

EDITORIAL

Current Status and Utilization of Oral and Dental Health Services in Gezira State (2005-2009)

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Abstarct:

Objective: This study aimed to assess the status of the present dental and oral health services in the Gezira state.

Methods: The study areas comprise of three clusters: urban, suburban and rural. Five study sites in the urban area, four sites in suburban area around Wad Medani and 12 sites in the rural area were chosen from the six localities of Gezira State . The households study sample was as follows: 100 in the urban area, 108 in the rural area and 52 in the suburban area. The study tools were direct pre-coded questionnaires, household survey and observation checklist. The procedure involved household interview to evaluate dental status of dental health professionals, equipment and materials in order to assess dental health services. Descriptive statistics was used to analyze and present the data. The SPSS Statistical Programme using Microsoft Windows was used.

Results: This result revealed absolute lack of dental services in the rural and relative lack of services in suburban areas. The present unit is old and most of them were incomplete and not functioning. This was the reason that some of rural and suburban populations seek oral health services in Wad Medani health institutions. Most of the patients irrespective of their residence preferred treatment at private dental clinics because they expect better care due to good facilities

Recommendation: Establishing new dental units with good facilities distributed in different localities and rehabilitation of dental units provided to Elhasaheisa and Elmanagil dental departments with equipments and dental specialties to become specialized dental hospitals to cover the population needs and demand dental services for the surrounding areas.

Introduction:

Health services or health systems are defined as means for provision of services that include preventive, curative, promotive and rehabilitative health care at primary, secondary or tertiary levels. This is achieved through the provision of qualified human resources, equipment, space, auxiliary staff and medicaments .¹ Dental health services vary in different parts of the world. The national income and the overall level of development of nations and the quality of dental care is reflected by high dentists/population ratio². In the UK the ratio of dentist/population was 1:2100 in the year 2000. In the same year, in South Africa, a medium income country the ratio was 1:9603. In India as an example of a low-income country, the ratio was (1:36538) while in the Sudan the ratio is 3 times lower (1:100,000) than in India. However, this ratio varies widely, being high in urban areas (1:30.000) compared to as low as 1:130,000 in rural areas.^{2, 3}The highest ratio was

EDITORIAL

noted in Khartoum where, the majority of dentists was working. The WHO standard of dentist/population ratio is (1:10 000).

The dentist/population ratio is a crude measure or indicator of the quantity of dental services, however, the quality of services is not affected by this ratio only, but also by other factors such as, availability, accessibility, acceptability, type of dental equipment and dental materials available. Other factors that may also affect both the quality and quantity of oral health services including, the type of health system, pattern of wealth distribution, political influences, capacity building and the level of population education and number of health professionals. The dental services in Gezira State, are similar to dental services elsewhere in Sudan, and are delivered through National or Private Health Service¹

. In Sudan 80% of dental health services are found in urban areas, compared to 20% in rural areas. This distribution of services is not balanced with population distribution.

Although the dental health service in the Gezira state is better compared with other states and poor when compared with Khartoum, there are other health problems including inefficiency and unequal distribution of human resources, shortage of dental equipments, instruments and other facilities required for the provision^{1,3}

Profile of dental services in the Sudan:

Oral health services utilization in Sudan is influenced by different factors and shows differences between urban and rural areas. The availability of services is almost lacking in rural areas and available to some extent in urban areas. However, the accessibility of these services is far from reach of people in rural areas and not affordable to many of them.⁴ The oral health treatment availability can be studied at the three levels of health services. It is clear that there are meager services availability at the primary level in the health units and dressing stations. Some services are available including tooth extraction, fillings and scaling, antibiotics prescription or referring for advanced levels by dental assistants at the health centers and rural hospitals. Even at the tertiary level health includes minor surgery was available. While other treatments such as root canal treatment, orthodontics and/or prosthesis can be provided only by private dental clinics because they are costly and affordable only by a very small sector of people. Major oral surgery operations are available only in capital Dental Hospitals. Therefore, all cases requiring such surgery are referred to Khartoum Teaching Dental Hospital in Khartoum city.^{4,5}

In Sudan, the delivery of oral and dental health care services, like other medical services is provided in the government hospitals through a national health system. A small fee is charged for those services. Some people are managed through the health insurance system. Other categories, like poor people are helped by some charity agencies like El Zakaat⁵. The above system applies also to Gezira province. However, the health insurance system covers certain oral health services, including tooth extractions and/or minor oral surgical operations.

