

# Assessment of Dental Healthcare Services and Workforce in the Jazan Region, Saudi Arabia

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DOI: [10.36348/sjodr.2021.v06i01.017](https://doi.org/10.36348/sjodr.2021.v06i01.017)

| Received: 13.01.2021 | Accepted: 25.01.2021 | Published: 27.01.2021

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## Abstract

This study focuses on the Jazan region, Kingdom of Saudi Arabia (KSA). To date, there has not been any documented evidence about dental health care in the region. The study aimed to provide an overview of dental healthcare services in Jazan, Saudi Arabia. Mainly secondary data were used in this study. Searches were conducted on MEDLINE, One Search Website, and Google Scholar. Most recent publicly available data were included that describe the current practice. The search was conducted between June 2020 and Jan 2021 for published documents including peer-reviewed manuscripts and published government documents on public oral health system in Jazan. We also obtained unpublished documents from the regional health directorate. There were 103 (59.2%) PHCs and 21 (12.1%) hospitals which had a dental component in Jazan region. Sabya City has the higher number of PHCs compared to other cities. Some cities do not have a dental service provided by PHCs, such as Al Harth and Atwal, which have four and five PHCs respectively but do not have dental clinics. The distribution of providers and services, the low number of dental hygienists and assistants, and the type of facility (PHCs or hospitals) are some of the issues in encountering dental service in the Jazan region. Further primary research focusing on different cities or geographical areas in the Jazan region is needed to validate these findings.

**Keywords:** Dental healthcare services, oral health and oral health status, dental workforce, Jazan, Saudi Arabia.

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## INTRODUCTION

The Ministry of Health (MOH) in the Kingdom of Saudi Arabia (KSA) funds most of the health care system in the country. The Ministry was established in 1950 [1], and regulates 53% of all the medical centers in the country, as well as 62% of the country's hospitals. Other government sectors receive annual budget from the KSA government and provide approximate 9% of the total health services in KSA [2]. The healthcare system in KSA is a mix of public and private health-care delivery system and MOH is responsible for managing, planning, implementing, promoting, and evaluating the health services provided. Public healthcare services are provided at all levels [3]. Primary Healthcare Centers (PHC) provide preventative and curative services such as vaccinations, dental care, health education, and environmental health [4, 5]. Patients are referred to general hospitals and specialized clinics and hospital to receive advanced and complex treatment. Currently, the MOH 2261 primary

healthcare centers (PHC) and 286 hospitals [6]. Despite private sector health clinics and hospitals are owned and operated by individuals and/or by private companies, their duties and staff training are managed by the MOH [7].

According to the World Health Organization [8], the healthcare system in Saudi Arabia was ranked 26th in the world, ahead of most other Gulf Countries. It also ranked higher than some developed countries, such as Canada (30th), Australia (32nd), and the USA (37th)<sup>3</sup>. Even though the KSA international high ranking in healthcare, the government is keen on improving health services as demonstrated by the huge annual budgetary allocation [9]. The KSA government has given high priority to the development of healthcare services at all levels [10]. One key indicator of the government's commitment is healthcare financing. For example, in 2019, the total MOH budget represented 8.41% (approximately 93 billion S.R or ≈35 billion

Australian dollars) of the total national budget [6] which was higher than that reported about 5 years prior 8.19 % of the total budget (70 billion S.R) [6]. There is a lack of available data of the share of total healthcare expenditure on oral healthcare.

Despite these achievements, there are still enormous challenges in providing better healthcare services to the fast-growing population of the KSA [10]. This continued population growth has led to high health care costs and challenges and difficulty to maintaining health care quality throughout the country. Furthermore, there is a lack of workforce planning since KSA faces a considerable shortage in the number of local healthcare professionals, thus it relies upon foreign health care nationals to provide critical services. This results in workforce instability and a high turnover rate [2]. The quality of health service provision measured through patients surveys has shown a high regional variability of the satisfaction scores. Findings from a survey on patients' satisfaction with Saudi MoH health services in the third quarter of 2020, revealed that the patients' satisfaction score was 72.75% where regional satisfaction scores varied between 59.82 and 92.53 [11]. Compared with the other regions in the country, Jazan region scored the lowest patient satisfaction levels. The various components influencing patients' experience with Saudi's MoH health services has been explored using quantitative methods [12].

The public dental healthcare sector faces similar challenges. Oral healthcare services are offered free of charge for all citizens and residents of the KSA, yet, the majority of those entitled to benefit from the service seems to choose to receive treatment in private dental clinics [3].

