

The Prevalence of Diabetes Mellitus in Taif Region, Saudi Arabia during 2013- 2014

Sitalnesa Abdelhafeez¹, Hameed Al-Swat², Sawsan Babiker^{3,4}, Omailma Nasir⁴, B A.Eisa⁵

¹ King Abdul-Aziz Specialist Hospital, Academic Affair and Training department, Taif, Saudi Arabia

² King Abdul-Aziz Specialist Hospital, Diabetes Center, Taif, Saudi Arabia

³ Departments of Mathematics, Faculty of Sciences, Gezira University, Sudan

⁴ Department of Biology, Turabah University College, Taif University, Saudi Arabia

⁵ King Abdul-Aziz Specialist Hospital, Statistics department, Taif, Saudi Arabia

Abstract: A descriptive cross-sectional study using administrative health data to identify the prevalence of diabetes conducted in Taif Region Saudi Arabia. Twenty thousand and six hundred patients were included in the study. Data was collected during the year 2013 to 2014 from 4 public hospitals, 88 primary health centers. A questionnaire consist of demographics, Type of DM and treatment options was used. Prevalence of DM, Frequencies, the mean and standard deviation were calculated for analysis. All data was sent to the Diabetes Unit at King Abdulaziz Specialist Hospital where the analysis was done using excel and SPSS software. The results showed a total of 20600 patients registered. Mean age 56.57 ± 16.58 . Males (50.6%) were slightly higher than females. DM type 2 constitute (17032, 82.6%), the treatment they had (52.8 %) of them received tablet. The most affected age group was 45 -60 years (40.5%). Patients with DM above 45 years constitute 80%. Regarding Age-specific prevalence rate, patients above 45 years old the prevalence ranged from 25% in Almweih as a higher to 8% in Taif, Asheera and Alhawia at a lower rate. The Prevalence rate increased with increasing age reaches 30% in patients of 60 years old or older in Alhada group.

Keywords: Prevalence, Diabetes Mellitus, Taif region, Saudi Arabia

1. Introduction

Diabetes Mellitus (DM) is a chronic condition that influences the body's capacity to utilize the energy found in food. Three main types of diabetes: type 1 diabetes, type 2 diabetes, and gestational diabetes^[1].

Type 2 DM (T2DM) is the most widely recognized sort of DM, representing around 90% of all DM cases^[2-4].

All types of diabetes can lead to complications in different parts of the body and can increase the risk of premature death. These complications include and are not limited to heart injury, renal failure, blindness, and leg amputation,

In pregnant women, diabetes of poor control can increase the risk of fetal death^[5].

Diabetes mellitus is among the most predominant and grim chronic illness, influencing the soundness of a huge number of people worldwide comprehensively, an expected 422 million grown-ups are living with diabetes mellitus, as indicated by the data of 2016 from the World Health Organization (WHO)^[6].

The International Diabetes Federation (IDF) issued an estimate of the number of people with diabetes in 2003 of 194 million and a projection of 194 million in 2025^[4]. The latest statistics from IDF consider diabetes as a primary hazard to global development^[7].

Regarding types of diabetes, the most common type is Type 2 diabetes mellitus, while type 1 diabetes mellitus considered

a significant public issue. The incidence of T1DM is likewise on the upward thrust in both developing and Developed countries, as 70,000 young new cases identified every year^[7-8].

In Saudi Arabia, according to report by the Saudi Arabia Ministry of Health the DM is the most challenging health problem facing the country and the number of patients was 0.9 million in 1992 and increased to 2.5 million in 2010^[9].

The National Saudi Diabetes Registry was established by King Saud University Hospital Diabetes Center in a joint effort with King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia, in the year 2001. Registration is done online from participating hospitals to the national registry^[10].

King Abdulaziz Specialist Hospital in Taif was among the hospitals participating in the National Registry in 2010. Many diabetic patients are monitored in primary health-care centers, and cases are transferred only to the hospital if needed. This study included diabetic patients attending health centers as well as hospitals to give a picture of the extent of diabetes spread in different regions of Al-Taif governorate in Saudi Arabia. The increasing burden of DM could be attributed to the rising level of different modified risk factors: overweight and obesity driven by the change in lifestyle^[11-14]. Knowing the prevalence rate and the number of individuals with diabetes guide resource allocation and planning for prevention. Therefore, this study aims to describe the prevalence, sociodemographic, geographical distribution and types of diabetes in Taif region.