The total number of dentists on the dental register of the Sudan Medical Council is 2665 dentists⁶. However, less than 50% of them are still practicing in Sudan. The remainder has migrated to other

EDITORIAL

countries mainly Saudi Arabia and other Gulf States. It should be emphasized that three main problems should be considered whenever dental manpower is being addressed in Sudan. These include mal-distribution of the available dental manpower, immigration to richer countries and lack or absence of continuous and in-service training.^{1,3}

In the year 1970 the first dental school was founded as a department within the Faculty of Medicine, University of Khartoum. The first batch of 20 dental students was admitted and all of them were graduated with a degree of Bachelor of Dental Surgery (B.D.S.), Faculty of Medicine, University of Khartoum in March 1976.

Till 1994 no postgraduate training for dentists was undertaken. A three years training programme in restorative dentistry started in 1995 and master programme in all disciplines started in 1999. At present it was observed that the dental care provided by Wad Medani dental hospital is grossly inadequate, not only for rural population who are compelled to seek dental health care at this facility, but even for the urban population. The situation described above apparently indicates serious shortage of dental services in Gezira state⁴

Material and Methods:

Study area and study strategy:

This is a cross-sectional analytical study conducted in the Gezira state. The Gezira state is located at the centre of the Sudan and is 26075 Square k.m. with an estimated population of 3,621,956 (Census projection 2003). Its central location makes it easily accessible for medical and dental health services. Its health institutions provide medical health services, some of them provides oral health services. The Gezira state is comprised of seven localities (Mahalyias): Wad Medani Elkobra, South of Gezira, East of Gezira, El Managil, El Hasaheisa, ElKamlin and Om El Ghora . The dental health services in Gezira state are provided in ten hospitals and six health centres. The dental health facilitates that are providing dental services representing only 7% of the medical health institutions. The Gezira state was therefore selected and was the site for this study. In Wad Medani city (The capital), there are nine hospitals and thirty nine health centres, only two hospitals and three health centres provide dental health services.

Sample size:

Simple random sampling technique was used . Since a cluster sampling design first was chosen (rural and urban) as in the previous study, a larger sample is required because of the design effect. The design effect might be estimated as 2. This would mean that to obtain the same precision as with the simple random sampling. The sample size must be multiplied by 2 to give 208.

This number was divided proportionately between rural sampling frame of households and urban sampling frame to give a sample of 100 for urban , 108 for rural and 52 suburban households calculated as the average of half of the urban and rural household.

Survey instruments to assess available resources(2005-2009)

1- Health facility checklist .2-Household survey questionnaire. The instruments tools used to collect data in this study are known tools and used in many previous studies. The data collected in this study by dentists and final students of the Faculty of Dentistry, Gezira University after training

EDITORIAL

and testing all questionnaires in the Dental Hospital.

Statistical Analysis Method:

Using descriptive statistics the data with error such as extreme values or outliers were removed from further analysis adjustment. Descriptive statistics was also used to check the data, health services description or community needs parameters. The SPSS Statistical Programme using Microsoft Windows was used to process and analyze the data and for clearing the data and check up in variable and relation between variables.

Ethical Approval:

Written permission to conduct the study was obtained from Ministry of Health Gizera State, general director of health affair and health institutions in selected study areas

Results:

Study showed the sample distribution of household respondents reported for dental health care during the period of the study. The illiterate and those with basic education were higher in the rural areas with a relative frequency of 42 (21.1%) and 77 (38.7%) respectively.

Table (1) shows that most of the respondents in the sample have received dental treatment before. The urban areas received their treatment in the dental health unit 84 (40.2%) near to their residence, in the private facilities 9 (4.3%) and in dental hospital at Wad Medani 39 (18.7%). The rural areas 70 (33.2%) had their treatment at health units, 31 (14.7%) in the dental hospital and 17 (8.1%) in the private clinics, while in the suburban in dental hospitals 10 (17.5%) in dental health units 16 (28.1%) and in the private clinics 5 (8.8%). The table also shows that one third of the sample from the urban areas were not utilizing dental services, while approximately 50% in rural and suburban area were not utilizing dental services, although a large proportion of them were suffering from some dental problems.