Regarding oral health outcomes, it has been reported that the country has experienced a significant increase in dental caries [13-16]. Some studies found that the prevalence of dental caries had increased dramatically from 68 to 96% [17, 18]. The high prevalence of dental caries has been reported among all ages, including children, adults, and older individuals [18, 19]. In the Jazan region, dental caries prevalence is high, and similar to the studies conducted in other cities of Saudi Arabia [20, 21]. In addition to the reasons such as inadequate oral hygiene practices, high consumption of soft drinks, and high sugar consumption more generally, this high prevalence of caries might be due to not being seen by a dentist consistently [22].

By exploring dental health services provided by MOH facilities in the Jazan Region of the KSA, this study will provide relevant information on current services and provide recommendations for the future improvement of public dental healthcare services and workforce. To our knowledge, there have been no published studies describing the current dental care services provided by the MOH in the Jazan region. This

study will fill a gap in the current literature on the oral health system in Jazan, which will also provide important insights into the functioning of the oral health system in the KSA as a whole.

## MATERIALS AND METHODS

A mixed methodological approach was adopted in this study where data were obtained from primary and secondary sources, mainly in the form of document analysis. Additional information was obtained from unpublished documents of the Regional Health directorate. We conducted a non-systemic search of the literature to provide an overview of the governmental dental healthcare services in Jazan, Saudi Arabia. The review was carried out using the electronic databases of MEDLINE, One Search Website, and Google Scholar.

The key terms used in the literature search were public dental healthcare services and dental workforce, Jazan region, the initial step of the search included the identification of the data related to the main variables included in the study. The second step involved the selection of the resources that met the inclusion criteria, and the third step involved the comprehensive reading of the collected articles. Finally, the last step involved checking the references of the identified articles to identify further studies that were not identified previously in steps one and two.

Published peer-reviewed literature and government documents on oral health or the oral health system in Jazan were analyzed if they met the following criteria: they were related to the oral health system in Jazan, if they assessed dental health services and /or provided information on related factors (demographic information on the population of Jazan, types of MOH dental clinics), and if they were written in the English language. The analysis included also publicly available documents from the MOH Statistical Yearbook of the Ministry of Health [6], along with information from the General Authority of Statistics in Saudi Arabia [23-25]. These documents included information on the number and locations of facilities, and the structure of dental services offered. The documents also provided demographic information on oral health providers who work in MOH dental clinics, as well as the number of dental schools and dentists graduating annually.

A data extraction form was developed to collect information on six main categories from each document: Governorate (Mohafadat in Arabic) name, population number, type of health facility (Primary Health Care Centers and hospitals), number of oral providers (dentists, hygienists, and assistants), and the ratio of dentists-population. To present quantitative data, frequency and percentages were chosen as summary measures. Main variables were extracted from the studies, summarized, and presented according to

their frequency of occurrence in the studies. Thus, all relevant topics were extracted from the studies.

## RESULTS AND DISCUSSION

There are 152 PHCs and 22 hospitals serving people in Jazan with 103 (59.2%) PHCs and 21 (12.1%) hospitals including a dental component. In Sabya City,

(Table-1). 16 out of 21 PHCs had dental clinics, which is the highest number of PHCs compared to other cities in Jazan. Some cities do not have dental services provided by PHCs, such as Al Harth and Atwal, which have four and five PHCs respectively but do not include a dental clinic.

