

# BMJ Open Screening, diagnosis, treatment and outcomes of developmental dysplasia of the hip in Brazilian population: a scoping review protocol

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## ABSTRACT

**Introduction** Developmental dysplasia of the hip (DDH) includes a spectrum of clinical and imaging findings at birth or early infancy. The circumstances in which this condition is detected and managed may be heterogeneous in Brazil owing to its large territory and regional socio-economic differences. Mapping DDH perspectives in a country is fundamental for designing guidelines and strategies for public policy. This scoping review aims to map the available literature related to screening, diagnosis, treatment and outcomes of DDH in the Brazilian population to provide an overview of this condition and to describe regional variations in presentation and management across the country.

**Methods and analysis** This study will follow the methods outlined in the Joanna Briggs Institute Reviewers manual for conducting a scoping review. Relevant publications will be first searched in PubMed/MEDLINE, Scientific Electronic Library Online, Web of Science, Scopus, "Biblioteca virtual em saúde" and "Biblioteca Digital Brasileira de Teses e Dissertações" using search terms developed from a brief preliminary search of those databases. There were no language or date range limitations for study inclusion. Databases will be searched from their inception until February 2024. Titles and abstracts will be analysed by two or more independent reviewers to assess them against the inclusion criteria for the review. The search results and study inclusion process will be reported in full in the final version of the scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping review (PRISMA-ScR) flowchart. The resulting data will be recorded and organised to present the key information contained in all examined articles.

**Ethics and dissemination** This review will include existing available studies and does not require a specific ethical review or approval. The final study will be submitted for presentation at conferences that focus on Brazilian healthcare and publication in peer-reviewed journals. This scoping review protocol was registered in the Open Science Framework. DOI registration (<https://doi.org/10.17605/OSF.IO/V3AYH>).

## INTRODUCTION

Developmental dysplasia of the hip (DDH) includes a spectrum of hip findings at birth or infancy, including congruent hips with dysplastic acetabulum, unstable hips

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This will be the first scoping review to study developmental dysplasia of the hip specifically in the Brazilian population.
- ⇒ A rigorous framework for designing and conducting a scoping review developed by the Joanna Briggs Institute will be applied in the production of this study.
- ⇒ This scoping review may not be able to identify all studies in grey literature despite attempts to be as comprehensive as possible.

or frankly dislocated hips.<sup>1</sup> DDH can be syndromic-associated but is otherwise a condition of a healthy child at an incidence of 1% to 2% per newborn child but may vary depending on the population and screening methods considered.<sup>2–3</sup> The general treatment goal for DDH is to achieve and maintain a concentric reduction of the femoral head in the acetabulum.

Diagnosing DDH is challenging, as it may not be noticeable and is typically asymptomatic at birth, therefore may go undetected during initial screening. The gold standard of diagnosis is a clinical examination with associated imaging, and ultrasound has been the best choice in the age group up to 6 months of age.<sup>4–7</sup> The availability and reliability of ultrasound in areas with limited resources are unknown.<sup>8–10</sup>

Screening for DDH includes programmes that use universal or selective ultrasonography in the newborn population. Universal screening may lead to overdiagnosis and overtreatment, without reducing the occurrence of late detection and operative treatment.<sup>4</sup> There is a lower incidence of delayed diagnosis in countries with wide availability of ultrasound.<sup>11</sup> In developing countries, ultrasound examinations continue to be challenging, because of the lack of experienced

professionals to perform the examination and restricted access to ultrasound devices.<sup>12</sup>

Failure to make an early and timely diagnosis hinders the possibility of non-surgical treatment.<sup>13–15</sup> The later the diagnosis, the greater the need for increasingly extensive corrective surgeries, which leads to poorer outcomes including pain, disability and the development of osteoarthritis. Underserved regions may treat their children at a later age and consequently have more sequelae.

Brazil is a country of continental dimensions, divided geographically into five regions with major socio-economic differences between them and within themselves. These differences are shown in the divergent health resources available in each area and the healthcare provided to the population. Approximately 75% of the Brazilian population has no access to private healthcare and relies exclusively on the Brazilian Unified Health System (SUS), which is the largest public and universal healthcare system in the world.<sup>16</sup>

This scoping review aims to map the available literature related to screening, diagnosis, treatment and outcomes of DDH in the Brazilian population to provide an overview of this condition and to describe regional variations in presentation and management across the country. Moreover, knowledge of regional differences in the availability of screening tests is pivotal for advising and implementing guidelines for the screening and diagnosis of DDH in Brazil. This can provide valuable information to public authorities for developing policies regarding DDH. A scoping review is suitable for summarising and disseminating research findings and identifying research gaps in existing literature.<sup>17</sup> A preliminary search of MEDLINE, Cochrane Database of Systematic Reviews and JBI Evidence Synthesis was conducted. No current or ongoing systematic reviews or scoping reviews on the topic were identified.

