Quantification of Insulin Adherence in Adults with Insulin-treated Type 2 Diabetes: A Protocol for a Systematic Review

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Abstract

A systematic review will be conducted to update the evidence base and provide an overview of insulin adherence quantification in adults with insulin-treated type 2 diabetes, i.e., the methods used to assess insulin adherence and the cut-off points that constitute adequate insulin adherence.

Keywords

Type 2 Diabetes, Insulin Adherence, Quantification, Systematic Review

1 INTRODUCTION

The progressive nature of type 2 diabetes (T2D) necessitates insulin therapy for most people to achieve glycaemic control [1]. Although the full benefit of insulin therapy will be accomplished only if the person with T2D complies with the prescribed insulin regimen reasonably closely [2], nonadherence to insulin therapy is common in adults with T2D [3].

While nonadherence is recognized as a key contributor to poor outcomes, many clinicians feel unable to address nonadherence [2]. A study by MacEwan et al. demonstrated that assessment of adherence rates is generally not better than a random guess (53 vs. 50%) [4].

Precise measure or assessment of insulin adherence is acknowledged as an important prerequisite to improving insulin nonadherence [3] and interpreting the effects of an intervention [5]. Results and clinical outcomes from an intervention cannot be interpreted realistically without information regarding correct adherence, i.e., if therapy fails to achieve the desired outcome, there is a risk that the clinician or researcher assume that a drug failure has occurred if adherence is assessed incorrectly and nonadherence, therefore, is not discovered [5]. Yet, there is no gold-standard method to assess insulin adherence and no cut-off point or consensual standard for what constitutes adequate insulin adherence [2].

In recent years, advances in technology have brought improvements in the field of diabetes. The spectrum of new technologies spans smartphone apps, smart pens, and insulin pumps [6]. Access to these new technologies may have had an impact on how insulin adherence is assessed. Despite this, no systematic review within the area has been published since 2016 [7].

This systematic review aims to update the evidence base by including literature published from 2012 to the time of the review and provide an overview of the methods used to assess insulin adherence and the cut-off points that constitute adequate insulin adherence in adults with insulin-treated T2D.

2 METHODS

A systematic review will be conducted and reported according to the PRISMA 2020 checklist [8]. The systematic review protocol was submitted for registration with PROSPERO on May 20, 2022 and has not yet received a registration number. The protocol will form the basis of the review. The review process is illustrated in Figure 1.
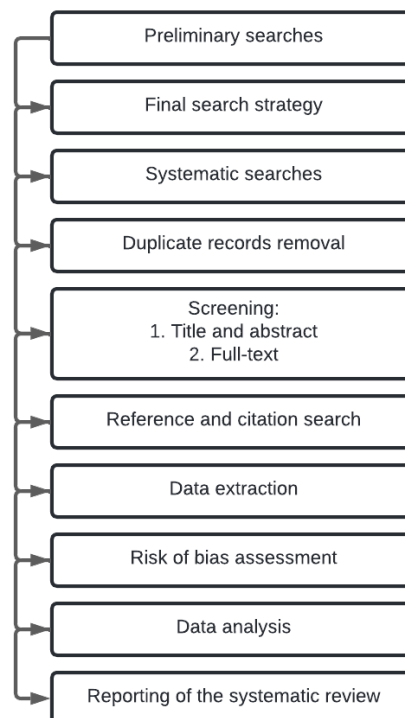

Figure 1. The review process.

To qualify the systematic search preliminary searches will be performed to obtain an overview of published literature and to identify relevant index terms, search terms, and keywords. A systematic search will be performed in PubMed, Embase, Cinahl, and PsycINFO. The search will include three blocks: type 2 diabetes, insulin, and adherence. Synonyms, near-synonyms, acronyms, index terms, and spellings for each keyword will be identified. Different search functions such as Boolean operators, truncation, thesaurus, phrase searching, and text word (title, abstract, keyword) will be applied to focus and structure the search. Studies published from 2012 to the time of the review and describe a method to assess insulin adherence and include details on the cut-off point will be considered. Primary full-text studies in English, Danish, Norwegian, or Swedish will be screened for inclusion, except for study protocols and animal research. Reference lists will be hand-searched and citation searching will be conducted to identify additional relevant studies within the field.

Data extraction will include details of the methods and cut-off points used to assess insulin adherence, insulin regimen, the population, and study design. The risk of bias will be assessed for each of the included studies using critical appraisal tools from the Joanna Briggs Institute (JBI) [9]. The results of the systematic search, screening, and risk of bias assessment will be reported in full in the systematic review. By the PRISMA guidelines, the screening process will be presented in a PRISMA 2020 flow diagram [8]. A narrative synthesis will be provided with the information presented in text and tables. The identified methods to assess insulin adherence will guide the organization and description of the results. Cut-off points from each study will be listed.

The systematic search will be performed by one reviewer and facilitated by a research librarian with expertise and experience in medical science and diabetes. Title and abstract screening will be done by one reviewer, while two independent reviewers will screen full-text articles. Data extraction and analysis will be performed by one reviewer. In the event of questions or doubts, the review co-authors will be consulted, and an agreement will be reached by discussion.

3 RESULTS

The results will update the evidence base by providing an overview of the reported methods to assess insulin adherence and the cut-off points used to define adequate adherence. Potential novel methods or technologies to assess insulin adherence will be included and the results will provide insight into potential gaps within the field. The results are expected to be published by the end of 2022.

4 DISCUSSION AND CONCLUSIONS

This systematic review will clarify methods used to assess insulin adherence and the cut-off points that constitute adequate insulin adherence in adults with T2D. Potentially, the results can be used to guide clinicians and researchers when selecting a method to assess insulin adherence in adults with T2D. The systematic review may also inform of new methods or technologies used to assess insulin adherence if such has been implemented. Hence, the results could potentially pioneer the implementation of future

technologies or methods for the assessment of insulin adherence in adults with T2D.

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