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Original Article

Dentistry Section

Willingness and Perception of Dental Interns towards Working in Rural Areas in Riyadh, Saudi Arabia- A Cross-sectional Study

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ABSTRACT

Introduction: The shortage of dental workforces in rural areas is a major concern in Saudi Arabia, which affects the delivery of oral health care services. Although there is an improvement in the dentist to population ratio, there still a wide disparity in dentist to population ratio in rural and urban areas.

Aim: To assess the perception of dental interns to work in rural areas in Riyadh, Saudi Arabia and to know their willingness to serve rural population and factors associated with their decision.

Materials and Methods: A cross-sectional study was conducted among 400 dental interns from 6 dental colleges located in Riyadh, Saudi Arabia over a period of October to December 2019. Data was collected using a self-administered structured close ended questionnaire. Chi-square test and multiple logistic regression analysis were applied to measure the association of age, gender and marital status on their responses. A p-value <0.05 was considered as statistically significant.

Results: Out of 400 participants, 58% were willing to work in rural areas. Close proximity to hometown, in need for a job, rural placement program, fees and loan forgiveness and having rural background were the most favouring factors for working in rural area, whereas unfavourable working condition, lack of transportation facilities, poor accommodation, less scope for professional development and lack of necessary infrastructure were the main factors for reluctance. The male participants, Saudi nationals, rural residents, and the one whose fathers are less educated, were more likely to work in rural areas.

Conclusion: Based on the findings of the study a comprehensive human resource strategy be designed by health or medical educators in order to encourage dental students to take up jobs in rural areas.

Keywords: Interns career preference, Rural areas, Rural placement, Rural saudi arabia, Rural service

INTRODUCTION

Saudi Arabia is one of the main countries in the Middle East, with population count rising from 19.9 in 1999 to over 34 million in 2019 [1]. With the increase in population ratio, around 20% of the population lives in rural areas. With 28 dental colleges, approximately 1500 dental students get graduated yearly [2]. Although there are large number of dentists in Saudi Arabia, most of them prefer to work in urban areas. A study reported that over 80% of the Saudi dentists are working in the regions of Riyadh, Makkah and Eastern province [3]. In Riyadh, the dentist to population ratio is 1: 1536 which is above the recommended ratio by the WHO [4,5]. There is a wide discrepancy of distribution of the dental workforce between urban and rural areas, despite the fact that there is equal caries risk in rural and urban areas of Saudi Arabia [6]. However, the oral disease burden could worsen in the rural areas because of the unequal distribution of the dental health workforce. This geographical unequal distribution of the dentist–population proportion influences the accessibility to oral health care services, which lead to shortage of dental workforces in rural areas, presenting a challenging problem in the planning and quality of health care delivery in those areas [7]. The dental course curriculums in Saudi Arabia do have any form of rural service activities or postings for the dental students. The present study was taken-up with a null hypothesis stating that the dental interns in Riyadh are not willing to work in rural areas and with a research hypothesis stating that the dental interns in Riyadh are willing to work in rural areas. Hence, the aim of this study was to assess the willingness and perception of dental interns towards working in rural areas in Riyadh, Saudi Arabia and to determine the factors that influence their decision for working or not in rural areas and to determine whether age, gender, and marital status had an impact on their opinions to work in rural areas.

MATERIALS AND METHODS

A cross-sectional analytical study was conducted among dental interns to assess their willingness and perception towards working in rural areas in Riyadh, Saudi Arabia. The study was scheduled over a period of three months (October- December 2019). Before the start of the study, the Ethical Clearance was obtained from the Institutional Review Board (Ref. No. IRBC/2103/19, IRB NCBE Reg. No: H-01-R-005). The sample size was estimated with power of 80% and 95% confidence interval for prevalence of 50%. Thus, the sample size required for this study was 400 dental interns from both genders. There are 7 dental colleges in Riyadh out of which 6 of them were randomly selected for this study using lottery method. Convenience sampling technique was used for selecting the subjects for the study, considering the selection criteria to meet the sample size of 400. The dental interns willing to participate were included in this study and those not willing were excluded. A written informed consent was obtained from the willing participants.

