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The Impact of Oral Health Practice and Oral Health Knowledge Level of Caregivers on Periodontal Status of Some Special Needs Adults in Aseer Region, Saudi Arabia

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Abstract

Background: The objective of the present study is to evaluate the impact of oral health practice and knowledge level of caregivers on periodontal status of adults special needs in Aseer Region, Saudi Arabia. **Methodology**: A cross-sectional study was conducted on 180 caregivers and 180 adults with special needs divided into three equal groups (n = 60 + 60 + 60) based on type of disabilities: Visual impairment group (I); moderate mental retardation group (II); and physical impairment group (III). Questionnaire forms were used to assess the oral health practice and knowledge level of caregivers. The clinical examination of special needs adults was done to assess the effect of oral health practice and knowledge level of caregivers on periodontal status of adults special needs. All data were collected and analyzed by the SPSS statistical software and (ANOVA) to assess the variations in the mean and standard deviation (±SD) of clinical findings. **Results**: Acceptable periodontal, oral health knowledge, awareness and oral health practice were detected among caregivers, particularly, group (II) more than group (III) and group (I). But there were no significant differences in periodontal clinical parameter scores in the comparison between the study groups. **Conclusion**: It is concluded that the level of oral health practice and knowledge of caregivers included within the current study, were not effective in keeping periodontal health of special needs adults.

Keywords

Caregivers, Periodontal Knowledge, Special Needs Adults

1. Introduction

The health of the community is connected with the physical, mental and social health of an individual [1]. Additionally, oral health is a complementary portion of public health and the health of the oral tissues [2] [3]. Consequently, the advancing of periodontal disease is clear evidence for the decline of knowledge and awareness of oral health [4].

A disability is a lack of the normal ability and activity of the special needs individuals that compose a fundamental part of the community. It is predestined that there are about 500 million disabled in the world [5] [6]. The proportion of special needs patients who moved to adulthood stage is growing, due to the evolution of pediatric and newborn care [7].

In Saudi Arabia, disability is a considerable economic and social problem. According to 2000 demographic survey, it was revealed that 135,000 Saudi people are disability individuals [8]. Recently, Saudi Arabia has evolved in the economy with the improvement of special needs patient medical care [9] [10]. Many researchers revealed that poor oral hygiene and the pathological changes in periodontal tissues among special needs individuals are more than normal individuals [11]. The periodontal status in special needs patients is usually correlating with different factors such as the patients' age, disability type, socioeconomic status and dental care available [12].

Recently, the increasing in the consciousness of this group special needs from the dental side due to their physical inability to have appropriate oral hygiene, moreover, difficulties in getting enough dental care in the dental office were noticed [13] [14] [15], especially in severe impairments that need caregivers, parents or siblings for keeping of good oral health. But there is a shortage in the knowledge of oral health among caregivers. They also do not have appropriate oral hygiene practice [16]. Many of these less lucky individuals can't cope with the specific health needs [17].

On the other hand, there is an increase in the incidence of dental diseases among special needs individuals in the Gulf Area. Therefore, the evaluation of caregivers behavior toward periodontal and oral health is necessary due to its impact on periodontal and oral health keeping among these kinds of individuals [18] [19]. Most studies in Saudi Arabia conducted on the effect of oral health knowledge on the periodontal status among normal patients and few studies were on special needs patients.

Furthermore, there was no study focused on the oral health practice and oral health knowledge level of caregivers and its effect on periodontal status among special needs adults in Aseer Region. Therefore, the aim of the study was to evaluate the impact of oral health practice and knowledge level of caregivers on the periodontal status among special needs adults in Aseer Region Saudi Arabia. At the end of the current study, the results that were obtained may help caregivers to maintain the health of periodontal tissues, among these patients in special needs centers in Saudi Arabia.

2. Material & Methods

2.1. Study Design and Patient Selection

The current cross-sectional study was carried out on 180 special needs patients and on 180 caregivers who visited the Outpatients' Dental Clinics, College of Dentistry at King Khalid University in the period between January 2018 and January 2019. Special needs individuals were divided into three equal groups (n = 60 + 60 + 60), visual impairment group (I), moderate mental retardation group (II) and physical impairment group (III).

