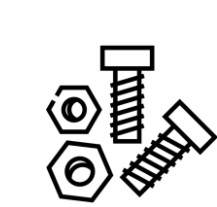


Background



The concept of integrating ‘bolt-on’ items into the EQ-5D framework has been a topic of discussion since the instrument’s inception. Despite numerous attempts to develop and test various bolt-ons, there remains significant ambiguity regarding their development, evaluation, and appropriate contexts for use.



Proponents argue that bolt-ons can **capture critical health information that the EQ-5D may overlook**, thereby enhancing its sensitivity to changes in health status resulting from healthcare interventions.



Conversely, critics contend that incorporating bolt-ons **undermines the EQ-5D’s core purpose and complicates the comparability** of health state valuations across clinical settings.



This ongoing debate highlights the **need for a structured approach to understand the conceptual underpinnings** of bolt-ons and to establish consensus on their role within the EQ-5D framework.

Methods

This project is designed to inform the development of a comprehensive conceptual foundation for future bolt-on research and use.

A **systematic review** formed the basis of an online, **publicly available bibliographic database** of citations discussing bolt-ons. Our objective was to include all articles that explicitly discuss ‘bolt-ons’. A literature search was conducted of the PubMed database and relevant grey literature was added from the EuroQol website.

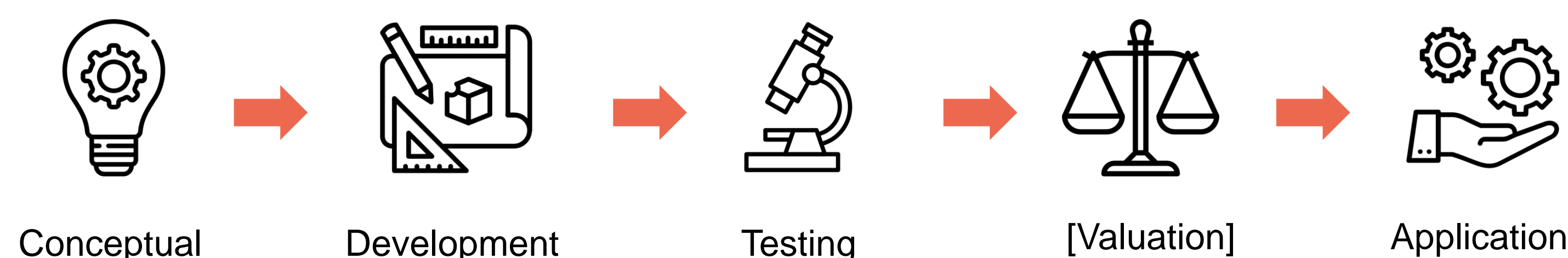
Citations were categorised and tagged according to a **taxonomy** designed by the research team. The literature review catalogued key questions related to bolt-ons, focusing on descriptive systems, valuation methods, and usage scenarios.

The review is designed to inform a survey and workshop (in development).