2. Methodology

2.1 Study design

Using an administrative data of all known diagnosed diabetic patients which was collected from June 2013 to June 2014 from public health institutes in TaifRegions (6 provinces) including 4 hospitals (King Abdulaziz Specialist Hospital, King Faisal Hospital, Pediatrics hospital and Chest Hospital) and 88 Health centers (Supervised by 19 Health center groups). A questionnaire consisted of demographics, type and treatment options were distributed to health institutions to register patients. All data (manually or computerized) from hospitals and health centers sent to Diabetes unit at King AbdulazizSpecialist hospital (fig 1). The dataentered to the computer, merged, sorted and analyzed using Excel and SPSS software. A total of 20600 patients were registered.

2.2 Setting

Taif Region divided into 6 provinces (Taif, Turabah, Rania, Alkhurma, Almoyai, and Misan), with A population density of 987914 (2010 census)^[15]

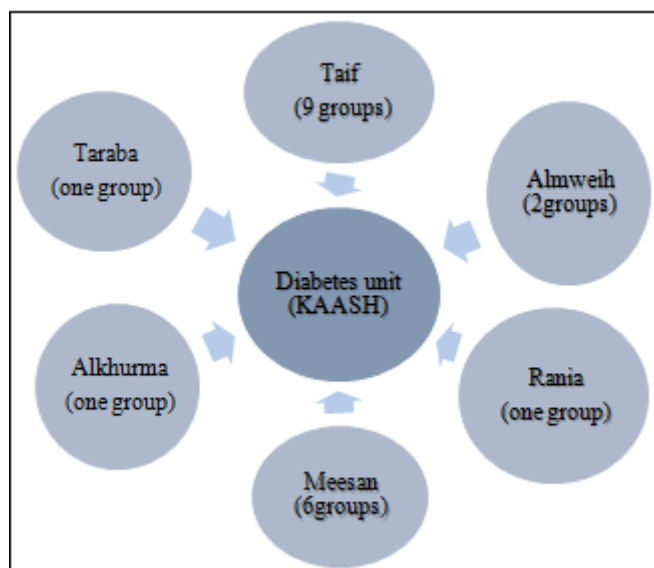


Figure 1: Taifprovinces, Taif, Saudi Arabia

2.3 Sample & Data Set

A total of 20600 patients wasregistered.

2.4 Data analysis

The analysis was done using Statistical Package for Social Sciences SPSS (Version 21.0). Analysis for all patients has been done regarding socio- demographic characteristics including gender, nationality, age groups, type DM and treatment options.

The estimate of age-specific prevalence rate is calculated for nine Supervisory health groups (out of 19) in which the data of age was completed. The denominator is considered as the total number of patients registered at nine Supervisory groups.

3. Results

A total of 20600 patients were registered after the removal of duplications (using their names and ID number). Table [1] shows the general characteristics of Diabetic patients with their demographic characteristics. More than half of them were males (50.6%). The majority of them were Saudi (93.3 %).

Regarding age and geographical characteristics, we exclude 4014

Patients whose age or location missed, so 16586 included.

Mean age was 56.6 and the most affected age group was 45 - 60 years (40.5%). Patients with DM above 45 years constitute 80% Table 1.

Regarding type of diabetes,type 2 is most frequent (17032, 82.7%) Fig 2. The treatment they had (52.8 %) of patientsreceived tablet Fig 3.