All participants in the current study (special needs individuals and caregivers) were males. The standard of the inclusion of the present study was their close working with the special needs individuals. It is difficult to assess the level of oral health practice and oral health knowledge of all special need individuals' caregivers in Aseer region, Saudi Arabia. And also to evaluate its impact on the periodontal status of special also need individuals. Consequently, the sample in the current study depended on a selection of participating individuals who came to the Outpatients' Dental Clinics, college of dentistry, King Khalid University in Abha city of Aseer region. In such way that they represent the caregivers and their special need individuals in Aseer region possible.

The Scientific Research Committee, College of Dentistry, King Khalid University reviewed and approved the proposal of the study and the ethical clearance certificate was obtained (SRC/ETH/2018-19/081). The consent for participants was obtained before starting the study. All ethical steps of this study design were applied according to the Ethical Standards of the Helsinki Statement 1975 reviewed in 2008.

2.2. Collection of Data and Clinical Examination

A questionnaire for the present study was designed for an interview of all the caregivers' participants to assess the oral health practice and knowledge level of caregivers. The questionnaire was prepared in different languages due to the fact that was foreigners. The questionnaire was comprised of caregivers' personal, general and occupational information. Moreover, two portions of information. Part (I): Questions about the caregivers' periodontal, oral health knowledge and awareness. Part II: Questions about the caregivers' periodontal and oral health practice (**Figure 1** and **Figure 2**).

The clinical examination of the assessment periodontal tissues as well as the oral hygiene status among special needs individuals was conducted by the authors as a second clinical step in the present study. Periodontal and oral health status of all the special needs individuals in the present study was evaluated by the assessment of; Plaque Index (PLI) [20], Gingival Index (GI) [21], Periodontal Pockets Depth (PPD), Gingival Recession (GR) and Clinical Attachment Loss (CAL). The assessment of (PLI) and(GI) was four sites around each tooth, whereas, the assessment of PPD, GR and CAL were six sites around each tooth to the next millimeter utilizing University of Michigan O probe with Williams markings (**Figures 3-5**).

Questionnaire Part I& II:

Caregivers' periodontal and oral health knowledge and awareness

No. Participant (Caregivers): ☐ File number: ☐☐☐☐☐☐

Study Group: First: ☐ Second: ☐ Third: ☐

Age: ☐ Gender: ☐

No	Questions	Choose only One Answer?	
1	How many teeth does adult individual have?	A-18.	
		B-28.	
		C-32.	
		D- I haven't any idea.	
2	Which of the following may help you to know the dental decay?	A-Small black cavity on the tooth surface.	
		B-Tooth bleeding.	
		C-Tooth pain.	
		D.I haven't any idea.	
3	Do you know what the discoloration in the neck of the tooth is?	A-Plaque.	
		B-Tartar.	
		C-Food debris.	
		D- I haven't any idea.	
4	What do bleeding gums indicate?	A-Normal Gum.	
		B-Infected Gums.	
		C-Pigmented Gums.	
		D-I haven't any idea.	
5	Which of the following is considered essential for causing gum diseases?	A- Age progression.	
		B-Sweet and sugar.	
		C-Bacterial deposit.	
		D- I haven't any idea.	
6	Which of the following may occur after gums diseases?	A-Gums abscess.	
		B-Missing teeth.	
		C-Headache.	
		D-I haven't any idea.	
7	Do you think, there is a correlation between systemic diseases and gum diseases?	A-Yes.	
		B-No.	
		C-I haven't any idea.	
8	What is the most important problem related to the gums and teeth of your patient?	A-Bleeding of gums.	
		B-Dental decay.	
		C-Movement of teeth.	
		D-I haven't any idea.	
9	Which of the following food most deleterious to teeth and gums?	A-Sweet.	
		B-Meat.	
		C-Fruits	
		D-I haven't any idea.	
10	What are the effects of tobacco smoking on the gums?	A- Mouth sensation.	
		B-Inflammation of gums.	
		C- Mouth cancer.	
		D-I haven't any idea.	