The data was collected from the participants in their respective colleges after seeking the permission from the institutions, using a self-administered structured close-ended questionnaire. The questionnaire was designed after referring similar studies reported in the literature [7-15]. The questionnaire consisted of

three sections, the demographic data (question number 1-8), willingness to work (question number 9), reasons for willingness to work in rural areas (question number 10-19) and perceived barriers to work in rural areas (question number 20-29). Content validity and reliability of the questionnaire were assessed by the panel of experts, which was made-up of the faculty members of the institution. The main purpose was to determine the questions that had a greater degree of agreement amongst panel experts and to quantify the concordance between the panel experts for each question Aiken's V test was employed. A value higher that 0.92 were obtained for the questions included in this questionnaire [16]. The feasibility of the questionnaire was assessed by conducting a pilot study among the interns in our college. The questionnaire used in the pilot study comprised all the 29 questions that were used in the final version of the questionnaire. The participants of the pilot study comprised of 5% of the study population and their responses were included in the final data analysis.

STATISTICAL ANALYSIS

The data was entered and analysed using SPSS version 23 (IBM Corporation, Armonk, NY, USA). Since all variables described in attached questionnaire are categorical variables, data was summarised as proportions. Chi-square test and Fisher-exact test were used to compare sociodemographic data (age, gender, marital status, nationality, monthly family income, family residence, father's level of education, mother's level of education) across the two comparison groups (those preferring and not preferring to work in rural areas). Univariate and multivariate logistic regression analysis was used to identify variables associated with reference to work in rural areas. Variables found significant in univariate analysis were included in the final multivariate model. All tests were two-sided and a $p \leq 0.05$ was considered as statistically significant.

RESULTS

A total of 400 filled questionnaires were analysed, the response rate was 100%. A 57.5% (230) of the participants were male while 42.5% (170) were female. A total of 58% (232) of the participants were willing to work in rural areas while 42% (168) were not [Table/Fig-1]. Majority of the participants 93.3% (373) were between 23-25 years of age. An 87% (348) of the participants were Saudi nationals whereas 13% (52) were non-Saudi. The majority 82.3% (329) of the participants were unmarried while 17.8% (71) were married. A 79% (316) have a family residence in an urban origin while 21% (84) were residing in a rural area. A 69.8% (279) of the participants have a family income of 20,000 SAR and more followed by 10,000-19,000 SAR 24.8% (99) and the least 5.5% (22) were less than 10,000 SAR. Participants with a father education of bachelor degree were in majority 46% (184) followed by above bachelor degree 22.5% (90), high school 20% (80), and the least 11.6% (46) represented intermediate school, primary school, and illiterate. Participants with a mother education of bachelor degree were also the majority 44.5% (178) followed by high school 28.5% (114), above bachelor degree 12.3% (49), and the least 14.8% (59) represented intermediate school, primary school, and illiterate.

Favouring factors for working rural areas

The most favouring factors for working in rural areas were close proximity to hometown 297 (74.30%), in need for a job 289 (72.30%), rural placement program 277 (69.30%), fees and loan forgiveness 269 (67.30%), having a rural background 260 (65%), to serve the under-served community 258 (64.50%), less competition 212 (53%), friendly environment 199 (49.80%), broader clinical exposure 196 (49%) and higher job security 180 (45%).

Parametres	Distribution	Frequency (n)/Percentage (%)
Age (years)	23-25	373 (93.3)
	26 or above	27 (6.7)
Gender	Male	230 (57.5)
	Female	170 (42.5)
Nationality	Saudi	348 (87)
	Non-Saudi	52 (13)
Marital status	Married	71 (17.8)
	Unmarried	329 (82.2)
Family residence	Rural	84 (21)
	Urban	316 (79)
Monthly family income (SAR)	Less than 10000	22 (5.5)
	10000-19000	99 (24.8)
	20000 and more	279 (69.8)
Father education	Illiterate	4 (1)
	Primary school	5 (1.3)
	Intermediate school	37 (9.3)
	High school	80 (20)
	Bachelor degree	184 (46)
	Above	90 (22.5)
Mother education	Illiterate	12 (3)
	Primary school	19 (4.8)
	Intermediate school	28 (7)
	High school	114 (28.5)
	Bachelor Degree	178 (44.5)
	Above	49 (12.3)
Willingness to work in rural	Yes	232 (58)
	No	168 (42)

[Table/Fig-1]: Distribution of the study population based on the demographic details.