Table (1): Place of dental health services utilization by the study population in different study areas

TREATMENT FACILITY	Urban		Rural		Suburban	
	N	(%)	N	(%)	N	(%)
Dental hospital	39	(18.7)	31	(14.7)	10	(17.5)
Private clinic	9	(4.3)	17	(8.1)	5	(8.8)
Dental health unit	84	(40.2)	70	(33.2)	16	(28.1)
Dental hospital + private clinic	1	(0.5)	2	(0.9)	0	(0)
Dental hospital + dental health unit	1	(0.5)	0	(0)	0	(0)
No utilization of dental facilities	75	(35.9)	91	(43.1)	26	(45.6)
Total	209	(100)	211	(100)	57	(100)

Table (2) shows the status of instruments and tools available at Wad Medani (urban) studied dental health institutions. The results shows that there are no or incomplete instruments for orthodontic or prosthodontic extraction, filling and paedodontics services.

EDITORIAL

Table (2): The availability and status of dental equipments and materials at the urban study area

ITEM	El-dibagha	Elmazad	El- Gism Alawal	Al-Iishlak	Maringan
Dental machine & dental chair	Complete	Complete	Complete	Complete	Complete
Extraction Instruments	Complete	Incomplete 75%	Incomplete 75%	Complete	Complete
Periodontal instrument	Complete	Incomplete 75%	Incomplete 50%	Complete	Complete
Filling instrument / materials	Complete	Incomplete 50%	Incomplete 75%	Unavailable	Complete
Orthodontic treatment instruments	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
Prosthesis Instruments	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
Peadodontic treatment instruments	Unavailable	Unavailable	Incomplete 50%	Unavailable	Unavailable
Dental surgical instruments	Incomplete 50%	Unavailable	Unavailable	Incomplete 15%	Incomplete 25%
Sterilization instruments	Hot oven	Hot oven	Hot oven	Hot oven	Hot oven

Complete Dental unit: Operating dental chair and dental machine

Complete: Full set of operating instruments (All pieces of set present)

Table (3) shows that in the suburban studied sites the dental units and instruments were only present in Omsonot. The dental unit and extraction sets present were complete, the periodontal and filling instruments were incomplete, while other instruments were unavailable.

Table (3): The Availability and Status of Dental Equipments and Materials at Suburban Study Area

ITEM	Om- sonot	Atrra	Al- kariba
Dental machine and dental care	Complete	Unavailable	Unavailable
Extraction instruments	Complete	unavailable	Unavailable
Periodontal instrument	Incomplete 50%	unavailable	Unavailable

EDITORIAL

Filling instrument / materials	Incomplete 50%	Unavailable	Unavailable
Orthodontic treatment – instruments	Unavailable	unavailable	Unavailable
Prosthesis instruments	Unavailable	Unavailable	Unavailable
Peadodontic treatment instruments	unavailable	unavailable	Unavailable
Dental surgical instruments	unavailable	Unavailable	Unavailable
Sterilization instruments	Hot oven	unavailable	Unavailable

Table (4-A and B) shows the equipments and instruments needed for oral health services at different rural sites. The tables show the unavailability of dental facilities in five studied sites. The other seven sites were acting with dental auxiliary staff but without suitable dental unit and instruments. Regarding extraction, periodontal and filling instruments are incomplete in five sites. There are two sites: Almadina Arab and Elhoda that only provided tooth extraction with incomplete sets of instruments. The sterilization tools available were water boilers in all rural sites while the urban sites were hot ovens. The autoclaves sterilizers were not available even in the urban study areas.

Table (4-A) The availability and status of dental equipments and materials at the rural study area

ITEM	Rofa	Almasoudia	Abu-oshar	Wad-ballal	El Masalamia	El – guneid
Dental unit	Incomplete 25%	Unavailable	Complete	Complete	Unavailab le	Complete
Extraction Instruments	Incomplete 25%	Unavailable	Complete	Complete	Unavailab le	Complete
Periodontal Instruments	Incomplete 50%	Unavailable	Complete	Complete	Unavailab le	Incomplet e 75%
Filling instrument / materials	Incomplete 50%	Unavailable	Complete	Complete	Unavailab le	Unavailab le
Orthodontic treatment – instruments	Unavailable	Unavailable	Unavailab le	Unavailable	Unavailab le	Unavailab le

