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Incidence and prevalence rates of diabetes mellitus in Saudi Arabia: An overview

Abdulellah Alotaibi [a,b,*], Lin Perry [b,c], Leila Gholizadeh [b], Ali Al-Ganmi [b,d]

[a] Faculty of Applied Medical Science, Shaqra University, Saudi Arabia
[b] Faculty of Health, University of Technology Sydney (UTS), Australia
[c] South Eastern Sydney Local Health District, Australia
[d] Faculty of Health, University of Baghdad, Iraq

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ABSTRACT

Objective: This study aimed to report on the trends in incidence and prevalence rates of diabetes mellitus in Saudi Arabia over the last 25 years (1990–2015).
Design: A descriptive review.
Methods: A systematic search was conducted for English-language, peer reviewed publications of any research design via Medline, EBSCO, PubMed and Scopus from 1990 to 2015. Of 106 articles retrieved, after removal of duplicates and quality appraisal, 8 studies were included in the review and synthesised based on study characteristics, design and findings.
Findings: Studies originated from Saudi Arabia and applied a variety of research designs and tools to diagnosis diabetes. Of the 8 included studies; three reported type 1 diabetes and five on type 2 diabetes. Overall, findings indicated that the incidence and prevalence rate of diabetes is rising particularly among females, older children/adolescent and in urban areas.
Conclusion: Further development are required to assess the health intervention, polices, guidelines, self-management programs in Saudi Arabia.

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* Corresponding author at: Faculty of Health, University of Technology Sydney (UTS), Australia.
E-mail addresses: Abdulellah.M.Alotaibi@student.uts.edu.au, abaadi1982@hotmail.com (A. Alotaibi), Lin.Perry@uts.edu.au (L. Perry), Leila.Gholizadeh@uts.edu.au (L. Gholizadeh), ali.h.al-ganmi@student.uts.edu.au (A. Al-Ganmi).

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1. Introduction

Diabetes Mellitus (DM) is a growing global health concern. In 2000, diabetes affected an estimated 171 million people worldwide; by 2011 this had increased to more than 366 million and numbers are expected to exceed 552 million by 2030 [1]. DM is a metabolic disease of multiple aetiologies, characterised by hyperglycaemia resulting from defects in insulin secretion, insulin action or both, and associated with disturbance of carbohydrate, fat and protein metabolism [2]. The three commonest types of diabetes are Type 1 Diabetes Mellitus (T1DM), Type 2 Diabetes Mellitus (T2DM) and Gestational Diabetes Mellitus (GDM) [3].

The highest prevalence of diabetes overall is anticipated to occur in the Middle East and North Africa due to rapid economic development, urbanisation and changes in lifestyle patterns in the region [1]. The Kingdom of Saudi Arabia (KSA) is not excluded from this global epidemic [4] and diabetes is the most challenging health problem facing this country [5]. According to a report by the Saudi Arabian Ministry of Health, approximately 0.9 million people were diagnosed with diabetes in 1992, but this figure rose to 2.5 million people in 2010, representing a 2.7 times increase in the incidence rates in less than two decades. In 2015, 4660 patients with diabetes attended the family and medical clinics across Saudi Arabia [6]. This increasing burden of diabetes is due to various factors, including a rising obesity rate and an aging population [7].

Patients with diabetes commonly experience other associated chronic conditions, resulting in serious complications [3]. For example, the incidence of end stage renal disease is higher among patients with diabetes [8] and accounts for between 24% and 51% of those receiving renal replacement therapy [9]. Compared to the general population, patients with diabetes are two to four times more likely to develop cardiovascular disease, and two to five times more likely to die from this disease [10]. In addition to its impact on individuals, diabetes places a significant burden on healthcare services and the community as a whole [11]. Globally, diabetes accounted for 11% of the total healthcare expenditure in 2011; in Saudi Arabia, the annual cost of diabetes has been estimated at more than $0.87 billion [12].

It is essential to understand the epidemiology of diabetes in order to identify public health priorities, to generate policy initiatives and evaluate the effect of services in reducing the individual and social burden of diabetes [13]. Although prevalence estimates by countries and regions are provided by the International Diabetes Federation, there are substantial variations in time trends as these estimates are based on imputation [14]. To date, no systematic review has been reported on the incidence and prevalence of diabetes in Saudi Arabia. Considering the major socio-economic changes that have occurred in this country during the past few decades, and their marked impact on the lifestyles, eating habits and physical activities of the people of this region, along with the aging of the population, this is an important omission [12]. This review has therefore been conducted to report the trends in incidence and prevalence rates of diabetes mellitus in Saudi Arabia between 1990 and 2015.

2. Methods

2.1. Review design

This review employed a descriptive design to review and analyse studies reporting the incidence and prevalence rates of diabetes in Saudi Arabia. This approach is also referred to as correlational or observational design and is commonly used to obtain information about naturally occurring health states [15]. This descriptive study followed the Joanna Briggs Institute (JBI) (2014) protocol for the review of prevalence and incidence studies, including search strategy, quality appraisal, data extraction and synthesis, results, discussion and conclusion.

2.2. Search strategy

A systematic literature search was performed to identify publications reporting the incidence and prevalence rates of diabetes in Saudi Arabia. Included publications focused specifically on studies describing the incidence and prevalence rates in relation to either a diagnosis of diabetes, or explicit blood glucose-level criteria for diagnosis of diabetes. Studies considering type 1 or type 2 diabetes, or both, were included as these account for over 90% of all diabetes [16]. Medical Subject Heading terms (MeSH) were used, including prevalence, incidence, diabetes mellitus, and Saudi Arabia. Synonyms for the identified concepts were generated including, "epidemiology" and "trend"; "type 1 diabetes" and "type 2 diabetes". These concepts were combined using Boolean Operators (AND, OR). Four academic databases (Medline, EBSCO, PubMed and Scopus) were searched for relevant literature. The search was limited to English language papers published between 1990 and 2015. Papers published in languages other than English, and publication types other than primary studies (such as systematic reviews and meta-analyses, discussion papers, conference abstracts and dissertations) were excluded. In total, 106 citations of potential relevance were identified (Table 1). Initial screening of titles and abstracts revealed that 90% of these retrieved studies did not meet the review inclusion criteria, with 16 papers retained for full-text evaluation. Full text screening for relevance resulted in the exclusion of five further papers. Two articles were added from the reference lists of the reviewed articles and Google scholar.

2.3. Quality appraisal

These 13 articles were critically appraised for quality using the JBI Critical Appraisal Checklist for studies reporting prevalence data [15]. All papers were evaluated on the basis of data relevance and methodological rigor, and papers that met a minimum of five of the nine criteria (see column headings, Tables 2 and 3) were included. The process resulted in the exclusion of four papers (Table 2; Fig. 1). The remaining nine studies employed appropriate quantitative designs for incidence and prevalence studies (Table 3).

Table 1
Search terms, database and search output.

Search No	Search Terms	Medline results	EBSCO results	PubMed results	Scopus results	Total
S 1	Prevalence or epidemiology or trend	579,280	1,061,711	2,656,747	2,749,216	7,046,954
S 2	Incidence	229851	249,619	2355894	1,014,650	3,850,014
S 3	Diabetes mellitus	495873	258,094	564756	699,008	2,017,731
S 4	Saudi Arabia	9627	59,039	44900	34,024	147,590
S 5	S1and S2 and S3 and S4 with limits: date (1990–2015), Peer Reviewed, Human, Journal Article and English Language)	12	15	61	18	106