Perceived barriers to work in rural areas

The perceived barriers to work in rural areas were unfavourable working condition 295 (73.80%), lack of transportation facilities 293 (73.30%), poor accommodation 282 (70.50%), less scope for professional development 278 (69.50%), lack of necessary infrastructure 268 (67%), low standard of living 267 (66.80%), less salary 255 (63.70%), difficulty in communicating with illiterate 247 (61.80%), human resources support 243 (60.80%) and less security 236 (59%).

Association between age and reasons to work in rural areas [Table/Fig-2]

Participants within the age group of 23 and above considered less competition, rural placement program and friendly environment as a reason to work in rural areas with a statistically significant p-value (≤ 0.05) and an odds ratio of 5.27, 2.38 and 0.38 within the age group of 23-25, respectively.

	Age					Exp (odds ratio) 23-25 years†
Parametres	Response		23-25	26 and above	p-value	
Less competition	Agree	Count (n)	206	6	**0.01***	5.27
		% within less competition	97.20%	2.80%		
Rural placement program	Agree	Count (n)	265	12	**0.008***	2.38
		% Rural placement program	95.7%	4.3%		
Friendly environment	Agree	Count (n)	179	20	**0.010***	0.38
		% within friendly environment	89.9%	10.1%		

[Table/Fig-2]: Association between age and reasons to work in rural areas.
*Statistically significant p-value ≤0.05; †Reference variable for odds ratio

Association between age and barrier to work in rural areas [Table/Fig-3]

Participants within the age group of 23 and above considered poor accommodation and unfavourable working condition as a barrier to work in rural areas with a statistically significant p-value (≤0.05) and an odds ratio of 1.64 and 3.19 of 23-25, respectively.

	Age					Exp (odds ratio) 23-25 years†
			23-25	25 and above	p-value	
Poor accommodation	Agree	Count (n)	269	13	**0.014***	1.64
		% Poor accommodation	95.4%	4.6%		
Unfavourable working conditions	Agree	Count (n)	283	12	**0.001***	3.19
		% within unfavourable working conditions	95.9%	4.1%		

[Table/Fig-3]: Association between age and barrier to work in rural areas.
*Statistically significant p-value ≤0.05; †Reference variable for odds ratio

Association between gender and reasons to work in rural areas [Table/Fig-4]

Male and female participants considered less competition, broader clinical exposure, serve the under-served community, higher job security, friendly environment, and fees and loan forgiveness as reasons to work in rural areas with a statistically significant p-value (≤ 0.05) and an odds ratio of 2.53, 2.04, 1.60, 2.01, 2.19 and 2.45 for male participants, respectively.

Factors	Gender					Exp (odds ratio) Males†
		Responses	Male	Female	p-value	
Less competition	Agree	Count (n)	141	71	<0.001	2.53
		% within less competition	66.5%	33.5%		
Broader clinical exposure	Agree	Count (n)	130	66	<0.001	2.04
		% within broader clinical exposure	66.3%	33.7%		
Serve under served community	Agree	Count (n)	159	99	<0.001	1.60
		% within serve under served community	61.6%	38.4%		
Higher job security	Agree	Count (n)	135	64	<0.001	2.01
		% within higher job security	67.2%	32.8%		
Friendly environment	Agree	Count (n)	178	20	<0.001	2.19
		% within friendly environment	67.8%	32.2%		
Fees, loan forgiveness	Agree	Count (n)	174	95	<0.001	2.45
		% within fees, loan forgiveness	64.7%	35.3%		

[Table/Fig-4]: Association between gender and reasons to work in rural areas.
*Statistically significant p-value ≤0.05; †Reference variable for odds ratio

Association between marital status and reasons to work in rural areas [Table/Fig-5]

Married and unmarried participants considered need for job and rural placement programme as reasons to work in rural areas with a statistically significant p-value (≤ 0.05) and an odds ratio of 0.46 and 0.61 in unmarried participants, respectively.

