

SYSTEMATIC REVIEW

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A **systematic review** is an overview of primary studies which helps to limit bias through the systematic identification, appraisal and synthesis of results using predetermined, explicit and replicable methods thereby reducing all aspects of bias. "Hence, rather than reflecting the views of 'experts', they generate balanced inferences based on collation and analysis of the available evidence" (Khan, 2001). Systematic literature reviews are invaluable scientific activities and the rationale for their use is well established. Health care providers, researchers and policy makers are inundated with unmanageable amounts of information and need systematic reviews to efficiently integrate existing information and provide data for rational decision making. Figure 1 outlines the process involved in conducting a systematic review.

HSOR'S involvement with JBI as an international collaborating centre

The Joanna Briggs Institute is a global leader in evidence-based medicine with international collaborators across 40 countries in every continent. JBI offers resources designed to meet the needs of service providers, health professionals and consumers by connecting the best available international evidence to the point of care. HSOR became a JBI Collaborating Centre in November 2008 and contributes towards evidence synthesis and to the international collaborative efforts of the institute. HSOR currently has 3 systematic reviews registered with JBI, one of which one was recently completed. An outline of this review is given below.

Recently completed systematic review on the economic evidence of self-monitoring of blood glucose in type 2 diabetes mellitus

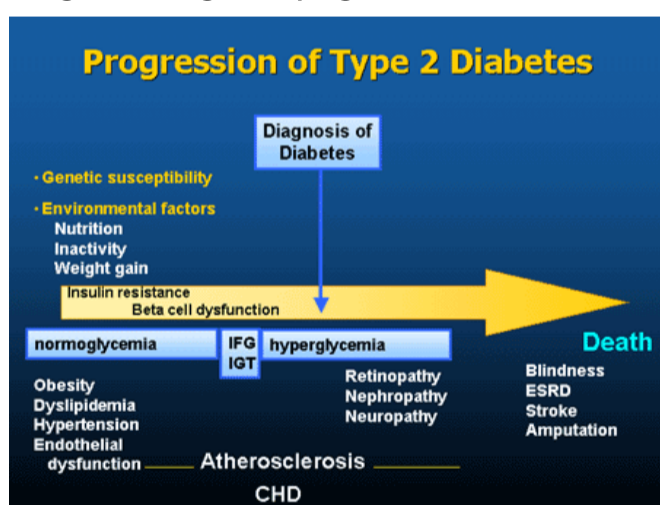
Our recent SR was "Self-monitoring of blood glucose in type 2 diabetes mellitus: Systematic review of economic evidence". We undertook this review to determine the aggregate evidence surrounding the cost-effectiveness of self-monitoring of blood glucose (SMBG) in patients suffering from type 2 diabetes.

Good control of blood glucose is crucial to the prevention and delay of diabetes-related illnesses (See Figure 2 for the progression of diabetes over time). SMBG is an intervention which helps improve glycaemic control by collecting detailed information pertaining to blood glucose levels, at many time points, to aid adjustment of therapeutic regime and to help individuals adjust their dietary intake, physical activity and insulin doses. See Figure 3, a typical glucose meter.

SMBG can aid in diabetes control by:

- aiding the development of a personalised blood glucose profile which can guide health care professionals in personalising a diabetic treatment planning regime.
- giving diabetic patients and their families the ability to make appropriate day to day treatment choices in relation to diet and exercise, as well as in insulin or other agents.
- improving patients' ability to recognise hypoglycaemia or severe hyperglycaemia.
- enhancing patient education and patient empowerment regarding the effects of lifestyle and pharmaceutical intervention on glycaemic control.

Figure 2: Long-term progression of diabetes



We conducted an extensive and exhaustive search of the literature and identified five studies to be included in our review. Three of the studies were model-based analyses assessing the long-term cost-effectiveness of SMBG (8-40 year analyses) and all of them concluded that SMBG was cost-effective in their various settings. Two further analyses were conducted as primary economic evaluations and assessed short-term cost-effectiveness (1 year). Conversely, their results found SMBG to be more costly with no associated improvement in blood glucose.

The economic evidence surrounding SMBG in type 2 diabetes remains unclear. For the most part, included studies found SMBG to be cost-effective though the long-term analyses were extremely sensitive to data inputs, the time-frame considered and model assumptions. Conversely, results of the primary economic analyses showed unfavourable cost-effectiveness results. Data were reported by subgroups and it is likely that SMBG in drug and insulin treated patients may be cost-effective. The current evidence-base, with its lack of consensus and small number of well-conducted studies, should be viewed as hypothesis generating rather than providing conclusive evidence of the cost-effectiveness of SMBG.

Implications for research and practice

Further primary economic evaluations (preferably conducted alongside randomised controlled trials) are recom-

Figure 1: Flow chart of the systematic review process

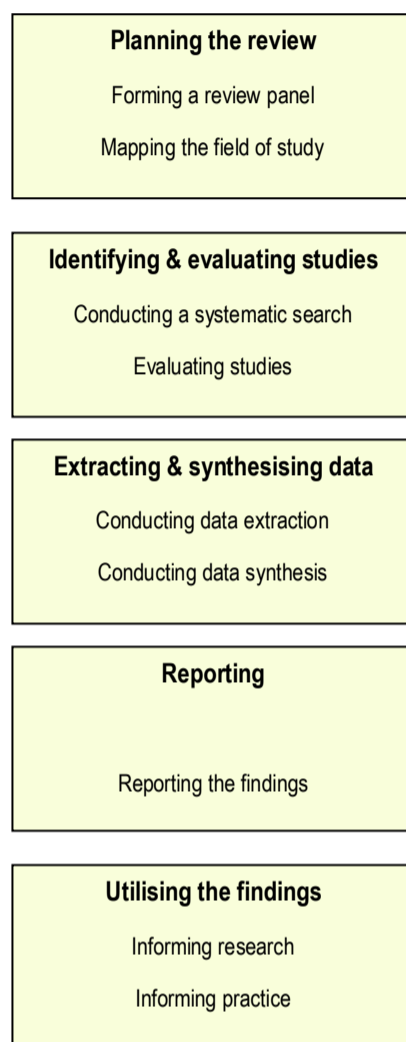


Figure 3: SMBG glucometer device



mended to be undertaken so as to be able to quantify the potential added benefit, in terms of costs and effects, for insulin and drug treated patients.

Given the current evidence base, it is reasonable to suggest that the evidence does offer some support in relation to drug and insulin treated type 2 diabetes patients and this review, therefore, concludes that clinicians should select appropriate patients for SMBG from these groups based on their domain expertise. With regards to diet and exercise treated diabetes patients, there is little strong evidence to recommend the regular use of SMBG in current practice. Therefore, clinician discretion in relation to SMBG use in this group is advised.

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Robyn, Research Analyst, focuses on systematic reviews and the contextualisation of economic evidence from systematic reviews and health technology assessments to the Singaporean setting. Prior to her appointment at NHG, Robyn trained as a health economist at the University of Aberdeen in the UK, specializing in the development and application of economic evaluation methods to trials and systematic reviews.