Figure 1. Questionnaire Part I & II: Caregivers periodontal and oral health knowledge and awareness.

2.3. Statistical Analysis

Data was collected and a comparison was done between the oral health practice and knowledge level of caregivers and periodontal status of special needs adults. Data was analyzed by using the SPSS Statistical Software (version 21.0, IBM SPSS Inc., Chicago, IL, USA). Percentages of the results and proportions were applied to explain the statistics. Analysis of variance (ANOVA) and utilized to assess the variations in the mean and standard deviation (±SD) of PLI, GI, PPD, GR and

Questionnaire Part I &III:

Caregivers' periodontal and oral healthpractice

No. Participant (Caregivers): ☐ File number: ☐☐☐☐☐☐

Study Group: First: ☐ Second: ☐ Third: ☐

Age: ☐ Gender: ☐

No.	Questions	Choose only One Answer	
1	What is the ideal method for teeth cleaning at home?	A-Tooth brushing.	
		B-Washing with water.	
		C- Cleaning with Miswak.	
		D-I haven't any idea.	
2	How many times per day the teeth should be cleaned?	A-One-time.	
		B-Two times.	
		C-After eating.	
		D-I haven't any idea.	
3	What Kind of dentifrices do you prefer?	A-Anti-Sensitive teeth dentifrices.	
		B-Teeth-whitening dentifrices.	
		C-Herbal dentifrices.	
		D-I haven't any idea.	
4	What is the ideal kind of tooth brush?	A-Soft.	
		B-Medium.	
		C-Hard.	
		D-I haven't any idea.	
5	Which of the following is the correct method of tooth brushing?	A-Horizontal.	
		B-Circular.	
		C- Horizontal with circular.	
		D-I haven't any idea.	
6	When the toothbrush should be changed?	A-After one month.	
		B-After 2 months.	
		C-After 3 months.	
		D-I haven't any idea.	
7	Which of the following should be used for cleaning the spaces between teeth?	A-The dental floss.	
		B-The toothpick.	
		C-Inter dental brush.	
		D-I haven't any idea.	
8	What is the suitable time to visit the dental clinic routinely	A-Once every 3 months.	
		B- Once every 6 months.	
		C-Once every year.	
		D-I haven't any idea	

Figure 2. Questionnaire Part I & III: Caregivers periodontal and oral health practice.

Figure 3. Periodontal status of disability patient within group I.

Figure 4. Periodontal status of disability patient within group II.

Figure 5. Periodontal status of disability patient within group III.

CAL. Chi-square test was applied to evaluate the relation between periodontal and oral hygiene status of patients. According to the types of disabilities and caregiver oral health practice, knowledge level and the adopted statistical significance differences (p-value) in the results of this study were ($p < 0.05$).

3. Results

Table 1 and Figure 6 display that the participants in the present study were 180 of special needs individuals and 180 caregivers within three different groups (n = 60 + 60 + 60). Special needs individuals had a range of age between 24 and 75 years. Whereas caregivers had a range of age between 25 and 55 years. Approximately, 29% of group I, 33% of group II and 32% of group III were in the early adulthood age. 38% of group I, 37% of group II and 45% of group III were in the moderate adulthood age. Furthermore, 33% of group I, 30% of group II and 23% of group III were in the later adulthood age.

On the other hand, Table 2 and Figure 7 summarize the distributions of group I, II and III caregivers within the range age 25 - 35 years, 36 - 45 years and 46 - 55 years. These findings within Table 2 and Figure 7 showed that 20% of group I, 28% of group II, 19% of group III were within the age range of 25 - 35 years. 45% of group I, 52% group II, and 48% of group III were within the range of age 36 - 45 years, moreover, 21% of group I, 20% of group II, and 33%

Table 1. Patients age range and distribution of special needs individuals.