Association between marital status and barrier to work in rural areas [Table/Fig-6]

Married and unmarried participants considered poor accommodation, less scope for professional development and unfavourable working condition as barriers to work in rural areas with a statistically significant p-value (≤0.05) and an odds ratio of 0.58, 0.49 and 0.66 in unmarried participants, respectively.

Param-etres	Marital status					Exp (odds ratio) Married†
		Responses	Married	Unmarried	p-value	
In need for a job	Agree	Count (n)	44	245	**0.041***	0.46
		% within in need for a job	15.2%	84.8%		
Rural placement program	Agree	Count (n)	40	237	**0.011***	0.61
		% within Rural placement program	14.4%	85.6%		

[Table/Fig-5]: Association between marital status and reasons to work in rural areas.
*Statistically significant p-value ≤0.05; †Reference variable for odds ratio

Factors	Marital status					Exp (odds ratio) Married†
		Response	Mar-ried	Unmar-ried	p-value	
Poor accommodation	Agree	Count (n)	42	240	**0.031***	0.58
		% within poor accommodation	14.9%	85.1%		
Less scope for professional development	Agree	Count (n)	40	238	**0.010***	0.49
		% within less scope for professional development	14.4%	85.6%		
unfavourable working conditions	Agree	Count (n)	44	251	**0.002***	0.66
		% within unfavourable working conditions	14.9%	85.1%		

[Table/Fig-6]: Association between marital status and barrier to work in rural areas.
*Statistically significant p-value ≤0.05; †Reference variable for odds ratio

DISCUSSION

The aim of this study was to assess the perception of dental interns towards working in rural areas, in Riyadh, Saudi Arabia. It also assessed their willingness to work in rural areas, considering the favouring factors associated with their decision as well as the perceived barriers withholding them from working in rural areas, moreover to find out whether demographic data (age, gender, marital status) had an impact on their decision or not. This is the first study to be conducted in Saudi Arabia which has attempted to know the willingness and perception of dental interns towards working in rural areas. It could help policy makers to set up new modalities to plan future dentist distribution among the entire country including urban and rural areas taking into account the favouring factors and the perceived barriers.

The mean age of the participants in the present study study was 24.1 years which is almost similar to a study conducted in Thailand by Thammatacharee N et al., where the mean age was 24.3 [8]. In this study, the number of male participants were 230(57.5%), similar to a study done by Silva M et al., in Victoria where the male participants number were 62(56.9%) [9]. On the contrary, a study was conducted by Sharma V et al., in India had only 100(19.84%) male participants, the reason behind this discrepancy could be most of dental students in Indian population are usually females [7]. And also, study done by Thammatacharee N et al., in Thailand had only 61 (30%) male participants, because females made up the majority of the health care professions [8].

Inspite of most of our participants were Saudi nationals 348 (87%), and the reason behind that is most of the dental colleges in Riyadh do not accept non-saudi applicant, there is a significant association found between nationality and willingness towards working in rural areas.

The number of single participants in the present study is 329 (82.3%), which is quite similar to a study conducted by Ossai E et al., in Nigeria where the single participants made up 90.6% of the total participants, which is also similar to a study done in by Choudhary Y et al., in central India, where the single participants made up around 96.04% of the total participants [10,11].

A total of 316 (79%) of the participants in this study have their family residing in urban areas, this could be because the study was conducted in Riyadh city only, similarily, a study conducted by Thammatacharee N et al., in Thailand revealed that 77% of the participant have their family residing in urban areas [8].

In the present study, monthly family income did not have an impact on the participant decision, whereas, a medical study that was done by Syahmar I et al., in Indonesia, among medical students had an impact on their decision, where participants with more family monthly income were less interested in working in rural areas [12].

In the present study, it was found the father education has an impact on the decision of the participants. The more the father is educated, the less willingness of participants to work in rural areas. It could be because of the good lifestyle which is associated with good income.