**Table-1: Descriptive Statistics of MOH Facilities in Jazan region**

#	Governorate (Muhafadat)	Population							Health Facility with DC/T		Providers (Dentists) PHCs / Hospital				Dentist - Population Ratio
		Total population	S			Non- S			PHCs	Hospitals	Resident	Registrar	Consultant	T(%)	
			F	M	T	F	M	T							
1	Jazan	134764	42963	49103	92066	10966	31732	42698	13/15	3/4	13/8	0/10	0/6	37(17.7)	1:3,642
2	Sabya	228375	89239	86488	175727	18401	34247	52648	16/21	1/1	17/3	0/4	0/0	24(11.5)	1:9,515
3	Abu Arish	197112	81931	82140	164071	9564	23477	33041	12/19	2/2	12/7	0/5	0/2	26(12.4)	1:7,581
4	Samtah	147330	57849	55646	113495	13361	20474	33835	12/18	1/1	12/5	0/1	0/0	18(8.6)	1:8,185
5	Al Harth	18586	3285	14668	17953	278	355	633	0/4	1/1	0/2	0/0	0/0	2(1.0)	1:9,293
6	Damad	71601	28100	28138	56238	5959	9404	15363	3/7	1/1	3/2	0/0	0/0	5(2.4)	1:14,320
7	Ar Rayth	18961	8420	9871	18291	123	547	670	2/4	1/1	3/1	0/0	0/0	4(1.9)	1:4,740
8	Baysh	70421	28114	27792	55906	4915	9600	14515	14/14	1/1	14/3	0/1	0/0	18(8.6)	1:3,912
9	Farasan	17999	7682	8302	15984	556	1459	2015	3/3	1/1	3/4	0/1	0/0	8(3.8)	1:2,249
10	Ad Dair	58494	26312	27073	53385	1269	3840	5109	3/10	1/1	4/1	0/0	0/0	5(2.4)	1:11,698
11	Ahad Al Masariha	110710	47564	45669	93233	6002	11475	17477	8/12	1/1	8/3	0/0	0/0	11(5.3)	1:10,064
12	Al Aydabi	31735	47564	45669	27419	1305	3011	4316	2/4	1/1	3/2	0/0	0/0	5(2.4)	1:6,347
13	Al Aridah	76705	13198	14221	66133	4095	6477	10572	7/8	1/1	5/4	0/0	0/0	9(4.3)	1:8,523
14	Ad Darb	69134	32900	33233	52733	2463	13938	16401	4/4	1/1	3/2	0/2	0/0	7(3.3)	1:9,876
15	At Tuwal	54326	25448	27285	48690	2115	3521	5636	0/5	2/2	0/4	0/0	0/0	4(1.9)	1:13,581
16	Harub	29064	24882	23808	26675	803	1586	2389	3/5	0/1	3/0	0/0	0/0	3(1.4)	1:9,688
17	Fayfa	29793	13228	13447	27096	850	1847	2697	1/3	1/1	0/1	0/1	0/0	2(1.0)	1:14,896
Total		1365110	545197	559898	1105095	83025	176990	260015	103/152	21/22	104/52	0/25	0/8	189	1:7,073

**Abbreviations:** PHCs, Primary Health Care Centers; S, Saudis; Non-S, non-Saudis; F, Female; M, Male; DC, Dental Clinic; T, Total

Based on the MOH statistical yearly book, there are 287 oral health providers, including 209 dentists, 76 dental assistants, and two dental hygienists who are working in MOH facilities in Jazan. 103 PHCs included 110 dental clinics in seven areas in the Jazan region (Table-2). Jazan City as central area has 13 PHCs with 15 oral providers, two of whom are study abroad. The highest number of dental clinics in the

region is 25 PHCs located in the western area (including Sabya, Damad, and Harub). This area includes 23 dentists, two of whom study abroad. There are 21 hospitals that include dental components, which include 60 dental clinics that provide dental services (Table-3). Jazan City has a high number of hospital and dental clinics, with three and 20 respectively. Abu Arish has two hospitals with eight dental clinics.

**Table-2: Descriptive Statistics of MOH Primary Healthcare Centres (PHCs) in Jazan**

Governorate (Mohafadat)		Population	Health Facility		Providers (Dentists) PHCs				Dentist-Population Ratio
Area	Cities		Clinic Number	PHCs	Resident	Registrar	Consultant	Study Abroad	
Central	Jazan	134764	13	13	13	0	0	2	1:8,984
Northern	Baish, Al Darb Al Sheqiq, Harub	168619	22	21	19	0	0	2	1:8,029
Southern	Al Harth, Ahad Al Masarihah, Samtah, Atwal Farasan	348951	23	23	22	0	0	3	1:13,958
Eastern	Al Dair	58494	3	3	3	0	0	0	1:19,498
Western	Sabya, Dama, Harub	329040	25	21	21	0	0	2	1:14,306
Mountain	Fyfa, Al Aydabi	61528	3	3	4	0	0	0	1:15,382
Meddle	Abu Arish, Aridah,	273817	21	19	22	0	0	0	1:12,446
<b>Total</b>		1365110	110	103	104	0	0	9	1:12,081