EDITORIAL

Prosthesis Instruments	Unavailable	Unavailable	Incomplete 50%	Unavailable	Unavailable	Unavailable
Peadodontic treatment instruments	Incomplete 50%	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
Dental surgical instruments	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
Sterilization Instruments	Unavailable	Unavailable	Boiler/ hot oven	Boiler	Unavailable	Boiler

Table (4-B) The availability and status of dental equipments and materials at the rural area

ITEM	El- madina arab	Al- hoda	Al- hosh	El- azaza	El Gamousi	Om elghora
Dental unit	Incomplete 50%	Incomplete 50%	Incomplete 50%	Unavailable	Unavailable	Unavailable
Extraction Instruments	Incomplete 75%	Incomplete 75%	Incomplete 75%	Unavailable	Unavailable	Unavailable
Periodontal Instruments	Unavailable	Unavailable	Incomplete 50%	Unavailable	Unavailable	Available
Filling instruments/ materials	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Available
Orthodontic treatment instruments	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Available
Prosthesis Instruments	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
Peadodontic treatment instruments	Unavailable	Unavailable	Unavailable	Available	Unavailable	Unavailable

EDITORIAL

Dental surgical instruments	Unavailable	Unavailabl e	Unavaila ble	Available	Unavaila ble	Unavailabl e
Sterilization Instruments	Boiler	Boiler	Boiler/hot oven	Boiler	Unavaila ble	Unavailabl e

Study shows that tooth extraction was the most common treatment provided and received by study sample in the urban, rural and suburban areas 119 (59.9%), 111 (53.2%) 31 (54.4%) respectively. Restorative dental treatment was provided less frequently.

Table (5) shows that the number of respondents seen and treated by specialized dentist was 3 (2.3%), general dentist 125 (94%) in urban areas. In the rural areas those who were treated by a specialized dentist were 6 (2.8%), general dentist 51 (24.2%) and by dental assistants were 56 (26.5%). In the suburban 26 (45.6%) received their treatment by a general dentist.

Table (5) Distribution of dental manpower providing dental treatment at different study areas

MANPOWER	Urban		Rural		Suburban	
	N	(%)	N	(%)	N	(%)
Dental specialist	3	(2.3)	6	(2.8)	2	(3.5)
Dentist	125	(94.0)	51	(24.2)	26	(45.6)
Dental assistant	4	(3.0)	56	(26.5)	3	(5.3)
Medical assistant	1	(0.7)	7	(3.26)	0	(0)
Not seen by personnel dental	76		91	(43.1)	26	(45.6)
Total	209	(100)	211	(100)	57	(100)

Figure (1) and table (6) shows that 113 (55.4%) of patients in the urban areas believed that the dental services offered to them were either excellent or good compared to the weak services and unsatisfied respondents 170 (82.6%) 42 (76.3) for rural and suburban areas respectively. only 6.3% and 20% patient from rural and suburban areas respectively rated the services offered to them between excellent and good .