### Review question

This scoping review will explore the available literature on DDH in the Brazilian population to investigate variations in screening, diagnosis, treatment and outcomes across the country.

### Keywords

Developmental dysplasia of the hip, congenital hip dislocation, developmental dysplasia, DDH, hip dysplasia, Brazil.

## METHODS

### Eligibility criteria

#### Participants

The current scoping review will consider studies that include paediatric patients aged 0–18 years who have a diagnosis of DDH.

### Concept

The concept of the proposed scoping review involves the screening, diagnosis, treatment and/or outcomes of DDH.

### Context

This review will include published and unpublished studies that were related to the Brazilian population, without restrictions on the language or date of publication.

### Types of sources

This scoping review will consider both experimental and quasi-experimental study designs including randomised controlled trials, non-randomised controlled trials, before-and-after studies and interrupted time-series studies. In addition, analytical observational studies including prospective and retrospective cohort, case-control and analytical cross-sectional studies will be considered for inclusion. This review will also consider qualitative data and descriptive observational study designs including case series with more than 10 patients and descriptive cross-sectional studies. In addition, systematic reviews that meet the inclusion criteria will be considered, depending on the research question. Grey literature, such as unpublished studies and government data, will be considered for inclusion in this scoping review, as well as text and opinion papers.

### Search strategy

The search strategy will aim to identify published and unpublished studies. An initial limited search of the MEDLINE/PubMed and Latin American databases was performed to identify articles on the question presented in this paper. The keywords contained in the titles and abstracts of relevant articles and the index terms used to describe the articles were used to develop a full search strategy for the databases. The search strategy included the following keywords and their translation to Portuguese based on DeCS translation for MeSH terms: “Developmental dysplasia of the hip”; “Congenital hip dislocation”; “Developmental dysplasia”; “DDH”; “Hip dysplasia”; “Brazil” and adapted for each database or information source. Databases will be searched from their inception until February 2024. Online supplemental appendix I presents the full search strategy. The reference list of all included sources of evidence will be screened for additional studies. There were no language or date range limitations for study inclusion.

The databases to be searched include “Biblioteca virtual em saúde”, Scientific Electronic Library Online, Web of Science, Scopus and PubMed/MEDLINE. Sources of unpublished studies/grey literature to be searched include “Biblioteca Digital Brasileira de Teses e Dissertações”.

### Study/source of evidence selection

Following the search, all identified citations will be organised and uploaded to Rayyan, a web-based systematic review tool designed to streamline the process of

managing and synthesising research literature.<sup>18</sup> Duplicates will be identified and removed to ensure data integrity and accuracy. Selected articles will then be analysed by two or more independent reviewers to assess them against the inclusion criteria for the review. Potentially relevant sources will be retrieved in full, and their citation details will be imported into a data abstraction table developed by the research team. The full texts of the selected citations will be assessed in detail against the inclusion criteria by two or more independent reviewers. The reasons for excluding full-text evidence sources that do not meet the inclusion criteria will be recorded and reported in the scoping review. Any disagreements between reviewers at each stage of the selection process will be resolved through discussion, or by additional reviewers. The search results and study inclusion process will be reported in full in the final version of the scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping review (PRISMA-ScR) flow diagram.<sup>19</sup>

### Data extraction

Data will be extracted from the articles included in the scoping review by two or more independent reviewers, using an online spreadsheet. We will organise the data separated into four categories according to the objectives of this study: screening, diagnosis, treatment and outcomes. The following data points will be collected from each article: (1) study title; (2) authors; (3) publication year; (4) study design; (5) number of patients; (6) level of evidence study using the Oxford Centre for Evidence-Based Medicine level of evidence; (7) region of Brazil from where the population was the object of the study and (8) healthcare setting of the study: public or private. We will discuss relevant topics according to each category.

