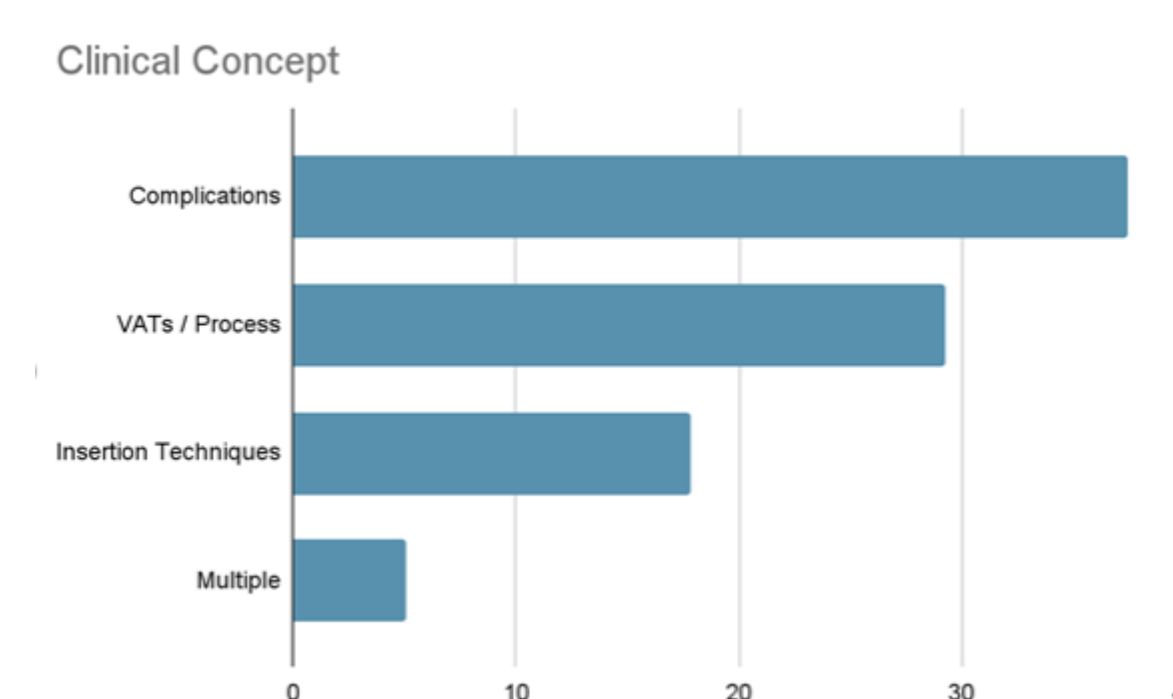
Study Design

A total of 5107 results were identified. From this number, data was extracted from 67 papers. Study designs are represented in the figure below. No randomised controlled trials were identified. No clinical trials, registered or ongoing, were identified.



Country of origin

At the beginning of this scoping review we also set out to map where literature was being published and what countries were disseminating most of the literature on vascular access in this cohort. From the results synthesised in the infographic shown below, the United States has been the front runner in the publication of literature on vascular access during the pandemic. Italy has also contributed a large amount of research, with Spain, India and the United Kingdom following suit.



Clinical concept

Identifying key concepts in the literature surrounding vascular access in this cohort of patients was a major reason for the completion of this scoping review. Of the clinical concepts identified, the main themes reoccurring were complications, vascular access teams (VATs) and insertion techniques such as point of care ultrasound (POCUS).

An analysis of the results showed that the main types of literature being published on this topic are retrospective cohort studies. A significant amount of research identified were editorials, commentaries and case reports describing experiences or complications.

Current data findings appear inconsistent at best and, therefore, difficult to compare and analyse. Although evidence translation is not the purpose of a scoping review, it is difficult to imagine how vascular access research can evolve and advance without an agreed standardised set of minimum outcomes among researchers and clinicians.

Remarkably little literature was identified on site selection, insertion techniques and device care and maintenance in Covid-19. As well as a lack of consensus around site location, agreement around VAD type was also scarce in the results.

Two of the results identified are from expert groups offering clinical guideline recommendations³⁻⁴ for the device type, insertion site and general care and maintenance of VADs in this cohort of patients. Despite VA recommendations being in existence, the basis for these must be considered when no randomised controlled trials, systematic reviews or meta-analysis exist to support these recommendations.

The foundation of evidence-based practice depends on the integration of valid research alongside clinical expertise. Future research needs to focus on high quality randomised controlled trials.

This scoping review has highlighted the need for further research surrounding approaches to vascular access in the Covid-19 positive ICU population.

Findings suggest that vascular access research has scarcely been an afterthought in the research world, particularly in light of the volumes of evidence available on mechanical ventilation.

A systematic review and meta-analysis is, at present, unnecessary

References & Supporting Info