DA‡	Groups			Total
	Group I	Group II	Group III	
EA*	17 (29%)	20 (33%)	19 (32%)	56 (31%)
MA	23 (38%)	22 (37%)	27 (45%)	72 (40%)
LA♀	20 (33%)	18 (30%)	14 (23%)	52 (29%)
Total	60 (100%)	60 (100%)	60 (100%)	180 (100%)
Chi-square	X^2		5.204	
	P-value		0.103	

‡Distributions of adults within group; *Early Adulthood (24 - 34 ys); **Moderate Adulthood; **(34 - 60 ys). ♀Later Adulthood (60 - 75 ys).

Table 2. Patients age range and distribution of health caregivers.

		Groups			Total
		Group I	Group II	Group III	
Range of age	25 - 35 ys	12 (20%)	17 (28%)	11 (19%)	40 (23%)
	36 - 45 ys	27 (45%)	31 (52%)	29 (48%)	87 (48%)
	46 - 55 ys	21 (35%)	12 (20%)	20 (33%)	53 (29%)
Total		60 (100%)	60 (100%)	60 (100%)	180 (100%)
Chi-square	X^2		4.725		
	P-value		0.146		

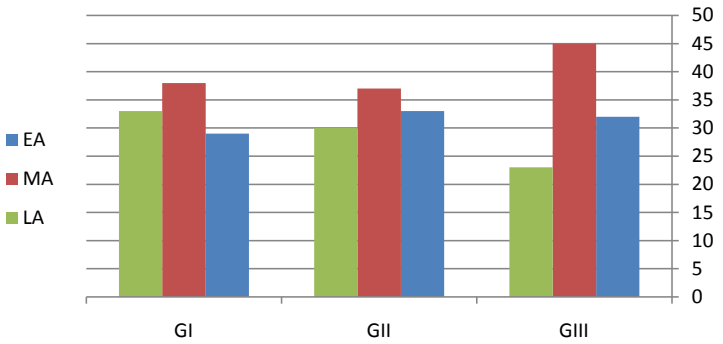

Figure 6. Patients age range and distribution of special needs individuals.

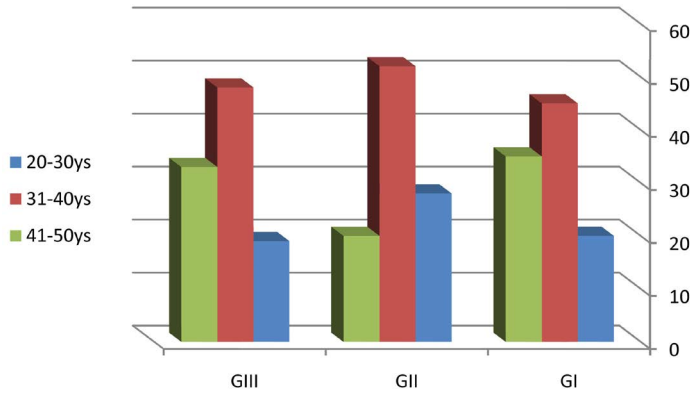

Figure 7. Patients age range and distribution of health caregivers.

of group III were within the range of age 46 - 55 years. Consequently and according to these results, there were 31%, 40% and 29% of special needs individuals within early Adulthood age. The moderate adulthood age, and the later adulthood age respectively, whereas, 23%, 48% and 29% of caregivers within the age range of 25 - 35 years 36 - 45 years and 46 - 55 years respectively.

Caregivers were interviewed to evaluate their periodontal and oral health knowledge and awareness (Table 3) and their periodontal and oral health practice (Table 4). That was according to the design of the current study and through the answers of questions in the questionnaire.

Table 3 shows that all caregivers in all groups chose the correct answers to the questions that evaluated the periodontal, oral health knowledge and awareness except the answer to question number six, where 51% and 59% of caregivers in group I and III chose the wrong answers to compare with 55% of them chose the correct answers in group II. Generally, there were good periodontal and oral health knowledge and awareness among caregivers, particularly in group II more than group III and group I and this knowledge among the caregivers in the group III was better than the knowledge among the caregivers in group I.