Abbreviations: PHCs, Primary Health Care Centers

**Table-3: Descriptive Statistics of MOH Hospitals in Jazan**

#	Governorate (Mohafadat)	Population	Health Facility		Providers (Dentists) Hospital				Dentist-Population Ratio
			Clinic Number	Hospitals	Resident	Registrar	Consultant	Study Abroad	
1	Jazan	134764	20	3	8	10	6	5	1:4,647
2	Sabya	228375	4	1	3	4	0	0	1:32,625
3	Abu Arish	197112	8	2	7	5	2	1	1:13,140
4	Samtah	147330	3	1	5	1	0	0	1:36,832
5	Al Harth	18586	1	1	2	0	0	0	1:9,292
6	Damad	71601	1	1	2	0	0	0	1:35,800
7	Ar Rayth	18961	1	1	1	0	0	1	1:9,480
8	Baysh	70421	2	1	3	1	0	0	1:17,605
9	Farasan	17999	6	1	4	1	0	0	1:3,600
10	Ad Dair	58494	1	1	1	0	0	0	1:58,494
11	Ahad Al Masarihah	110710	2	1	3	0	0	0	1:36,903
12	Al Aydabi	31735	1	1	2	0	0	0	1:15,867
13	Al Aridah	76705	2	1	4	0	0	0	1:19,176
14	Ad Darb	69134	3	1	2	2	0	0	1:17,283
15	At Tuwal	54326	3	2	4	0	0	0	1:13,581
16	Harub	29064	0	0	0	0	0	0	0
17	Fayfa	29793	2	1	1	1	0	0	1:14,897
<b>Total</b>		1365110	60	21	52	25	8	7	1:14,838

Abbreviations: PHCs, Primary Healthcare Centers

Almost half, 104 (49.7%) work in PHCs and 85 (40.7%) work in hospitals in the region. Only 4 (1.9%) as administrative and 16 (7.7%) of the providers pursue their graduate studies whether in the country or abroad (Table 1 & 2). Most (76.6%) of the dentists are residents, eight are consultants, and 25 work as registrars. Most of oral providers in Jazan are male with 85 males and 12 females in PHCs. Of the 37 (17.7%) dentists who work in Jazan city, most work in the government dental center in the city. These providers served 134,000 people, which represents one provider per 3,600 people. Since there are no dental clinics in Atwal and Al Harth, no dentists work in those areas. Abu Arish has 26 (12.4%) dentists serving 197,000 people, which represents one provider per 7,000 individuals, followed by Sabya with 24 (11.5 %)

dentists serving 228,000 individuals, which represents one provider per almost 10,000 people.

This study focused on Jazan region, one of the thirteen regions of the Kingdom of Saudi Arabia. Jazan region (also spelled Jizan, Gizan, or Gazan) situated on the coast of the Red Sea, in the southwest corner of Saudi Arabia. The population is mostly Saudi nationals with some expatriates [22]. Jazan region has a population of approximately 1.6 million people, with Saudi nationals making up 1.2 million [23]. Approximately 54.2% are male and 45.8 % are female. Most of the region's residents live in the major cities like Sabya, Jazan, and Abu Arish with 228,000, 197,000, and 134,000 residents respectively [24].

PHC provide preventive services and basic dental treatments such as simple composite and amalgam fillings, oral hygiene, scaling and root planning. With regards to general hospitals, there are 21 hospitals which provide specialized services such as Maxillofacial surgery, Endodontics, and complex treatments that are not available from governmental PHCs. These services were provided through 60 dental clinics. Thus patients needing more specialized treatment will be referred to specialized dental clinics as discussed above that have long waiting lists. This can create barriers to care service utilization and the overall quality of healthcare.

There are 209 dentists in Jazan region, which represents a ratio of one MOH-affiliated dentist to almost 6600 people. This result is higher than the MOH provider-population ratio in Riyadh, Jeddah and the Eastern region, which was (1: 9,700), (1: 12,600), and (1: 8700) respectively. This shortage in oral health providers indicates that many people in the region might not receive preventive and basic dental treatment and advanced treatments, or that there were difficulties accessing these services.

Moreover, this study found that a high percentage, 17.7 % of the providers work in Jazan City. These practitioners provide service to more than 134,000 people, which represent a dentist-population ratio of 1:3600. Some areas such as Sabya, Al Darb, Atwal, Aldayer, Harub, and Fyfa have few practitioners providing dental service compared to larger populations, which indicates that one provider serves more than 10,000 people. Many cities in Jazan such as Al Harth and Atwal do not have dental service at all. The residents in these cities must travel to PHCs and hospitals to receive the service, thereby increasing the workload at some MOH facilities, which leads to lower accessibility and quality of service. Despite the high number of providers, there is a need for a better dental workforce distribution that provide preventive and basic dental treatment. It has been reported that the physical location of the dental clinic is the most important factor influencing utilization of dental services [26]. Indeed, transportation difficulties are a commonly reported barrier to dental care access [27]. There is an unequal distribution of dental workforce even at the country level since over 80% of the dentists in the KSA were working in the cities of Riyadh or Makah, or the Eastern province [6]. A recently published research study of the distribution of dental clinics, private and public) within s Saudi Arabia metropolitan area (Al Medina) found that the majority of the clinics were located within 3 km form the city centre compromising physical access to dental healthcare [28].