Table 1: General characteristics of diabetic patients, Taif, Saudi Arabia

Variable	Frequency (%)
Age (mean)	Mean 56.6
Age in groups	
Less than 15years	288 (1.7)
15 – 44 years	3017 (18.2)
45 – 60 years	6725 (40.5)
More than 60 years	6556(39.5)
Sex	
Male	10414 (50.6)
Female	10186 (49.4)
Nationality	
Saudi	19222 (93.3)
Non-Saudi	1378 (6.7)

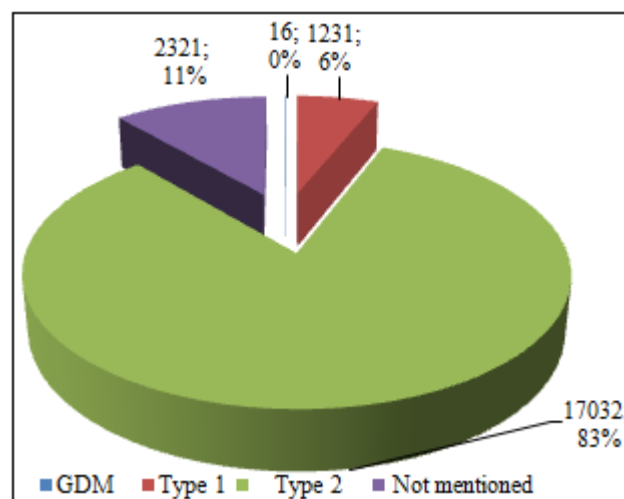


Figure 2: Type of diabetes, Taif, Saudi Arabia

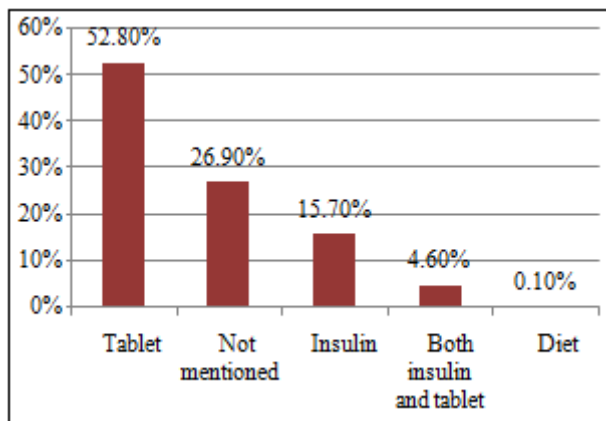


Figure 3: Treatment options in diabetic patients, Taif, Saudi Arabia

Most of patients received Tablet (52.8%).

Regarding the type of health Institutions sending their data, the majority were from primary health centers (9 Supervisory health Center groups) which constitute 16158 (78.4%) and 4 hospitals 4435 (21.6%) Table 2.

Table 2: Type of DM by different health institutions, Taif, Saudi Arabia

Health institution	Frequency	Percent
Supervisory groups (19 groups)	16158	78.4%
King Abdulaziz Specialist Hospital	3863	18.8%
King Faisal Complex	363	1.8%
Pediatrics Hospital	198	1.0%
Chest Hospital	11	.1%
Missing	7	.0
Total	20600	100.0

The Prevalence rate of DM was calculated by including only Nine Supervisory health groups with a complete registry of age. The denominator was considered as the total number of Patients registered in health center groups. Hospitals were Excluded. 8804 (42.7%) out of 20600 patients were included in the calculation of age-specific prevalence rate with Complete age and location.

Table (3) shows the prevalence rate for all patients above 45 years old in nine Supervisory health groups which ranged from 25% in Almweih as higher to 8% in Taif, Asheera and Alhawia as a lower rate.

Table 3: Prevalence rate of DM for patients above 45 years by Supervisory Health center groups

No	Supervisory health center group	Total patient registered above 45years old*	DM above 45years old	Prevalence of DM above 45years old
1	Almweih	1966	498	25%
2	Hidad	1205	248	21%
3	Alguraea	1455	287	20%
4	Alhada	2328	426	18%
5	Kilakh	2040	334	16%
6	Alkhurma	4874	586	12%
7	Alhawia	13801	1157	8%
8	Asheera	5274	441	8%
9	Taif City	53416	4204	8%

* Source of data: General Directorate of Health Affairs, Information Technology department – Taif, Saudi Arabia

Table (5) shows the age-specific prevalence rate by Supervisory Health groups. The Prevalence rate increased with increasing age Which reached 30% in patients of more than 60 years old in Alhada group.