Table 4 demonstrates the answers of questions about the caregivers periodontal and oral health practice in group I, II and III respectively. Where it turns out 55% of group I, 68% of group II and 72% of group III reported that tooth brushing is the ideal method for teeth cleaning at home.

Tooth brushing should be two times daily according to the answers of 37% of group I, 32% of group II and 49% of group III compared to 48% of group I, 16% of group II and 16% of group III who reported that it should be after eating. Furthermore, the anti-sensitivity teeth dentifrices were the best toothpaste according to the answers of 69% of group I, 78% of group II and 70% of group III.

On the other hand, 55% of group I, 27% of group II and 52% of group III answered that the ideal brush is the soft toothbrushes compare with 37% group I, 57% of group II and 45% of group III who chose the answer of medium toothbrushes. In addition, 33%, 60% and 48% of caregivers demonstrated that the toothbrush should be changed every three months. Regarding the answers to oral hygiene measures in the questionnaire and when we asked caregivers about the right method of tooth brushing 38% of group I, 52% of group II and 55% of group III reported that the horizontal tooth brushing is the best method.

In the answers to the question about the methods of interdental spaces cleaning, 73% of group I, 77% of group II and 77% of group III answered that the using to dental floss is the effective method to clean the Interdental space. Regarding determine the suitable time of the dental clinic visit, there were 63% of group I, 72% of group II and 60% of group III answered that it should be every six months. Consequently, oral health practice among the caregivers of group II and group III was better than among the caregivers of group I.

Table 5 and Figure 8 reveal the mean and standard deviation of PLI, GI, PPD, GR and CAL of the patients in the present study groups. There were differences without statistical significance in all clinical parameters between group I, group

Table 3. Caregivers periodontal and oral health knowledge and awareness

N	Questions	Choose one answer	Frequency			%			P value
			GI	GII	GIII	GI	GII	GIII	
1	How many teeth does adult individual have?	A-18	0	0	0	0	0	0	0.0001*
		B-28	0	6	6	0	10	10	
		C-32	49	47	42	82	78	80	
		D-I haven't any idea	11	7	6	18	12	10	
2	Which of the following may help you to know the dental decay?	A-Small black cavity on the tooth surface	58	55	56	97	92	93	0.0001*
		B-Tooth bleeding	0	0	0	0	0	0	
		C-Tooth pain	2	5	4	3	8	7	
		D-I haven't any idea	0	0	0	0	0	0	
3	Do you know what the discoloration in the neck of the tooth is?	A-Plaque	49	52	51	82	87	85	0.0001*
		B-Tartar	0	0	3	0	0	5	
		C-Food debris	6	5	4	10	8	7	
		D-I haven't any idea	5	3	2	8	5	3	
4	What do bleeding gums indicate?	A-Normal Gum	0	0	0	0	0	0	0.0001*
		B-Infected Gums	52	58	56	87	97	93	
		C-Pigmented Gums	5	0	3	8	0	5	
		D-I haven't any idea	3	2	1	5	3	2	
5	Which of the following is considered essential for causing gum diseases?	A-Age progression	0	0	0	0	0	0	0.0001*
		B-Sweet and sugar	15	12	16	25	20	27	
		C-Bacterial deposit	41	48	44	68	80	73	
		D-I haven't any idea	4	0	0	7	0	0	
6	Which of the following may occur after gums diseases?	A-Gums abscess	31	22	35	51	36	59	0.0001*
		B-Missing teeth	21	33	20	35	55	33	
		C-Headache	4	1	0	7	2	0	
		D-I haven't any idea	4	4	5	7	7	8	
7	Do you think, there is a correlation between systemic diseases and gum diseases?	A-Yes	39	41	40	65	68	66	0.0001*
		B-No	14	6	7	23	10	12	
		C-I haven't any idea	7	13	13	12	22	22	
8	What is the most important problem related to the gums and teeth of your patient?	A-Bleeding of gums	29	22	20	48	36	33	0.00001*
		B-Dental decay	20	25	28	33	42	47	
		C-Movement of teeth	4	7	6	7	12	10	
		D-I haven't any idea	7	6	6	12	10	10	
9	Which of the following food most deleterious to teeth and gums?	A-Sweet	55	49	52	92	81	86	0.0001*
		B-Meat	0	7	4	0	12	7	
		C-Fruits	0	0	4	0	0	7	
		D-I haven't any idea	5	4	0	8	7	0	