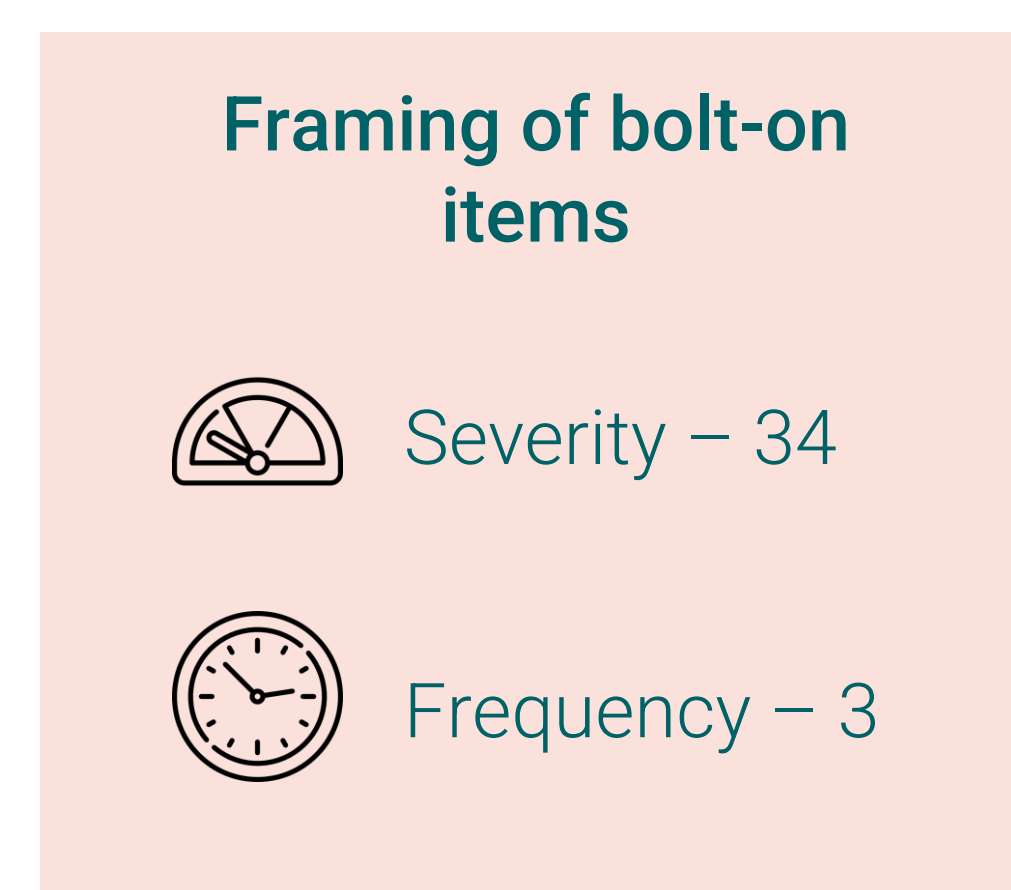


Results – 1

Forty-six articles were identified in PubMed, with additional citations added from the grey literature, resulting in 60 research items. Citations were firstly categorised according to the aspect(s) of bolt-on research that they addressed: i) conceptual, ii) development, iii) testing, iv) valuation, and v) application. We tagged citations according to the domains of interest, population/clinical context, EQ-5D instrument, framing of bolt-on (e.g. frequency v severity), methods used, country, and funder.



The most frequently researched aspects were testing, development and conceptual, with 29, 19 and 10 studies, respectively. Some studies addressed multiple aspects of bolt-on research, the most common combination was development and testing (6) as shown in the Venn diagram below. Of the studies identified, four reviews were found (two of which were conceptual) and two protocols were found. Of the 10 conceptual studies identified, 4 were funded by the EuroQol Group, 2 were funded by public institutions, 1 was funded by a private institution and 3 did not specify a funder.



