# Measurement properties of clinical assessment methods evaluating scapular positioning and function. A systematic review

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## AIM

Evidence suggest that scapular positioning and function are altered in patients with musculoskeletal shoulder disorders, e.g. in patients with gleno-humeral osteoarthritis. These alterations are anticipated to be important during rehabilitation, but there is uncertainty about which clinical assessment methods to use?

The aims were to compile a schematic overview of the available clinical scapular assessment methods and critically appraise the methodological quality of the involved studies

## CONCLUSION

- We found a substantially larger number of clinical assessment methods for scapular position and function than previously reported.
- The methodological quality of the included measurement properties in the reliability and validity domains were ‘fair’ to ‘poor’. None were examined for both reliability, validity and responsiveness.
- Simple observational methods and inclinometer assessment of scapular upward rotation could be deemed appropriate clinical methods at this stage.

## RESULTS

From 50 articles (**Figure 1**), 54 method names were identified and categorised into three groups (**Figure 2**):

- *Static positioning assessment (n=19)*
- *Semi-dynamic (n=13)*
- *Dynamic functional assessment (n=22)*

Fifteen studies were excluded for evaluation due to no/few clinimetric results, leaving 35 studies for evaluation.

Graded according to the **CO**nsensus-based **S**tandards for the selection of health **M**easurement **IN**struments (**COSMIN** checklist), the methodological quality in the reliability and validity domains was ‘**fair**’ (57%) to ‘**poo**r’ (43%), with only one study rated as ‘**good**’.

The reliability domain was most often investigated.

**Few** of the assessment methods in the included studies that had ‘**fair**’ or ‘**good**’ measurement properties demonstrated **acceptable results** for both reliability and validity.


**Figure 2**: Examples of the three clinical assessment categories.
**A**: Static positioning assessment (distance from inferior angle to nearest spinous process), **B**: Semidynamic positioning assessment (upward rotation with the use of inclinometers). **C**: Dynamic functional assessment (visual observation of scapular movement).

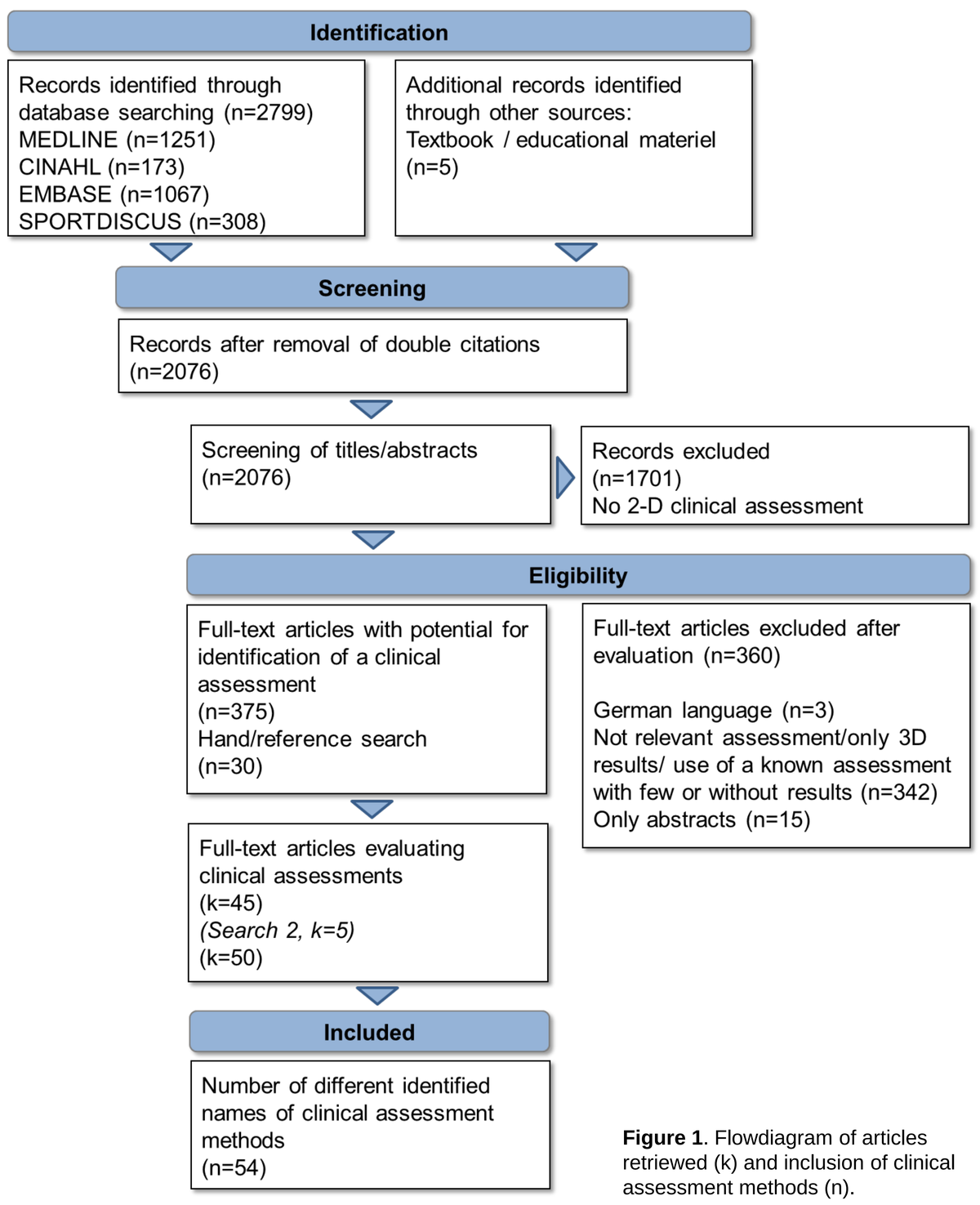


**Figure 1**. Flowdiagram of articles retriewed (k) and inclusion of clinical assessment methods (n).

## METHODS

A systematic, computer-assisted literature search was performed in four databases from inception to October 2013. Including search in reference lists of articles and methodology literature.

The overall method used can be divided into four steps:

1) Compile an exhaustive list of scapular assessment methods.
2) Additionally search for studies including clinimetric outcome measures of the identified methods.
3) Critically appraise the methodological quality of the measurement properties in each study.
4) Identify the assessment methods with acceptable results in the domains of validity and reliability as well as responsiveness, from studies which best meet the standards for acceptable methodological quality.

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