Continued

10	What are the effects of tobacco smoking on the gums?	A-Mouth sensation	5	2	4	8	3	7	0.0001*
		B-Inflammation of gums	10	14	10	16	23	16	
		C-Mouth cancer	39	40	43	64	67	72	
		D-I haven't any idea	7	4	3	12	7	5	

Table 4. Caregivers periodontal and oral health practice.

N	questions	Choose one answer	Frequency			%		
			GI	GII	GIII	GI	GII	GIII
1	What is the ideal method for teeth cleaning at home?	A-Tooth brushing	33	41	43	55	68	72
		B-Washing with water	21	1	2	35	2	3
		C-Cleaning with Miswak	4	17	13	7	28	22
		D-I haven't any idea	2	1	2	3	2	3
2	How many times per day the teeth should be cleaned?	A-One-time	4	28	20	7	47	33
		B-Two times	22	19	29	37	32	49
		C-After eating	29	10	10	48	16	16
		D-I haven't any idea	5	3	1	8	5	2
3	What Kind of dentifrices do you prefer?	A-Anti-sensitivity dentifrices	41	47	42	69	78	70
		B-Teeth-whitening dentifrices	8	2	5	13	3	8
		C-Herbal dentifrices	3	4	5	5	7	8
		D-I haven't any idea	8	7	8	13	12	14
4	What is the ideal kind of toothbrush?	A-Soft	33	16	31	55	27	52
		B-Medium	22	34	27	37	57	45
		C-Hard	5	10	0	8	16	0
		D-I haven't any idea	0	0	2	0	0	3
5	Which of the following is the correct method of tooth brushing?	A-Horizontal	23	31	33	38	52	55
		B-Circular	14	16	16	23	26	26
		C- Horizontal with circular	16	12	7	27	20	12
		D-I haven't any idea	7	1	4	12	2	7
6	When the toothbrush should be changed?	A-After one month	16	13	13	27	22	22
		B-After 2 months	23	10	17	38	16	28
		C-After 3 months	20	36	29	33	60	48
		D-I haven't any idea	1	1	1	2	2	2
7	Which of the following should be used for cleaning the spaces between teeth?	A-The dental floss	44	46	46	73	77	77
		B-The toothpick	8	8	5	13	13	8
		C-Inter dental brush	7	5	8	12	8	13
		D-I haven't any idea	1	1	1	2	2	2
8	What is the suitable time to visit the dental clinic routinely	A-Once every 3 months	8	8	13	13	13	22
		B-Once every 6 months	38	43	36	63	72	60
		C-Once every year	13	8	10	22	13	16
		D-I haven't any idea	1	1	1	2	2	2

Table 5. Mean and standard deviation (±SD) of clinical findings.

	PLI[x]	GI[xx]	PPD[Φ]	GR[ΦΦ]	CAL[v]
Group I	1.3 ± 0.2	1.5 ± 0.7	4.5 ± 0.81	2.1 ± 0.33	6.6 ± 1.14
Group II	1.9 ± 0.7	1.7 ± 0.11	6.0 ± 1.5	2.7 ± 0.88	8.7 ± 2.38
Group III	2.0 ± 0.6	2.5 ± 1.6	5.5 ± 1.5	2.0 ± 0.25	7.5 ± 1.75
P-value	0.613	0.355	0.314	0.677	0.424

[x]Plaque index; [xx]Gingival index; [Φ]Periodontal pocket depth; [ΦΦ]Gingival recession; [v]Clinical attachment loss.

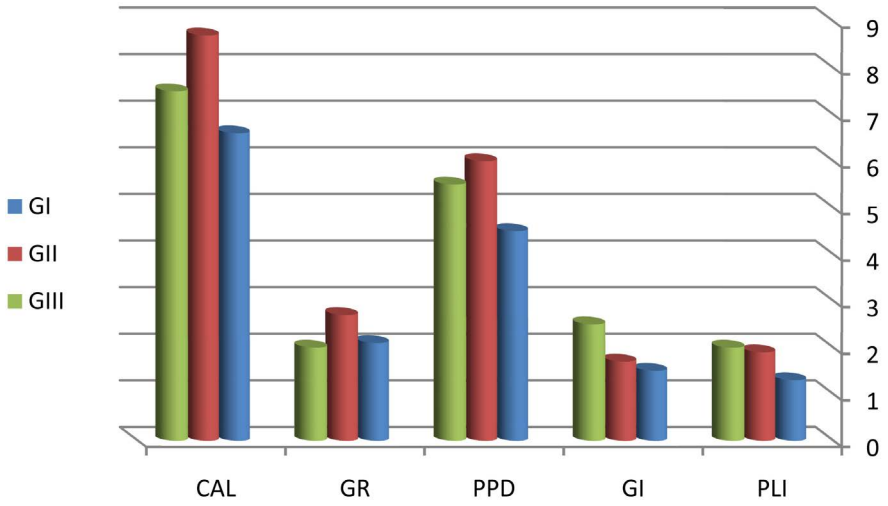

Figure 8. Mean and standard deviation (±SD) of clinical findings.

II group III ($p > 0.05$). The mean and standard deviation of PLI and GI of group III were more than group I and II whereas PPD, GR and CAL in group II were more than group I and group III.

Patients in group I and group III had a fair oral hygiene and Stage III generalized periodontitis moderate rate, whereas, moderate oral hygiene and Stage III generalized periodontitis severe rate were detected among the patients in group II. These clinical findings are not corresponding to the oral health knowledge and practice among caregivers of group I, group II and III where there was an increase in the level of oral health knowledge and practice among caregivers of group II and group III more than group I.

4. Discussions

The role of caregivers in the preservation of periodontal and oral health is very important. Consequently, regular oral health participates to the inhibition of periodontal disease, but there are difficulties for the individuals with special needs who cannot do regular oral health by themselves and depend on caregivers for help.

Special needs individuals were divided into two main groups: Congenital deficiencies group and acquired disorders group. The current study was designed to assess the effect of oral health practice and knowledge level of caregivers on pe-

riodontal status of some special needs adults in Aseer Region, Saudi Arabia. Several earlier studies revealed that there was sufficient knowledge of oral health among caregivers [22] [23], particularly in periodontal health knowledge [24].

In Saudi Arabia and depending on the knowledge of authors, there are no former studies displayed the relationship between the periodontal status of special needs individuals and the oral health Knowledge of their caregivers in Aseer Region. The findings of the present study displayed differences in periodontal status among special needs individuals according to the oral health knowledge and oral health practice among caregivers. These results are in agreement with the results of another study which demonstrated that good oral health could be accomplished for special needs individuals after caregivers' development of their oral health knowledge [25].

The findings of the present study revealed that the caregivers had a good knowledge about oral health (81.75%) more than their knowledge of periodontal health (67.5%), which is in agreement with the finding of another study which revealed that 75% of the caregivers reported that constant oral health is necessary to avoid the incidence of oral diseases [26]. However, the results of the present study displayed that oral health knowledge of caregivers and their periodontal health knowledge did not affect the periodontal status among special needs individuals.

In the present study 70.5% of caregivers in group I chose the correct answers of oral health and periodontal knowledge questions, compared to 74.7% of group II and 72.8% of group III. This shows that the caregivers of the special needs individuals in the current study had more awareness about the risk factors of oral and periodontal diseases.

In a previous study which has been done to evaluate the oral health knowledge of some caregivers, there were three from five of caregivers knew the effects of topical application of fluoride in preventing dental caries. Other previous studies confirmed the importance of caregiver's comprehension regarding the effect of fluoride in the protection of oral health [27] [28]. These results are consistent with the results of the current study where found that 69% of caregivers in group I, 78% of caregivers in group II and 70% of caregivers in group III answered that anti-sensitivity teeth dentifrices should be used.

It is noteworthy that caregivers in this study demonstrated acceptable knowledge of periodontal and oral health practice, where 37% of caregivers in group I, 32% of caregivers in group II and 49% of caregivers in group III answered that teeth should be brushed twice daily. In contrast with 48% of caregivers in group I, 16% of caregivers in group II and 16% of caregivers in group III relieved that it is best to brush teeth after every meal. Moreover, 7% of caregivers in group I, 47% of caregivers in group II and 33% of caregivers in group III answered that teeth should be brushed one time daily. These results are in agreement with a professional recommendation which revealed that tooth brushing should be twice daily with bass technique [29].

On the other hand, the results aren't in agreement with the findings of Niazi

et al. [30], who demonstrated that 50% of caregivers used Miswak as toothbrush, whereas, in the current study 55% in group I, 68% in group II and 72% in group III reported that toothbrush is more effective than Miswak. In addition, most of the participants in the present study answered that they changed their toothbrush every three months, which is corresponding with earlier studies exhibited that 65.5% of participants changed their toothbrush every three months [31].

Considering that the toothbrushes are vital tools in plaque controlling and keeping of periodontal health [32] [33]. The questionnaire in the present study included asking the caregivers about the kinds of toothbrushes. It showed that about 55%, 27% and, 52% of caregivers in group I, II and III respectively used soft toothbrushes. Compared to 37%, 57% and, 45% of caregivers in group I, II and II who respectively used medium toothbrushes. Moreover, 10% and 16% in group I and II used hard toothbrushes. Caregivers in the current study favored soft toothbrushes based on dental professionals' recommendation that is according to the answers of them [34].

Regarding the method of tooth brushing, the plurality of caregivers in the present study used horizontal tooth brushing technique. These results coincided with the results of Padilla *et al.* studies [35].

It should be noted that to preserve the health of periodontal tissues in interdental areas, many researchers recommend using dental floss [36]. According to the results of the present study, 73%, 77% and 77% of caregivers in group I, II and III respectively, reported that using the dental floss is the appropriate method to prevent the health of periodontal tissues in interdental areas.

Based on the results of the current study, there were ineffectual of oral health Knowledge and oral health practices of caregivers to decrease the formation of dental plaque and periodontal disease among special needs individuals in Aseer region. In previous epidemiological study, there was a relation between the level of dental plaque and oral hygiene in addition to the severity of periodontal disease [37].

According to the clinical findings of the present study, the oral hygiene is better and severity of periodontal diseases is less among the special needs individuals in group I compared to the special needs individuals in group II and group III.

In the present study, the oral hygiene was fair and the severity of periodontal disease was stage III generalized periodontitis moderate rate among the special needs individuals in group I and group III. Compared to moderate oral hygiene and severe stage III generalized periodontitis severe rate among the special needs individuals in group II [38] [39] [40].

These results are not in harmony with the oral health knowledge and practice among caregivers of group I, group II and III, where there was an increase in the level of oral health knowledge and practice among caregivers of group II more than group I and group III. That may be due to the mental retardation among the patients of group II compared to the patients of group I and III.

5. Limitations of the Study

The limitations in this study are that it was carried out on the special needs individuals who went through periodontal treatment in the outpatient Dental Clinics, College of Dentistry, King Khalid University in Abha city as a sample of special needs individuals in Aseer region. It is known that there are several centers of special needs individuals in Saudi Arabia. Moreover, this study included males of caregivers and special needs individuals only.

6. Conclusion

Although the limitations in the present study conclude that all caregivers didn't take practice in periodontal and oral care, and they educated periodontal oral health practice by other colleagues or by themselves. Periodontal and oral health knowledge of caregivers was satisfying, but the periodontal status was unsatisfying that most of the special needs adults in the current study affected by moderate to severe periodontitis. For improving oral health and periodontal status of special needs individuals, the dental education and oral hygiene practice should be given to caregivers.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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