EDITORIAL

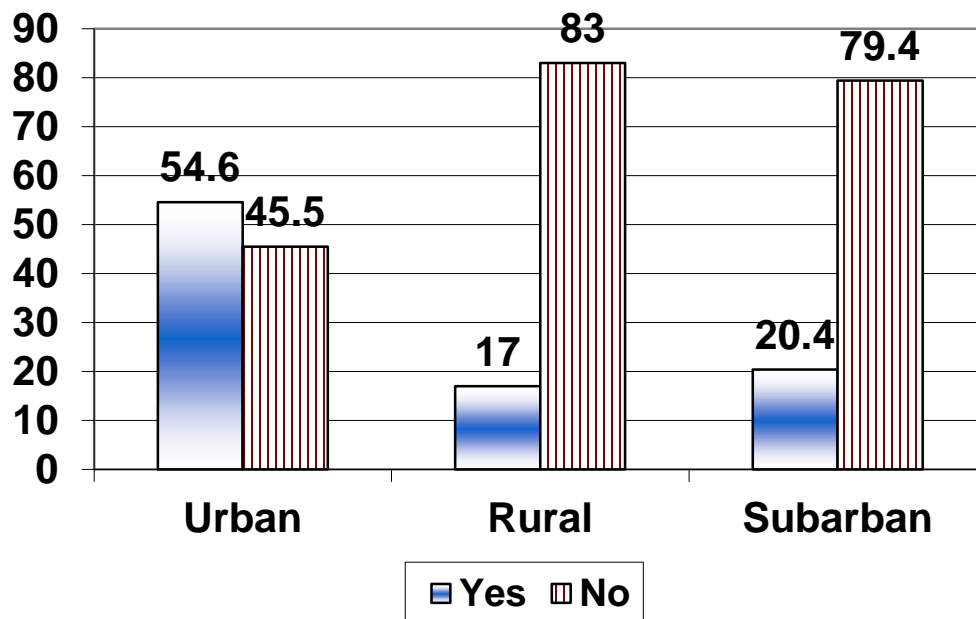


Figure (1) Level of Satisfaction from the dental service offered

Table (6): Level of satisfaction of respondents

GRADE	Urban		Rural		Suburban	
	N	%	N	%	N	%
Excellent	11	(5.4)	0	(0)	1	(1.8)
Very good	74	(36.3)	6	(2.9)	5	(9.1)
Good	28	(13.7)	7	(3.4)	5	(9.1)
Fair	5	(2.5)	23	(11.2)	2	(3.6)
Weak	86	(42.1)	170	(82.6)	42	(76.3)
Total	204	(100)	206	(100)	55	(100)
Missing	5	-	5	-	2	-

Figure(2) shows that the majority of dental staff (> 80%) in the study area were not satisfied with the provided dental health services. More than 80% were not satisfied.

EDITORIAL

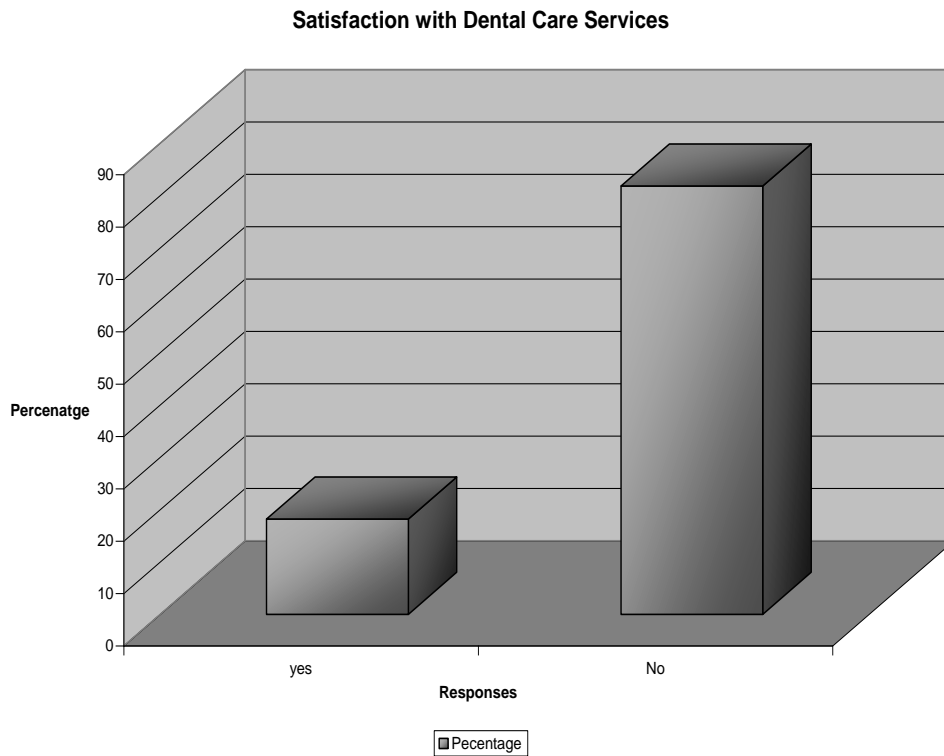


Figure (2) Dental staff satisfaction with dental health services in The study sites clinics

Dental services were provided in all urban studied sites health institution, four health centres and one general hospital (100%). In the rural areas dental services were provided in 7 (58.3%) studied sites while in suburban there is only one health institution with dental facilities but not providing any dental services. Only two dentists covering two dental units out of twelve rural areas. The dental assistants are also very few, covering only five rural hospitals out of eleven. In the suburban areas neither a dentist nor a dental assistant was available in the dental health units.

Figure (3) shows the availability of the essential basic general services in the study area. The availability of health education, water supply and electricity in urban sites was (87.8%), in the rural was (83.4%) while in the suburban was only (40.1%).