- ▶ Screening: fetal presentation for birth; sex; other conditions (twin pregnancy, metatarsus adductus and congenital torticollis), family history of DDH; clinical examination at birth; considered risk factors and criteria for indicating selective ultrasonography.
- ▶ Diagnosis: age; how the diagnosis was assessed; the incidence of the condition in the population of the region of the study; usage of ultrasound, X-ray or a combination for diagnosis; clinical examination by a general practitioner; clinical examination by a specialist; late diagnosed DDH and prolonged post-natal positioning, such as swaddling.
- ▶ Treatment: age at which treatment began; time between diagnosis and treatment; treatment strategies (conservative or surgical); type of non-surgical treatment; incidence of closed reduction and incidence of open reduction.
- ▶ Outcomes: incidence of successful closed reduction; occurrence of other adverse events arising from pre-reduction hip traction; incidence of residual subluxation postoperatively; incidence of avascular necrosis of the femoral head and/or neck postreduction;

incidence of acetabular dysplasia and incidence of secondary procedures.

The prototype data extraction tool will be modified and revised as necessary while extracting data from each included evidence source. The modifications will be specified in the scoping review. Any disagreements between reviewers will be resolved through discussion, or with one or more additional reviewers. If appropriate, the authors of the articles will be contacted to request for missing or additional data when necessary.

### Data analysis and presentation

The extracted data from the included papers will be presented in tabular and graphical forms to analyse and summarise the results. The tabulated and/or charted results will be accompanied by the article's production context, which will be briefly summarised to provide elements to discuss differences between the regions of Brazil regarding socio-economic conditions and resource availability. The data will be presented graphically, relating the article category and its year of publication and generating a visual representation of the distribution of the included papers. We will report findings in line with the 'Preferred Reporting Items for Systematic Reviews and Meta-Analysis: extension for Scoping Reviews' checklist.

### Patient and public involvement

Patients and the public were not involved in the design of this protocol and will not be involved in reporting, conducting or dissemination plans of this scoping review.

### ETHICS AND DISSEMINATION

This review will include existing available studies and does not require a specific ethical review or approval. The final study will be submitted for presentation at conferences that focus on Brazilian healthcare and publication in peer-reviewed journals. This scoping review protocol was registered at Open Science Framework. DOI registration (<https://doi.org/10.17605/OSF.IO/V3AYH>).

**Contributors** The authors confirm their contribution to the paper as follows: study conception and design: PMG and ES; draft manuscript preparation: PECMRJ and PMG; search strategy development: PECMRJ, SL and SA; review and comment on the manuscript: ES and DL. PMG is the guarantor of this paper. All authors reviewed and approved the final version of the manuscript.

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**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

**Patient consent for publication** Not applicable.

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## Appendix I: Search strategy

### *PubMed search syntax*

*("displasia"[All Fields] OR "displasias"[All Fields]) AND "desenvolvimento"[All Fields]  
OR "DDQ"[All Fields] OR ("displasia"[All Fields] OR "displasias"[All Fields]) AND  
"quadril"[All Fields])*

*(((((("displasia"[All Fields] OR "displasias"[All Fields]) AND "desenvolvimento"[All Fields]  
AND ("brazil"[MeSH Terms] OR "brazil"[All Fields] OR "brazil s"[All Fields] OR  
"brazils"[All Fields])) OR "DDQ"[All Fields]) AND ("brazil"[MeSH Terms] OR "brazil"[All  
Fields] OR "brazil s"[All Fields] OR "brazils"[All Fields])) OR ("displasia"[All Fields] OR  
"displasias"[All Fields]) AND "quadril"[All Fields])) AND ("brazil"[MeSH Terms] OR  
"brazil"[All Fields] OR "brazil s"[All Fields] OR "brazils"[All Fields])*

*(((((("displasia"[All Fields] OR "displasias"[All Fields]) AND "desenvolvimento"[All Fields]  
AND "Brasil"[All Fields]) OR "DDQ"[All Fields]) AND "Brasil"[All Fields]) OR  
(("displasia"[All Fields] OR "displasias"[All Fields]) AND "quadril"[All Fields])) AND  
"Brasil"[All Fields]*

*"luxacao"[All Fields] AND "congenita"[All Fields] AND "quadril"[All Fields]*

*"Luxacao"[All Fields] AND "congenita"[All Fields] AND "quadril"[All Fields] AND  
"Brasil"[All Fields]*

*"Displasia do desenvolvimento do quadril"[All Fields]*

*"Displasia do desenvolvimento do quadril"[All Fields] AND "Brasil"[All Fields]*