Top 4 researched bolt-on dimensions

-  Vision – 15
-  Cognition – 9
-  Hearing – 8
-  Sleep – 8

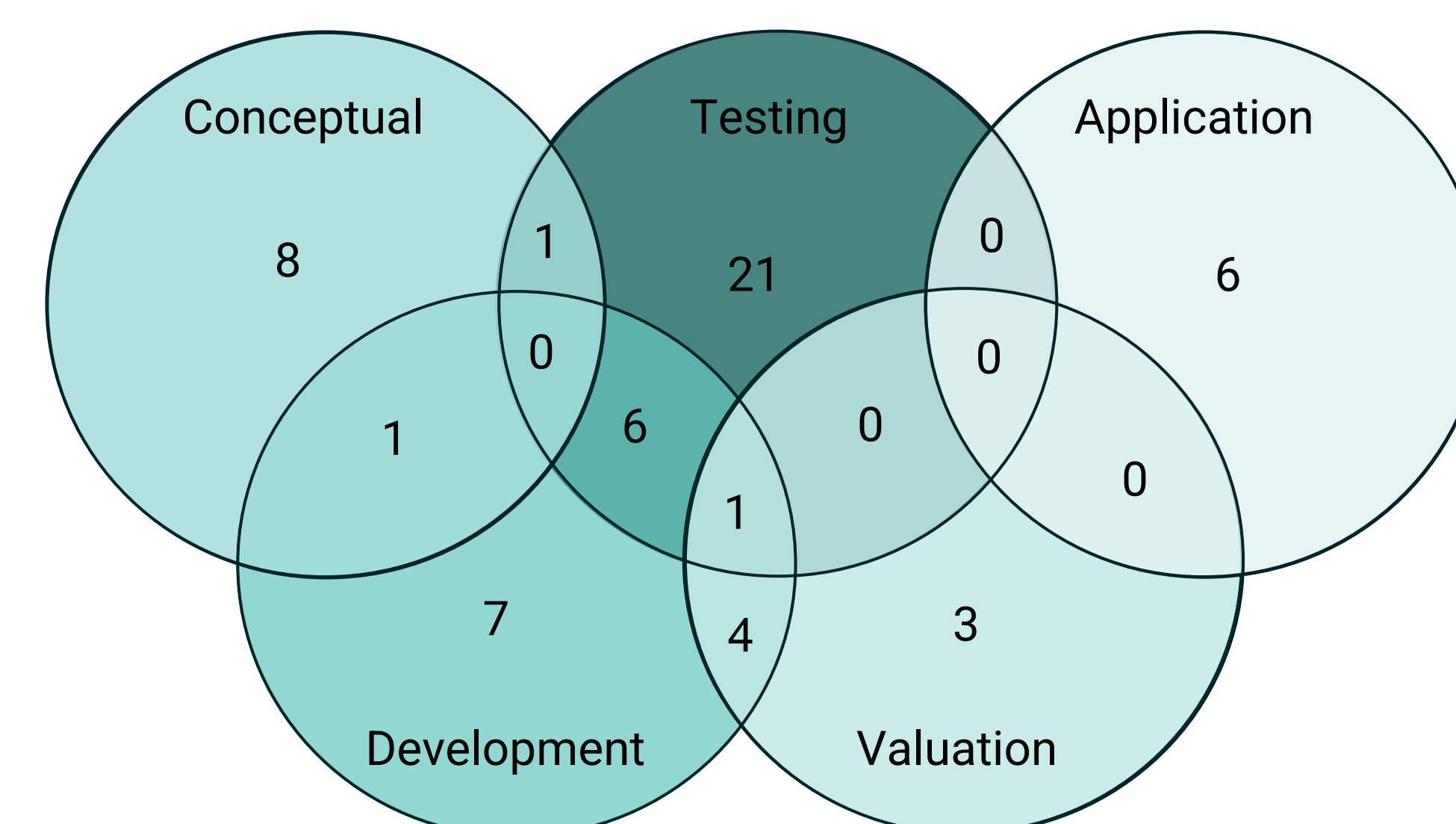


Figure 1: Venn Diagram of the aspects of bolt-on research

Results – 2

The key areas for clarification in future stages and wider research identified by the authors and informed by the literature review are as follows:

Nomenclature

- Including the most important considerations when specifying terminology for bolt-ons to ensure consistency and clarity

Definition

- How is a bolt-on defined (accounting for current usage and perceptions) and what should it capture (e.g., conditions, symptoms, functioning)

Areas for future research

- What topics should be prioritised for future research (e.g., development of new bolt-ons, validation of bolt-ons, assessing the value and practical implementation of bolt-ons or creation of guidelines)

Future purpose and role

- How should bolt-ons be used in practice, under what circumstances is the use of a bolt-on justified and the importance of value sets that incorporate bolt-ons

These areas were identified from key conceptual papers^{1,2,3} which call for more guidance on bolt-on development in combination with a lack of consistency in approaches used in other papers reviewed. These topics will form the basis of the survey and workshop.

Conclusions

- Bolt-ons continue to garner interest and criticism. There are significant gaps in our understanding of bolt-ons and inconsistencies in approaches to their use.
- Given our focus on bolt-ons and theory around bolt-ons, a limitation of this study is that research involving the extension of the EQ-5D not described a “bolt-on” is not considered.
- Future research should address the key questions raised in this study to ensure that the development and use of bolt-ons is appropriate and avoids risks that have been discussed in the literature.

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