A total of 232 (58%) of the participants in our study were willing to work in rural areas. Similarly, a study conducted by Sharma V et al., in India, 277 (55%) of the participants were willing to work in rural areas [8].

In the present study we also assessed the factors that could favour the decision of working in rural areas. The most favouring factor is 'close proximity to hometown', then 'the need for a job', followed by 'rural placement program' in which dental interns have the opportunity to gain sufficient experience to work in rural areas confidently after they have finished the program.

A total of 297 (74.3%) of the participants agreed that 'close proximity to hometown' would be a reason to work in rural areas, giving that in regions like Riyadh transportation could be an issue due to the traffic, financial reasons and long distances, so they prefer to work in their hometown rather than the urban areas. Similarly, a study conducted by Thammatacharee N et al., in Thailand suggesting the most favouring factor is 'close proximity to hometown' 62 (30.5%) [8]. Although, the percentage is not on the par with this study, but it is the most favouring factor. In contrast, a study conducted by Sharma V et al., in India 81 (28.7%) of the participants agreed that 'close proximity to hometown' is a favouring factor [7].

The second most favouring factor in this study is 'the need for a job'. A 289 (72.3%) of the participants in this study agreed that 'the need for a job' is a factor favouring their choice to work in rural areas. While in a study conducted by Sharma V et al., in India 123 (43.6%) of the participants considered that 'the need for a job' is a favouring factor, this could be because of good potential income over the practice life [7].

The third most favouring factor is 'rural placement program', Programs that recruit student to have rural rotation and exposure to rural area, play a significant role toward working in rural after graduation. In a study conducted by Johnson G and Blinkhorn A in Australia showing that only 54.8% of the participants were considering working in rural areas before rural placement program [13]. After the rural placement program, 96.9% of the participants considered working in rural areas, a 42% increase in favour of working rurally. The study also assessed the perceived barriers for the dental interns from working in rural areas. 'Unfavourable working conditions' and 'lack of transportation' were the two most perceived barriers from working in rural areas. In addition, 'less scope for professional development' where 278 (69.5%) of the participants in this study agreed that it is considered a barrier from working in rural areas. Similarly, a study conducted in India by Sharma V et al., showing that 97 (43.7%) of the participants agreed to the same factor to be a barrier. In contrast, a study conducted by Saini NK et al., in India 25 (12.4%) of the participants chose that 'less scope for professional development' is a barrier from working in rural areas [7,14].

A 268 (68%) of the participants in the present study agreed that lack of necessary infrastructure is as a barrier from working in rural areas. Likewise, in another study conducted by Saini NK et al., in India where 123 (61.2%) and another study was done by Ravi Shankar P et al., in Nepal where 114 (61.6%) of the participants chose 'lack of necessary infrastructure' as a barrier [14,15].

Limitation(s)

The data is representing only dental colleges located in Riyadh, so it cannot be generalised to entire country. Since this a questionnaire survey and was aimed to know the willingness of the dental interns towards working in rural areas, there could be social desirability bias. In few areas, the comparisons were done in Medical intern, while in the other areas, comparisons were made with dental intern, due to shortage in subjects of same studies. This must have also incorporated some bias.

CONCLUSION(S)

This paper is the first study conducted among dental interns in Riyadh, Saudi Arabia to assess their perception towards working in rural areas. There are number of factors that are associated with their responses. The results of the study also highlight the willingness of the dental interns towards working in rural areas. The interns considered close proximity to hometown, need for a job, and rural placement program are the main favouring factors for working in rural areas. In contrast, unfavourable working conditions, lack of transportation facilities, and poor accommodation are the main perceived barriers for working in rural areas. The male participants, Saudi nationals, rural residents, and the one whose fathers are less educated, were more likely to work in rural areas. Author's strongly recommend similar studies need to be conducted in other parts of the country to get a better picture. These findings should be considered by the policy makers and medical educators to design and implement a comprehensive human resource strategy that shall target specific factors to encourage dental students to choose job positions in rural areas, which could improve the even distribution of the dental workforce.

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