EDITORIAL

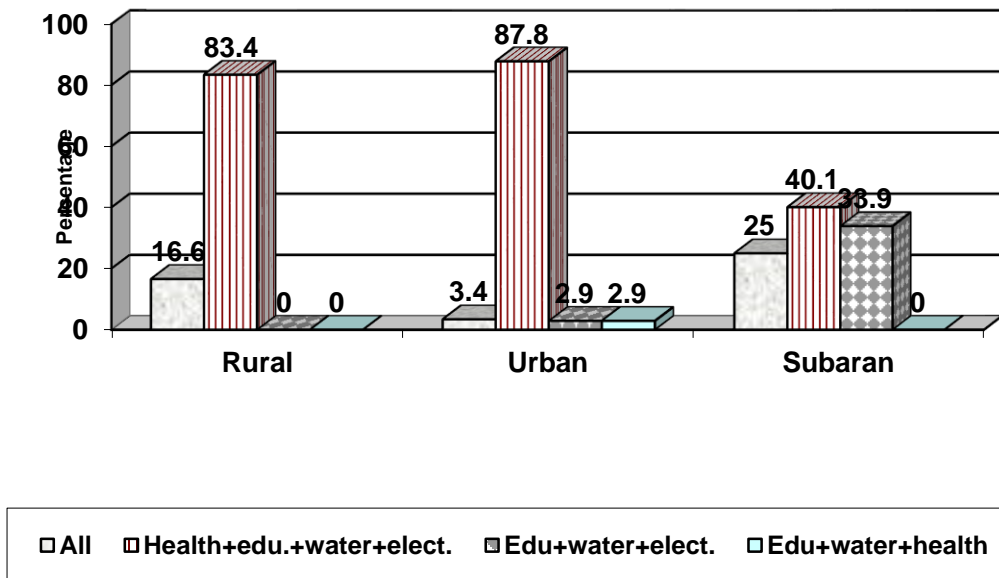


Figure (3) Availability of basic general services

Discussion:

This study documents information on the current status and utilization of dental services in Gezira state.

Most of the patients irrespective of their residence preferred treatment in the hospital and health units with proper facilities or prefer not to be treated inspite of complaints of the oral diseases. This is because other health institutions in suburban and some rural areas have little facilities for provision of required health services. Utilization of private health services is common in the urban area because health service are not available in suburban and rural areas, so some suburban and rural population seek dental services in urban health institution. although the fact that dental staff of health facilities and the majority of population investigated in the study areas were not satisfied with the provided dental health services. The urban population was more satisfied with provided dental services than the rural and suburban populations.

Many studies ^{3,10} concluded that utilization of health services is lower in the rural than urban areas due to unavailability and inaccessibility to the services. Patients in the urban settings were more satisfied with services than at rural settings and that the overall quality of services affect level of satisfaction, .

The present study showed that extraction of teeth was the most common treatment in urban,

EDITORIAL

suburban and rural health facilities. Other forms of treatment such as restoration of teeth were poorly provided; prothodontic and orthodontic treatment were not provided at rural and suburban dental services. However, a large proportion of the rural population are not exposed to any form of dental care, while the suburban population completely depend on the nearest urban dental facilities in the provision of dental services. This is obviously related to the apparent lack of dental services, where provision of some forms of traditional treatment is seen in the rural and suburban areas

In Sudan public dental services provide only limited emergency dental care such as pain relief, tooth extraction and/or scaling, while other forms of dental care is provided in private clinic^{3,6}. It is very clear that in most developing countries health problems other than oral health receives more priority by the government authorities in the health sector¹¹. This form of providing and utilizing of dental services differs in developed countries.

There are two main features of oral health services that are common to countries, regions and communities of the world. The first one is that they have some oral health services for meeting the needs of their population, the other is that these services are insufficient to fulfill these needs in the traditional curative and restorative rehabilitative way stated that national income and the overall level of development of nations and the quality of dental care as reflected by high dentist population ratio is good in developed as compared to developing countries. The previous Gezira locality study showed that the dentist population ratio is 1:130,000 and this ratio are even less than in Wad Medani city because the majority of all dentists are resident in Wad Medani, (16 out of 23 dentists). This ratio is good in Khartoum state (1:30,000) and other states may reach 1:100,000. However, 1, 3, 6 now the ratio is 1: 138 in Gezira state and 1:24000 in Wad Medani city. In the present study the population dentist ratio does not differ from the previous study although the number of dentists has increased. The number of the dentist registered in the Medical Council, now is 3653 and more than 95% of them are practicing in Khartoum state. Other countries showed better ratio such as India (low income) 1:36,000, South Africa 1:9,603 (medium income) and United Kingdom 1:2,100 (high income), and 1:4000 in Egypt. All these figures show that the number of dentists is deficient and maldistribution in Sudan is more than in any other country except the neighbouring African countries which have similar ratios at that time.²