Table 4: Shows the Age-specific Prevalence rate (%) of diabetes by health center groups

No	Health unit group	Age-specific Prevalence rate (%)			
		more than 60 years	45-60 years	15-44 years	less than 15 years
1	Alhada	29.53	13.19	1.74	0.00
2	Hidad g	28.05	13.79	0.65	0.00
3	Alguraea	25.53	14.32	1.02	0.40
4	Asheera	22.02	8.28	0.41	0.02
5	Alshafa	19.64	4.79	0.28	0.09
6	Kilakh	19.38	13.98	0.39	0.00
7	Alkhurma	12.34	11.82	0.55	0.01
8	Alhawia	11.96	6.46	0.45	0.01
9	Taif city	10.92	6.33	0.38	0.02

4. Discussion

In the current study, the data collected was administrative data including patients who were already diagnosed with diabetes from 4 hospitals and 88 health centers in contrast to many studies which were community-based cross-sectional surveys to identify the prevalence of diabetes. The results of this study give a picture of diabetes distribution in different parts of the Taif region. The value of this data that it can be considered as basic for diabetes surveillance and to build on it a registry for continuous data collection.

This study showed the prevalence of DM which varies according to age group and location. High prevalence is shown in the age group above 45 years old and above 60 years old.

The Prevalence of DM is increasing globally and the Gulf country is no exception. Reported prevalence data from the Gulf region revealed high rates in Bahrain (25.7%) and Oman (16.1%) [16, 17]. The data obtained from a community-based study report an overall prevalence of DM of 23.7% in Saudi Arabia [18]. In our data the prevalence of diabetes mellitus in different health groups from Taif region showed that prevalence of DM is high reach up to 30% in some Taifregions, this result showed clearly, a substantially higher prevalence than what has been reported by previous studies for Saudi Arabia [19]. Globally there is no gender difference in the prevalence of DM [20, 21], in our study, there is slightly gender difference.

Worldwide, between the years 2003 and 2025 there will be an increase of 42% regarding diabetes prevalence [22]. In Saudi Arabia there are many socioeconomic, dietary and lifestyle factors linked with DM and considered as a risk factors for DM, deeper population-based studies are needed to see the role of these risk factors and their contribution towards the incidence and prevalence of DM.

Our study showed the high increase in the prevalence rate in different Taif region and it involved large population, which in most cases, include only some regions of the country, it is highly possible that similar study could be conducted in

different regions of the country to make overall picture of the prevalence of DM to make a national prevention program which can check diabetes and address the modifiable risk factors at the community level, focusing on the high-risk groups. Regarding previous researches from Saudi Arabia, Researchers recommended each Saudi individual of 30 years of age and above should be screened for Diabetes type 2 and prediabetes^[23].

5. Conclusion

This study shows information on the prevalence of diabetes mellitus and summarizes the analysis of administrative data. As diabetes surveillance is a continuous process and this could be a basis for establishing a surveillance system (diabetes registry) and help in future controlling and prevention of DM in Taif regions. This study provided important evidence regarding intervention programs needed to manage diabetes effectively and it could be the first step to establish a population-based registry, although included a limited number of variables.

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7. Declarations

Author(s) declare that all works are original and this manuscript has not been published in any other journals. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Author Contributions

Conceptualization: Sitalnesa Abdelhafeez, Hameed Al-Swat, Sawsan Babiker, Omaima Nasir,

Data curation: Sitalnesa Abdelhafeez, Hameed Al-Swat, B A. Eisa Sawsan Babiker, Omaima Nasir,

Formal analysis: Sawsan Babiker

Methodology: Sitalnesa Abdelhafeez, Sawsan Babiker

Resources: King Abd Aziz Hospital, Taif, Saudi Arabia

Writing – original draft: Sitalnesa Abdelhafeez, Sawsan Babiker, Omaima Nasir,

Writing – review & editing: Sitalnesa Abdelhafeez, Hameed Al-Swat ,Sawsan Babiker, Omaima Nasir

Appendix 1:

