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Primary Health Care doctors' knowledge, attitude and practice towards Oral Health Khartoum state, Sudan

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Abstract

Background: *Integration of oral health promotion into general health care has been highly recommended by the World Health Organization. Primary Health Care (PHC) doctors can promote and contribute to improved oral health care as part of their routine general health care. Their position provides a better chance to evaluate children at an early age and they are more likely to see poor patients.*

Objective: *To assess and determine the oral health care knowledge, attitude, and practices of medical practitioner towards oral health.*

Methods: *This is a cross-sectional study among primary health care doctors, who are working in governmental primary health care centers in Khartoum state, Sudan. A self-administered questionnaire was used. A total of 250 participants took a part in the study. Analysis for associations was done using Chi square, (P < 0.05).*

Results : *Two hundred fifty doctors were involved in the current study ,almost 52 % were male and 48% were female, Regarding Knowledge The current study revealed that the overall knowledge of the participants towards oral health care was adequate more than two third (68%) of the participant have moderate knowledge , The doctors' knowledge was markedly lower in the fluoride usage those who obtained correct answers was ranged from (22%-24%) The current study present doctors had generally positive attitudes toward oral health care (OHC) and they believed that they should be more knowledgeable in this field. Although, the study represented There was no significance association between attitude and overall knowledge. Regarding to practice there was positive significant association of oral health knowledge with practice p-value was (< 0.05) almost all the participants with high education level examine the patient with dental problem p-value was highly significant = (0.00),*

Conclusion: *doctors at PHCs showed limited knowledge regarding oral health cars. While attitude of health workers towards their role in integration of oral health care had no statistical significant association with provision of oral health services, positive attitude was linked with willingness to be trained in oral health and provide oral health care services.*

Recommendation: *There is a great need for planning of a continuous medical education (CME) program in primary care. Dental services have to be included in PHC principles in Sudan where medical and dental communities work in collaboration with each other for the better delivery of patient care.*

Keywords: *knowledge, attitude, oral heath, oral health care workers, Dentists.*

Abbreviations

PHC	Primary Health Care
OHC	Oral Health Care
CME	Continuous Medical Education
ODH	Oral Health Directorate
OHP	Oral Health Preventive Program
MOH	Ministry of Health
WHO	World Health Organization
WHA	World Health Assembly
EB	Executive Board
CPI	Community Periodontal Index
DMFT	Decayed, Missing, Filled and Treatment Need
SUNT	Sound Untreated Natural Teeth
EHR	Electronic Health Record
GP	General Practitioner
GPTPDs	General Practitioner Training Program Directors
OCs	Oral Cancers
FPs	Family Physicians
POHEK	Physician Oral Education in Kentucky
OHCE	Oral Health Care Education

Introduction

A brief insight into the global burden of chronic diseases clearly states that the epidemic of chronic diseases affecting the bulk of the population has been neglected and it can be said more for the oral diseases. Oral diseases are categorized as chronic non-communicable diseases. Analysis of current data suggests a majority of the population is affected by dental caries and severe periodontitis is found in 5-20% of the adult population in most countries including Sudan. Oral health is defined as one of the components of primary health care in Sudan. This would have gone a long way to improve oral health **[**Kaguru. 2013**]**.

In most developing countries little attention is given to the mouth and oral health. In Khartoum State, the Oral Health Directorate (OHD) has developed successful oral health preventive programs (OHP) that are being currently implemented. Such as school oral health program, program for special needs and oral health education program for pregnant women attending antenatal care, up to now there is no specific oral health care program focus on the integration with primary health care (PHC) doctors to promote and improve oral health care **[**Baseer et al., 2012**]**. During the past 20 years, there has been a reduction in the prevalence of dental caries and periodontal diseases among the population of industrialized countries. **[**Ahmad et al., 2013**]**.

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 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, the level of population education and number of health professionals **[**Yousif & Miskeen, 2009**]**.

Primary health care PHC is defined as provides the first point of contact in the health care system. and the main source of PHC is general practice. The aim of primary health care is to provide an easily accessible route to care, whatever the patient's problem. PHC is based on caring for people rather than specific diseases. Before health professionals are trained as oral health educators, there is a need to determine the status of their own oral health knowledge and behaviors **[**Baseer et al., 2012**]**.

Oral health has long been restricted to the health of teeth. Over the past several decades multiple studies and the scientific literature have shown that this simplification and restricted association is not accurate **[**Yousef. 2011**]** Oral health goes well beyond the health of teeth to include the entire oral and craniofacial well-being of a person **[**Petersen. 2007**]**. Oral health is threatened with many risk factors that lead to oral diseases such as unhealthy diet, tobacco use, harmful alcohol use, and poor oral

hygiene. Oral disease may result in an inability to perform functions of the craniofacial complex subsequently affect the quality of life, these effects include lowered esteem from the appearance, halitosis, disruption of feeding and speech. **[**Kaguru. 2013**]**.

Clinical and public health research has shown that a number of individuals, professional and community preventive measures are effective in preventing most oral diseases. However, advances in oral health science have not yet benefited the poor and disadvantaged populations worldwide. The major challenges of the future will be to translate knowledge and experiences in oral disease prevention and health promotion into action programs **[**Petersen. 2007**]**.

Primary preventive strategies for oral health are an essential public health priority and preventive interventions presumably might have reduced or eliminated the incidence of oral diseases and averted substantial interference with quality of life. By increasing their involvement in oral health prevention during patients visits, primary care doctors may be able to play an important role in improving the dental health of their patients who have difficulty obtaining access to professional dental care. However, it is unclear to what degree primary care doctors are knowledgeable about preventive oral health and the extent to which they may already be participating in prevention and assessment. It is important to know how Primary care doctors' value the promotion of oral health and whether they would be willing to take on additional activities aimed at its improvement **[**Lewis et al., 2000**]**.

Oral health was associated with self-reported wellbeing and quality of life as measured along functional, psychosocial, and economic dimension. For instance, impaired oral health, adversely affect diet, nutrition, sleep patterns, psychological status, social interaction, and school and work-related activities among some individuals. Studies also reported that oral and craniofacial conditions may have social functioning 25 effect on an individual, in the areas of limitation of verbal and nonverbal communication and social interaction **[**Langha. 2004**]**. Few studies have investigated the prevalence of dental caries among school children in the past decades in Sudan rendering it difficult to understand the status and pattern of oral health **[**Nurelhuda et al., 2009**]**.

A survey of oral health in a Sudanese population in Khartoum state aimed to assess the oral health status and risk factors for dental caries and periodontal disease among Sudanese adults' resident in Khartoum State. Because the information was not available to health policy planners in Sudan. The Result is Caries prevalence was high, with 87.7% of teeth examined having untreated decay. Periodontal disease increased in extent and severity with age. For 25.8% of adults, tooth wear was mild; 8.7% had moderate and 1%severe tooth wear. Multivariate analysis revealed that decay was less prevalent in older age groups but more prevalent in southern tribes and frequent problem-based

attenders; western tribes and people with dry mouths who presented with less than18 sound, untreated natural teeth (SUNT). Older age groups were more likely to present with tooth wear; increasing age and gender were associated with having periodontal pocketing ≥ 4 mm. Authors concluded that the prevalence of untreated caries and periodontal disease was high in this population (Sudanese in Khartoum state) **[**Khalifa et al., 2012**]**.

In PHC doctors establish early relationships with young children and their parents, and represents trustworthy source of prevention information from birth. In primary care clinics, medical officers meet children and their families regularly in child-health clinics, with excellent opportunities to promote oral health, also in adolescence, preventing unhealthy behavior such as use of tobacco and alcohol is linking oral health to medical care and prevention **[**Rabiei et al., 2012**]**.

Generally, PHC is considered mainly for medical visit and not for a dental visit. In order to reduce the burden of oral disease, efforts and skills of both PHC doctors and dentists will be required. In this new partnership, the role of the primary care provider and team is to assess and reduce risk, screen for signs of early oral disease. At least three advantages of Incorporating preventive oral health care in routine medical care offers can be obtained these are; it will expand access for most patient populations, particularly high-risk groups. PHC doctors have skills and tools for engaging patients and families in self-care practices. These can be used to help patients and families to develop oral health self-care practices, such as brushing, flossing, and healthy diet choices. Primary care doctors have expertise in care coordination, a skill essential for supporting referrals to dentistry. Primary care teams can help patients understand the importance of oral health in the context of their overall health and reinforce messages patients hear in the dental office **[**Hummel et al., 2015**]**

Oral health problems in Sudan are on the rise and their prevalence is increasing. This warrants an assessment of the integration process to determine the factors deterring this important process with an aim of recommending actions for improvement. So, this study aimed to determine factors associated with practices of PHC doctors towards integrating oral health into PHC in Khartoum state Sudan 2016; with an aim of recommending ways of improving integration.

Materials and Methods

Study design

A descriptive cross-sectional study

Study area

This study was conducted in governmental PHC centers in Khartoum state, Khartoum. The primary care provided by 228 centers in Omdurman 88 centers (Omdurman 24, Umbada 35 and Karari 29) in Khartoum 63 (Khartoum center 32 and Jabal Awlia 31) and in Khartoum Bahri 77 (Bahri 9 and Sharq Elnil 38). In Khartoum State there are 229 centers providing phi, where 88 centers in Omdurman, 77 in Khartoum Bahri and 63 in Khartoum.

The study population comprises all Sudanese medical doctors who are fully registered in Sudan medical council and currently working at PHC centers as staff of the Ministry of Health Khartoum State Sudan

Inclusion and Exclusion criteria: registered medical doctors who consent to participate in the study were included in the study. Those who decline to participate in the study were excluded.

Data collection tools and technique

A modified self-administered questionnaire (47) was used to collect data, The questionnaire was pretested in a group of primary care doctors, who were not part of the sample.

Study variables will include: Independent variables

Socio-demographics included the respondents' age, gender, their working profile (public only/public and private practice) and region.

Dependent variables

Knowledge on role in integration of oral health into primary health care. Attitude and practice on role in integration of oral health into primary health care.

Validity and reliability

The researcher was the only one who was involved in data collection and interviews, thereby ensuring standardization in the way the questions were asked and recorded.

Data analysis

before analyzing. The data, the candidate checked and validated each sheet of questionnaire. The statistical package of social science (SPSS) was used for data entry and analyses. Descriptive statistics was used to describe the socio-demographic factors. Overall and specific frequencies and percentages were obtained for all questions. The results were presented using the in tables, charts and graphs. Chi-square test was used to determine correlation between the scale variables of the sample. Variables will be demonstrated as frequency tables and charts. Raw data was coded and entered into the computer. Data cleaning and analysis was done using Statistical Package for Social Sciences (SPSS) version 20 computer packages. To assess knowledge, questions were marked, right answers scored 1, wrong answers or nonresponse was scored zero. Each person's score was calculated as sum of the gained marks. A p-value of 0.05 or less was set throughout the analysis to be accepted as statistical significance

Results

This result was addressed through a descriptive cross- sectional study, where A total of 250 primary care medical officers were enrolled in the study. pretested designed questionnaire was used for collecting the required data, then collected data were revised, classified, and interpreted.

The distribution of the participants according to the gender showed that almost 52% were male and 48% were female, more than half of the participant almost 56% were registrars, half 50% of the populations working in Omdurman followed by Khartoum and Bahri 28%, 22% respectively. 41.6% of the participants were found to have <5 years of experience, while 42% were have 5-10 years of experience, and only 16.4% have >10. Regarding to the working profile 88% of the participant working in public and private. Shown in table (1) below.

Characteristics	Frequency	Percent
Gender		
Male	129	51.6%
Female	121	48.4%
Level of education		
Bachelor	83	33.2%
Diploma	12	4.8%
Master	16	6.4%
Registrars	139	55.6%
Working Place		
Khartoum	70	28.0%
Bahri	55	22.0%
Omdurman	125	50.0%
Year of working experience		
<5	104	41.6%
5 -10	105	42.0%
>10	41	16.4%
Working Profile		
Public Only	30	12.0%
Public and Private practice	220	88.0%
Total	**250**	**100.0%**

Table 1: distribution of the study population according to their sociodemographic characteristics in Khartoum state 2016

Distribution of sample according to knowledge in oral education. Where correct answers in Using fluoride tooth paste is more important than the brushing technique for preventing caries were 69%, Using xylitol in form of gums or snack reduce the level of bacteria which cause decay 70%, Mouth rinsing with high amount of water after tooth brushing is effective in preventing decay 52%. Sixty percent of the participant agreed that the first signs of decay are white spots on teeth surface .and 94%

answer correctly that Frequency of sugar consumption has greater role in caries formation while 62% thought the best time to refer pregnant women for emergency dental procedure is in second trimester. and 70% believed that the main cause of periodontal disease is dental plaque.

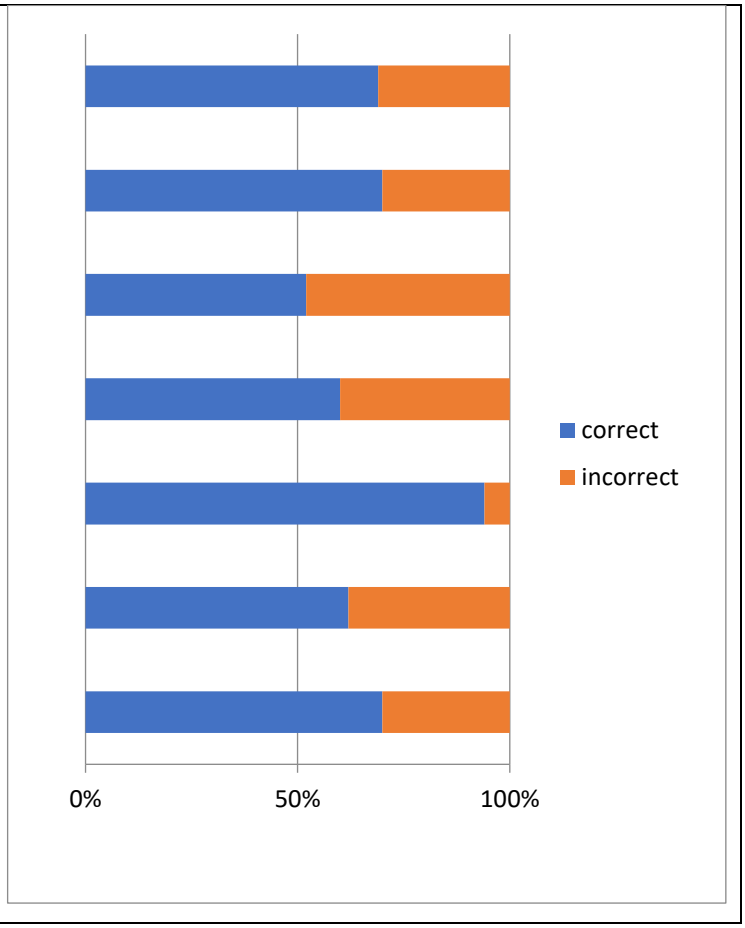
Using fluoride tooth paste is more important than the brushing technique for preventing cerise	
Using xylitol in form of gums or snack reduce the level of bacteria which cause decay	
Mouth rinsing with high amount of water after tooth brushing is effective in preventing decay	
the first signs of decay are white spots on teeth surface	
Frequency of sugar consumption has greater role in caries formation	
the best time to refer pregnant women for emergency dental procedure is in second trimester	
the main cause of periodontal disease is dental plaque	

Figure 1: Distribution of answers in oral education knowledge /Khartoum state / 2016

In oral screening answers varied from right to wrong but (88%) agreed that lesion in oral cavity remaining more than 2 weeks need biopsy. Also 88% think periodontal disease can cause cardiovascular disease, The number of physicians answering correctly was under 50% for two dentistry related medical questions out of seven. There was significant association between dentistry related medical knowledge of Primary care doctors and their age the p-value was significant = 0.002*, also there was significant association between overall knowledge of Primary care doctors and their level of education p-value was significant = 0.001*. The overall knowledge score was moderate 68% of the participants, there was significant association between overall knowledge of Primary care doctors and level of education P-value was significant = 0.008*. and there was nonsignificant association between overall knowledge and working experience, working profile, age and gender.

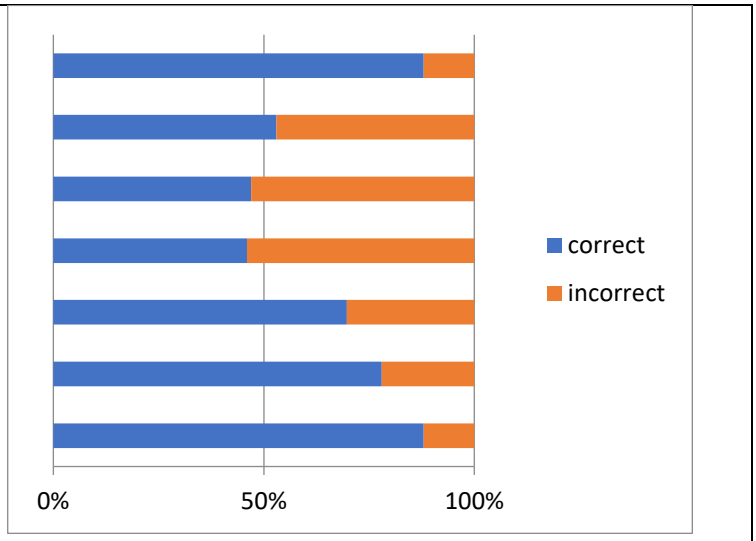
lesions in oral cavity remaining more than 2 weeks need biopsy	
chemotherapy increase the risk of dental caries	
radiotherapy increase the risk of dental caries	
Periodontal diseases can cause: 1/ low birth weight 2/ problems in diabetes control 3/ lung disease 4/cardiovascular disease	

Figure 2: Distribution of answers in dentistry related medical knowledge / Khartoum state 2016

	Poor n(%)	Moderate n(%)	Good n(%)	Total n(%)	P value
Age					
<35	74(29.6)	34(13.6)	64(25.6)	172(68.8)	0.002*
>35	42(16.8)	2(0.8)	34(13.6)	78(31.2)	
Gender					
Male	60(24.0)	15(6.0)	54(21.6)	129(51.6)	0.386
Female	56(22.4)	21(8.4)	44(17.6)	121(48.4)	
Education					
Bachelor	28(11.2)	20(8.0)	35(14.0)	83(33.2)	0.001*
Diploma	4(1.6)	4(1.6)	4(1.6)	12(4.8)	
Master	7(2.8)	4(1.6)	5(2.0)	16(6.4)	
registrars	77(30.8)	8(3.2)	54(21.6)	139(55.6)	
Experience					
<5	44(17.6)	18(7.2)	42(16.8)	104(41.6)	0.340
5 -10	49(19.6)	16(6.4)	40(16.0)	105(42.0)	
>10	23(9.2)	2(0.8)	16(6.4)	41(16.4)	
Working profile					
Public Only	17(6.8)	5(2.0)	8(3.2)	30(12.0)	0.323
Public & Private practice	99(39.6)	31(12.4)	90(36.0)	220(88.0)	
Total	116(46.4)	36(14.4)	98(39.2)	250(100.0)	

Table 2: Association between dentistry related medical knowledge and sociodemographic data / Khartoum state / 2016

	Poor n (%)	Moderate n (%)	Good n (%)	Total n (%)	P-value
Age					
<35	5 (2.0)	120 (48.0)	47 (18.8)	172 (68.8)	0.625
>35	2 (0.8)	50 (20.0)	26 (10.4)	78 (31.2)	
Gender					
Male	3 (1.2)	81 (32.4)	45 (18.0)	129 (51.6)	0.121
Female	4 (1.6)	89 (35.6)	28 (11.2)	121 (48.4)	
education					
Bachelor	0 (0.0)	61 (24.4)	22 (8.8)	83 (33.2)	
Diploma	2 (0.8)	6 (2.4)	4 (1.6)	12 (4.8)	0.008*
Master	1 (0.4)	14 (5.6)	1 (0.4)	16 (6.4)	
registrars	4 (1.6)	89 (35.6)	46 (18.4)	139 (55.6)	
Experience					
<5	4 (1.6)	69 (27.6)	31 (12.4)	104 (41.6)	
5 -10	1 (0.4)	71 (28.4)	33 (13.2)	105 (42.0)	0.580
>10	2 (0.8)	30 (12)	9 (3.6)	41 (16.4)	
Working profile					
Public Only	2 (0.8)	18 (7.2)	10 (4.0)	30 (12.0)	
Public and Private practice	5 (2.0)	152 (60.8)	63 (25.2)	220 (88.0)	0.310
Total N (%)	7 (2.8)	170 (68.0)	73 (29.2)	250 (100.0)	

Table 3: Association between knowledge scores of the doctors in oral health care according to sociodemographic background Khartoum state / 2016

Most of the participant (90%) believed that Primary care medical officers have important role in oral health promotion in the community, (75%) of them think Primary care medical officers have not enough information about oral health, while (72%) agreed that Primary care medical officers need to obtain further information on oral health.

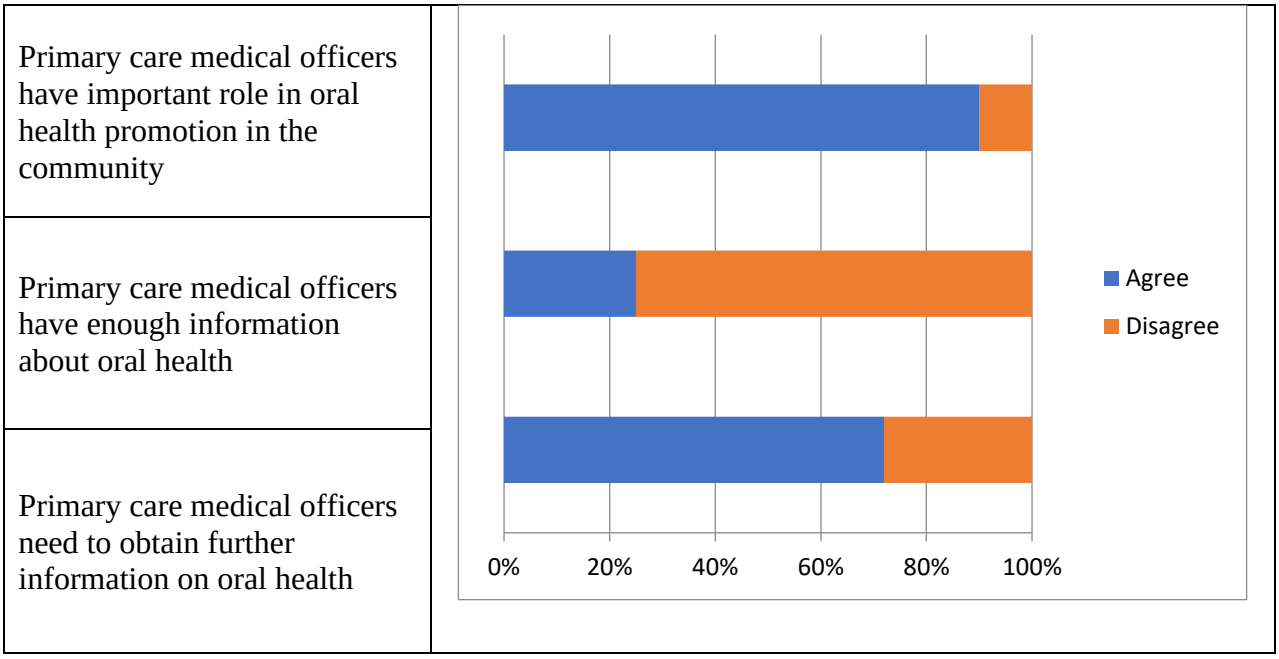


Figure (3): The distribution of answers according to the Attitude / Khartoum state / 2016

Here was nonsignificant association between participants overall knowledge and their attitude. The majority practice preventive measure and oral education from always to some times, 65% performed dental education, 52% practicing it sometimes, and 12% always revealed in figure (4). Significant number of the participants 66% give dental advice 10% always, while 56% practicing it sometimes shown in figure (5). The majority of the participants 89% examine the patients when they complained from dental problems from always 22% to sometimes 67%. Figure (6)

In figure (7) almost all of the participants 93% perform diet counselling from sometimes 57% to always 36%. Almost three quarter of doctors 73% refer the patients when they mention oral problems from always 20% to sometimes 53%. Figure (8).

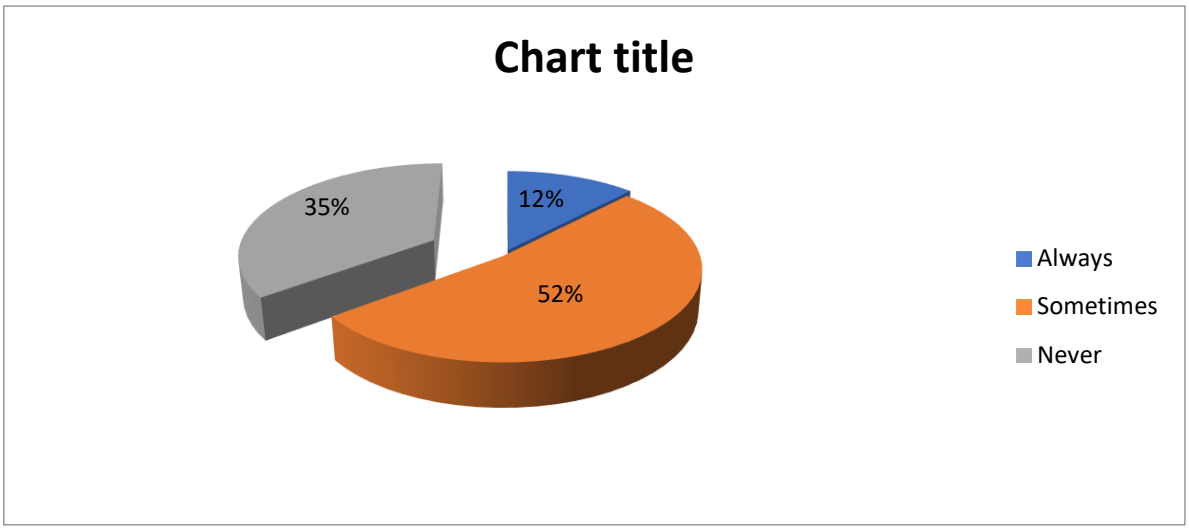


Figure 4: Distribution of answers according to performing dental education

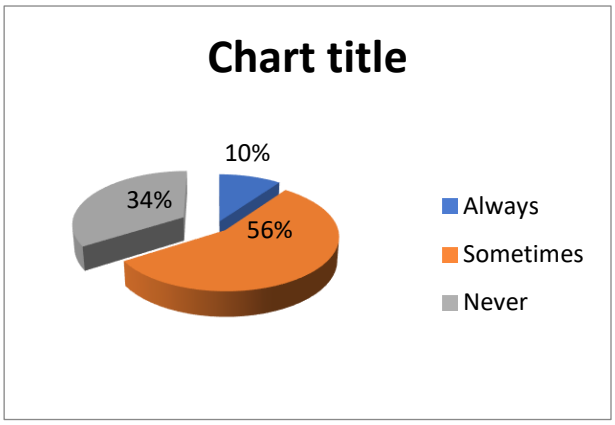


Figure 5: Distribution of answers according to giving dental advice

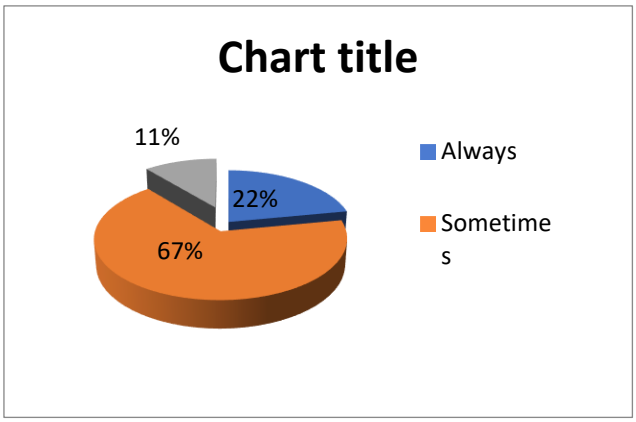


Figure 6: Distribution of answers according to patient examination

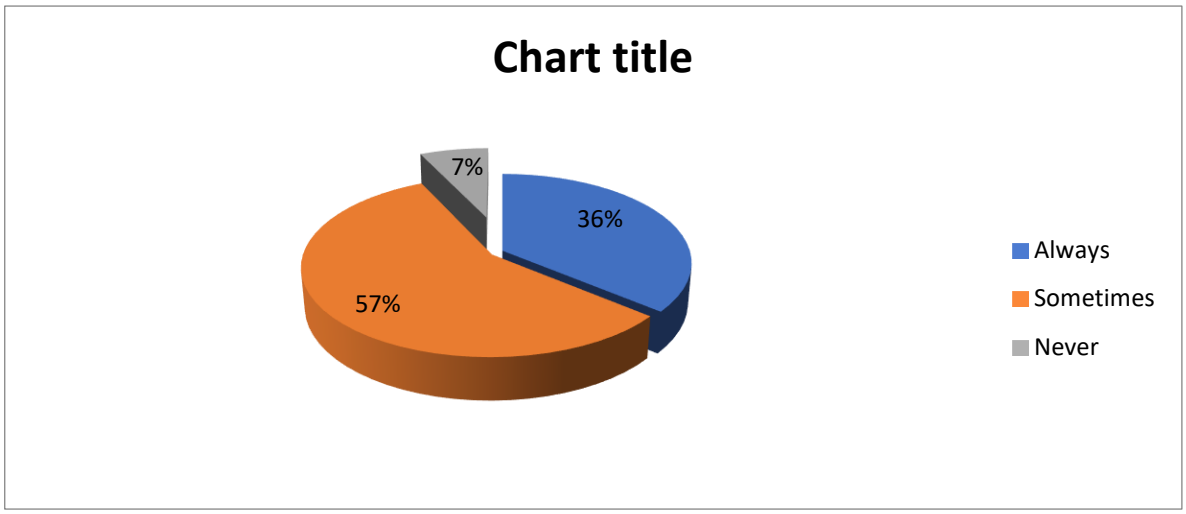


Figure 7: Distribution of answers according to give diet counseling

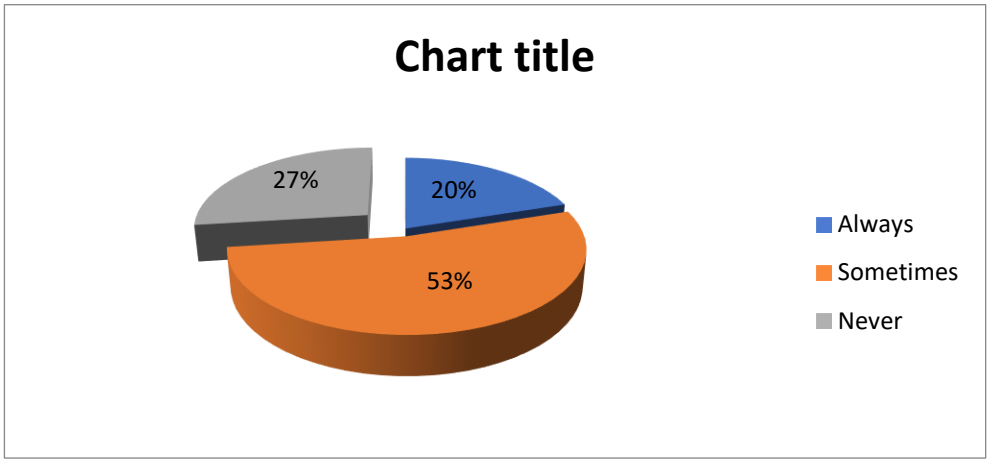


Figure 8: Distribution of answers according to referring the patients when they mentioned oral problems

There was significant association; between performing dental educations and oral health overall knowledge, p-value was significant = 0.023 also There was significant association between giving dental advice and oral health knowledge p-value was significant = 0.018 additionally there was significant association between examine patients with dental problems and overall knowledge p-value was significant = 0.004, (p- value< 0.05) .

		Poor n(%)	Moderate n(%)	Good n(%)	Total n(%)	P value
I perform dental education	Always	1 (0.4)	17(6.8)	13 (5.2)	31(12.4)	0.023*
	Sometimes	6 (2.4)	83 (33.2)	42 (16.8)	131 (52.4)	
	Never	0 (0.0)	70 (28.0)	18 (7.2)	88 (35.2)	
I give dental advice	Always	0 (0.0)	13 (5.2)	12 (4.8)	25 (10.0)	0.018*
	Sometimes	6 (2.4)	90 (36.0)	45 (18.0)	141(56.4)	
	Never	1 (0.4)	67 (26.8)	16 (6.4)	84 (33.6)	
I examine patients with dental problems	Always	2 (0.8)	33 (13.2)	21 (8.4)	56 (22.4)	0.004*
	Sometimes	2 (0.8)	115 (46.0)	50 (20.0)	167(66.8)	
	Never	3 (1.2)	22 (8.8)	2 (0.8)	27 (10.8)	
I give diet counseling	Always	4 (1.6)	54 (21.6)	32 (12.8)	90 (36.0)	0.124
	Sometimes	2 (0.8)	102 (40.8)	39(15.6)	143(57.2)	
	Never	1 (0.4)	14 (5.6)	2 (0.8)	17 (6.8)	
I refer the patients when they mention oral problems	Always	1 (0.4)	37 (14.8)	12 (4.8)	50 (20.0)	0.522
	Sometimes	4 (1.6)	84 (33.6)	45 (18.0)	133 (53.2)	
	Never	2 (0.8)	49 (19.6)	16 (6.4)	67 (26.8)	
Total		7 (2.8)	170 (68.0)	73 (29.2)	250 (100.0)	

Table 4: Association between doctors' overall knowledge and their practice

There was significant association between level of education and examine patients with dental problems, give diet counseling and refer the patients when they mention oral problems p-value was significant = (0.000), (0.005), (0.001) respectively. Table (5). There was significant association between work profile and examine patient with dental problems p-value = (0.009). Table (6).

There was no significant association between doctors who were perform dental education and their attitude towards that Primary care doctors have important role in oral promotion in the community p-value was nonsignificant = 0.236

There was significant association between doctors who are examine patient with dental problems and their attitude that Primary care doctors have an important role in oral promotion in the community. Table (8)

	Education	Always n(%)	Sometimes n(%)	Never n(%)	Total n(%)	P value
I examine patients with dental problems	Bachelor	13 (5.2)	59 (23.6)	11 (4.4)	83 (33.2)	0.000*
	Diploma	4 (1.6)	2 (0.8)	6 (2.4)	12 (4.8)	
	Master	5 (2.0)	7 (2.8)	4 (1.6)	16 (6.4)	
	registrars	34 (13.6)	99 (39.6)	6 (2.4)	139 (55.6)	
	Total	56 (22.4)	167 (66.8)	27 (10.8)	250 (100.0)	
I give diet counseling	Bachelor	22 (8.8)	54 (21.6)	7 (2.8)	83 (33.2)	0.005*
	Diploma	7 (2.8)	2 (0.8)	3 (1.2)	12 (4.8)	
	Master	9 (3.6)	6 (2.4)	1(0.4)	16 (6.4)	
	registrars	52 (20.8)	81 (32.4)	6 (2.4)	139 (55.6)	
	Total	90 (36.0)	143 (57.2)	17 (6.8)	250 (100.0)	
I refer the patients when they mention oral problems	Bachelor	27 (10.8)	42(16.8)	14(5.6)	83 (33.2)	0.001*
	Diploma	4 (1.6)	8 (3.2)	0 (0.0)	12 (4.8)	
	Master	3 (1.2)	9 (3.6)	4 (1.6)	16 (6.4)	
	registrars	16 (6.4)	74 (29.6)	49 (19.6)	139 (55.6)	
Total		50 (20.0)	133 (53.2)	67 (26.8)		

Table 5: Association between practice and socio demographic characteristics (level of education)

	Work profile	Always n(%)	Sometimes n (%)	Never n (%)	Total n (%)	P value
I examine patient with dental problems	Public only	13 (5.2)	16 (6.4)	1 (0.4)	30 (12.0)	**0.009***
	Public and private	43 (17.2)	151 (60.4)	26 (10.4)	220 (88.0)	
	Total	**56 (22.4)**	**167 (66.8)**	**27 (10.8)**	**250(100.0)**	

Table 6: Association between work profile and examine patient with dental problems

		I perform dental education			Total n(%)	P value
		Always n (%)	Sometimes n(%)	Never n(%)		
Primary care doctors have important role in oral promotion in the community	Agree	29 (11.6)	120 (48.0)	75 (30.0)	224(89.6)	**0.236**
	Disagree	2 (0.8)	11 (4.4)	13 (5.2)	26 (10.4)	
	Total	**31 (12.4)**	**131 (52.4)**	**88 (35.2)**	**250 (100.0)**	

Table 7: Association between practice and attitude

		I examine patient with dental problems			Total n(%)	P value
		Always n(%)	Sometimes n(%)	Never n(%)		
Primary care doctors have an important role in oral promotion in the community	Agree	54 (21.6)	149 (59.6)	21 (8.4)	224 (89.6)	**0.032***
	Disagree	2 (0.8)	18 (7.2)	6 (2.4)	26 (10.4)	
	Total	**56 (22.4)**	**167 (66.8)**	**27 (10.8)**	**250 (100.0)**	

Table 8: Association between practice and attitude

Also, there was significance association between doctors who were performing dental education and their attitude to Primary care doctors have enough information about oral health p-value was significant = 0.002. Table (9).

Likewise, there was significance association between doctors who were give dental advice and their attitude on that Primary care doctors have enough information about oral health p- value was significant = 0.017. Table (10)

There was significance association between doctors who were examine patient with dental problems and their attitude towards that Primary care physician have enough information about oral health p-value was significant = 0.008. Table (11)

		I perform dental education			Total n (%)	P value
		Always n (%)	Sometimes n (%)	Never n (%)		
Primary care doctors have enough information about oral health	Agree	14 (5.6)	36 (14.4)	13 (5.2)	63 (25.2)	**0.002***
	Disagree	17 (6.8)	95 (38.0)	75 (30.0)	187 (74.8)	
	Total	**31 (12.4)**	**131 (52.4)**	**88 (35.2)**	**250 (100.0)**	

Table 9: Association between practice and attitude

		I give dental advice			Total n (%)	P value
		Always n (%)	Sometimes n (%)	Never n (%)		
Primary care doctors have enough information about oral health	Agree	11 (4.4)	38 (15.2)	14 (5.6)	63 (25.2)	**0.017***
	Disagree	14 (5.6)	103 (41.2)	70 (28.0)	187 (74.8)	
	Total	**25 (10.0)**	**141 (56.4)**	**84 (33.6)**	**250 (100.0)**	

Table 10: Association between practice and attitude

		I examine patient with dental problems			Total n (%)	P value
		Always n (%)	Sometimes n (%)	Never n (%)		
Primary care physician has enough information about oral health	Agree	23 (9.2)	34 (13.6)	6 (2.4)	63 (25.2)	**0.008***
	Disagree	33 (13.2)	133 (53.2)	21 (8.4)	187 (74.8)	
	Total	**56 (22.4)**	**167 (66.8)**	**27 (10.8)**	**250 (100.0)**	

Table 11: Association between practice and attitude

Discussion

The PHC is considered an opportune site to reach large numbers of patients who make a medical visit but not a dental visit. Physicians can provide screening services for early detection of dental disease, provide advice about the need to seek dental care, and refer those in need.

About 250 doctors were involved in the current study, almost 52 % were male and 48% were female, (41.6%) of the participants were found to have less than 5 years of experience and (42%) were found to have an experience average of (5-10) years. Registrars were shown to be dominant among the study population representing (55.6%) of the total number of the participants. About (88%) of the participants were work in both public and private sectors. compared to a study which conducted in Tehran the percent is slightly higher. The number of the participants in this study was considered favorable since it reaches the required sample size, compared with other related studies it is almost similar to a study in Tehran (241 participants) **[**Rabiei S et al., 2012**]**, and also similar to a study which done in Kenya and the participants number was (201). Regarding age association with knowledge there was no difference observed between the older doctors and their younger colleagues' counterparts in relation to adequate knowledge on oral health education. This is similar to a study conducted in Kenya **[**Kagura. 2013**]**and differ from but the both results were contrast with (Rabiei et al) from Iran who reported that older physicians' dental knowledge was found to be higher than that of their younger colleagues **[**Rabiei S et al., 2012**]**. This could be as a result of changing curricular or different approach in teaching techniques.