Based on the descriptive results of the study's variables, the majority (76.6%) of the providers work as residents in PHCs, which indicate that most of providers in PHCs have a Bachelor degree in dentistry

and are only able to provide only basic dental treatment to the people of Jazan region. Also, this high number of providers in PHCs might be due to the few positions available in postgraduate programs in the country, or due to a lack of support from their organizations to pursue their studies. In addition, there are only two dental hygienists who are considered as the first line of dental prevention. Some studies found that dental hygienists are more likely to offer dental preventive services in their work than other dental providers [29]. This indicates that preventive activities in the region are very low. There are only eight dental public health (DPH) practitioners, which also helps to explain why preventive activities are very low in the region. DPH practitioners are more likely to practice preventive care than other oral providers [29]. The most recently published data about the specialties of dentists in Jazan region 2017, included information about dentists' specialties working both in private and public sector in the region [30]. This study found that the majority of region's practicing dental professionals are general practitioners, which means that they had a bachelor's degree followed by prosthodontics and maxillo-facial surgeon [30].

It is noteworthy that only 22% of the dentists in the Kingdom are actually Saudis, with the rest being foreign nationals. These statistics demonstrate that the KSA faces challenges in developing a Saudis oral healthcare workforce able to meet the country's general and specialized dental needs. Currently Saudi dental schools graduate more than 1000 graduates per year [30]. There are seven dental schools in Riyadh, five in Makkah, three in Al Qasseem, and two in the Eastern province. The low number of dental health professionals in Jazan could be due to the paucity of dental schools in the region, with only one dental school for the region. In 2018, there were about 99 students 46 males and 53 females who graduated from the College of Dentistry in Jazan. This number was the fourth highest number of dentists graduating among Saudi dental schools [31]. Approximately 83 dentists were enrolled in postgraduate programs in 2018; about 64 were enrolled inside the KSA, 47 (56.0%) of whom were male and 17 (20.2%) of whom were female. In addition, 19 (16 male and 3 female) (19.0%) dentists studied abroad. There are approximately 100 male and female dental graduates every year in Jazan [31]. This number is considered the fourth highest number of dentists graduating among Saudi dental schools. The large number of graduates makes it hard to find a job, especially in the public sector, where most of the graduates prefer to work due to long-term security and postgraduate education opportunities. However, the MOH plans to spend over 23 billion Saudi riyals on a new initiative to meet the government's 2030 Vision [32]. The study opens a window into the government's plans to address this issue.



This study was the first effort to describe the public dental health services in the Jazan region of the KSA with respect to the dental healthcare facilities, oral health providers and population characteristics. However, there are several limitations that should be considered when utilizing the results of this study. First, there is a lack of data regarding oral health service and oral providers in the Jazan region. Documents used in this study provided information on the number of dental services, distribution per type of services delivered and number of active MOH affiliated dentists and dental allied professionals. However, it did not provide adequate information on the type of service offered, accessibility to dental services and characteristics of dental providers such as type of specialty. The study is also limited due to the fact that it only considered dental services based on the collected documents, but the system in reality has been changing so rapidly that previous documents might not reflect the most recent developments.

## CONCLUSIONS

There are numerous issues in encountering dental service in the Jazan region, such as the distribution of providers and services, which point to why the region experiences lower accessibility and quality of dental treatment. The low number of dental hygienists and assistants might be one of reasons that there are a low number of preventive activities in the region. Lastly, the type of facility (PHCs or hospitals) is important in considering distribution, since each facility has a different function within the system. Further primary research focusing on different cities or geographical areas in the Jazan region is needed to validate these findings.

## Ethical Statement

Only openly accessible, non-identifiable data and information was used for this research, and therefore ethics approval was not necessary.

**Declaration of Competing Interest:** The author declared that there is no conflict of interest.

## ACKNOWLEDGMENTS

Authors would like to acknowledge Jazan University which has supported this study at the University of Western Australia. This support is highly acknowledged and appreciated. The authors would also like to extend their sincere gratitude to the school authorities at the University of western Australia for their continuous support throughout the paper.

**Funding:** The study conducted with no financial support.

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