The dental education in Sudan started in the year 1970. The intake in the University of Khartoum dental school at that time was 20 in the 1st batch.^{3,6}

This may explain the low dentist population ratio in Sudan. This ratio did not change although the number of dental faculties and students has increased because most of the graduates work in Khartoum state.

Dental services in Sudan especially in rural areas are based on the auxiliary staff due to lack of dentists. Each year only 20 – 30 trained medical nurses are enrolled for a 2-year training programme to be qualified as dental assistants. Their main role is oral hygiene instruction, extraction and simple fillings.³

Dental services located at Wad Medani City are at a far distance to rural and suburban areas where the majority of the populations live and so they cannot make use of those services. That situation

EDITORIAL

usually negatively affects utilization of these services. This finding is consistent with a previous report stated⁴ dental services are meager at primary health care level, stated that the main objective of primary dental care is to relief acute pain of dental origin. The removal of a painful tooth does not require the service of qualified dentist. Even these simple services are not available to the vast majority of the population of Gezira state. This result agrees with that of Adiko et al, (1990)¹² where the authors stated that the orodental health care in Africa is distinctive because of the weakness of substructure to supply the needs for dental care. That showed how the Ivoirians take interest in orodental care. It notifies that: Firstly, patients only make an appointment with the dentist particularly when advanced lesions occur (92.76% of cases) as unbearable painful infections (acute pulpal inflammatory disease, phoenix abscess); bulky cellulites. Secondly, they are inclined not to show up for their appointments, when painful symptoms disappear.

The dental services in Sudan are limited to emergency services due to lack of functioning equipments and shortage of dental materials. Almost all other forms of dental services are rendered to those who can afford to pay. The present study has reached similar conclusions since elements of standard dental care delivery including equipments and materials are deficient in Gezira state.
1, 4, 6

Recent studies indicated a great need for dental treatment and preventive services in dentally underserved communities in the Southern Africa region. Geographic inaccessibility, limited financial resources, and a maldistribution of dental personnel are the main barriers to oral health care in Africa.¹³

However, the present study has reached similar conclusions. The study explained the shortage in dental resources beside essential infrastructure, basic general services, lack of water, electricity, health institution which is very important for preventive and curative dental health services in urban, suburban and rural areas.

European countries spend up to 7 – 10% of the national health budget on oral health services which means a lot of resources including services and manpower while In Sudan very little is spent on health services particularly dental services in relation to national income.¹

Conclusions and Recommendations:

This study showed a large magnitude of dental problem in Gezira State faced with meager dental health services especially in rural and suburban areas which affect utilization together with problems of accessibility, acceptability and affordability. Dental services are lacking the preventive and promotive component.

The reported data in this research showed a low dentist – population ratio, and prevalent oral health problems. Effort and commitment from the state national, federal government and health related sectors is highly needed to promote oral health services.

There is an urgent need to develop policy and a strategy for comprehensive oral health services in Gezira state. Therefore, there is a need to determine the amount of oral health care needed, assess the level of present and future demand for oral care and establish oral health facilities and ensure

EDITORIAL

their optimal utilization.

The following recommendations may be suggested to make this plan feasible:-

- 1- Development of national standards for dental and oral health services to be used for assessment of service(buildings, staff, equipment and materials)at different levels
- 2- The establishment of qualitative and quantitative manpower production goals, linked with national dental/oral health goals, based on dentist-population ratio, and implementation of extensive training courses to develop skills and knowledge to different categories of dental health professionals.
- 3- Establishment of new dental units in all Gezira state locality and rehabilitation of dental units provided to Elhasaheisa and Elmanagil dental departments with equipments and dental specialties to become specialized dental hospitals to cover the population needs and demand for curative and preventive dental services for the surrounding areas.

EDITORIAL

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