Regarding knowledge and working profile the result showed that, there was no significant association between knowledge among doctors working in both public and private sector and their colleagues who were working in the public sector only, p-value was nonsignificant, this is contrast with a study which showed that Iranian physicians who were working in both public and private sectors had significantly better knowledge than did their colleagues working solely in the public sector. This may be due to that newly graduated physician in Tehran usually work in the public sector only, and doctors who are working in both sectors are become more experienced and knowledgeable.

Regarding knowledge and qualifications in the current study there was significant association between overall knowledge of Primary care doctors and their level of education p-value was significant = 0.001*, This is comparable to the finding obtained in Kenya the author concluded that Kenyan physician who had higher level of education had better knowledge **[**Kagura. 2013**]**

The present study revealed that the overall knowledge of the participants towards oral health care was adequate more than two third (68%) of the participant have moderate knowledge, while only (29%)

of the respondents attained the score of good knowledge and this is encouraging since adequate knowledge has been associated with greater comfort and confidence in dealing with oral health conditions , Generally the knowledge of PHCdoctors in Khartoum State regarding pediatric domain was more than (60%) , This result was clearly higher than Iranian study in which the physicians knowledge in pediatric domain was significantly low, where the 40% of physician answering correctly **[**Rabiei et al., 2012**]**. The doctors' knowledge was markedly lower in the fluoride usage those who obtained correct answers was ranged from (22%-24%), replicating the study done by Charlotte et al also indicate poor knowledge on fluoride application among American family physicians **[**Charlotte at al., 2009**]**.

The current results showed significant association between knowledge and oral screening This is in agreement with the finding of a study in Kenya which showed a positive association between knowledge and oral health practices by non-oral health care workers Similarly Rabiei et al, reported that those with higher scores in knowledge were more likely to offer oral health services compared to those who have inadequate knowledge **[**Rabiei S et al., 2012**]**.

Despite having adequate knowledge on their roles, very few of the respondents carried out screening on all their patients. Majority of the respondents still cited lack of knowledge as the major barrier to dental screening. In a similar study, Hajizamani et al., 2012 and Kaguru. 2013 authors found that good knowledge on their role does not always translate into good oral health practices. This could be as a result of lack of hands-on training in addition to the theoretical teaching.

The current study present doctors had generally positive attitudes toward oral health care (OHC) and they believed that they should be more knowledgeable in this field. (90%) of the participants agreed that Primary care doctors have an important role in oral health promotion in the community, In a similar study, in 2012 found that 90% of Iranian healthcare workers had adequate knowledge on their job description in integration of oral health into primary health care, **[**Hajizamani A t al., 2012**]** this is comparable to the findings of the current study, The result also was in the range when it was compared to the findings of Karyoki study the author found that health workers in Kenya had a general positive attitude towards their role in oral health care almost all of the respondents had a positive attitude towards oral health with 99.1% agreeing that oral health is important to general health. Also, the current study was in line with a study in which 80% of the participants were willing to perform oral health-promotion activities. **[**Prakash et al., 2006**]** in which Canadian physicians considered their role as "very important" in promoting oral health of children, another study indicated, however, that although American PHC doctors believed that they play an important role in promoting oral health,

they are not confident about becoming involved in this field [Lewis et al., 2000]. This shows how important it is for primary care doctors to have sufficient knowledge before acting and how their attitudes may be influenced by knowledge improvement , There was no significance association between attitude and overall knowledge in the current study, This in contrast to Yousef conclusion on his study among physicians in Iowa and Riyadh , the author found that increasing knowledge and experience could lead to better attitude and practices among non-oral health workers [Yousef. 2011]. Related to this, Karyoki study also found that some of the health workers had negative attitude towards dental screening and were skeptical of patients' acceptance of their oral health services The variation may be due to the variability in the homogeneity of the study sample of that study which including nurse and physician from different disciplines [Kaguru. 2013].

Regarding to practice there was positive significant association of oral health knowledge with practice, there was statistically significant association; between performing dental educations and oral health overall knowledge, p-value was significant (< 0.05). Also, there was statistically significant association between giving dental advice and oral health knowledge p-value was (< 0.05) additionally there was significant association between examine patients with dental problems and overall knowledge p-value was (0.004), (p- value< 0.05). This is in agreement with the finding of Abolghasem study in which showed a positive association between knowledge and oral health practices by Iranian non-oral health care workers [Hajizamani et al., 2012]. Similarly, Rabiei et al, reported that those with higher scores in knowledge were more likely to offer oral health services compared to those who have in adequate knowledge [Rabiei et al., 2012].

Generally, literatures have linked knowledge with practice and therefore any factor that affects knowledge will eventually affect the practice.

A large percentage (73%) of respondents said they referred their patients when they mentioned oral problem. This is similar to a study conducted in America [Rozier et al., 2003]. were 78% of primary clinician who participate in the survey reported that they were likely to refer children who had signs of early decay or high risk for future disease to the dentist and it is slightly different to the findings of Dela Cruz et al, 2004, who reported 90% of the physicians in the United States of America referring dental patients who they came across [Dela Cruz et al, 2004].

While the high rate of referral among the physicians was associated with monetary gain, the higher referral rates in this study could be as a result of generalized referral without any specific guidelines. Another barrier cited by the health workers was lack of experience. This is in line with Yousef conclusion on his study among physicians in Riyadh that increasing knowledge and experience could

lead to better attitude and practices among non-oral health workers. This represents a clear opportunity to provide practical dental training to improve confidence which will ultimately lead to good oral health practices. There was statistical significant association between level of education and practice items almost all the participants with high education level examine the patient with dental problem p-value was highly significant = (0.00) ,also there was statistical significant association between providing diet counseling and level of education p-value = (0.005) ,moreover there was association between higher level of education and referring patients when they mention oral problems p-value = (0.001) . Regarding working profile there was statistically significant association between examine patients with dental problems and working profile p-value was (0.009), this is duplicated Yousef study, who reported that Overall doctors were very receptive to the idea of taking on certain oral health care practices, especially related to risk assessments and prevention practices as part of their daily roles **[**Yousef. 2011**]**

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