

Awareness and Acceptance of Dental Therapists among Dentists: A Cross-Sectional Study among Dentists in Jeddah, Saudi Arabia

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Abstract

Objectives: Here we aimed to assess the awareness of dentists about dental therapists and to evaluate the dentists' perception of dental therapists in Jeddah, Saudi Arabia.

Methods: In this cross-sectional study, a survey was distributed to 150 practising dentists in three major governmental hospitals in Jeddah. Responses were accepted from March 1, 2017, to May 31, 2017. The data were entered into a Microsoft Excel spreadsheets and analysed using the Statistical Package for the Social Sciences (SPSS), version 22. Descriptive statistics, bivariate analyses, and a binary logistic regression model were performed, assuming a normal distribution, a significance level at $p < 0.05$, and 95% confidence intervals.

Result: Most (65.8%) of the study participants believed that dental therapists could be part of the overall dental care solution. Moreover, 73% believed that dental therapists provide good dental service in remote areas in Saudi Arabia. However, 52.3% of the dentists believed that hiring a dental therapist would expose the dental practice to legal liability, and 56.8% of them believed that hiring a dental therapist would not yield sufficient benefit to warrant the cost to the dental practice. The binary logistic regression model indicated that dentists' acceptance of dental therapists as a workforce on dental teams was influenced by their knowledge, attitude, and fear of negative financial effects.

Conclusion: Dentists' knowledge and positive attitude were the most important predictors that enhanced the acceptance of dental therapists in the dentist community. Future study to evaluate detailed dentists' acceptance of dental therapists for both reversible and irreversible procedures is needed.

Keywords: Dental Therapists; Mid-Level Dentistry; Dental Team; Dental Awareness; Acceptance of Dental Therapist

Introduction

Dental therapists are members of dental teams and are often responsible for examination and diagnosis of dental health and the development of simple treatment plans. Dental therapists are certified to perform simple dental procedures and refer patients who need advanced dental treatment [1]. Dental therapists provide most of the oral health care services to children in school-based clinics in New Zealand and some areas of Australia. Most of these dental therapists are employed by School Dental Services (SDS) and work off-site in the remote rural area [1,2].

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The concept of dental therapists begun appearing in the United States in the frontier areas of Alaska, which are difficult to staff with dentists. The aim was to have providers from the same community, with minimal education, to remain within and serve their community [3]. In the United States, it takes up to 8 years of post-high-school training to graduate as a dentist, whereas dental therapists can be trained in 2 years [4]. Dental therapists' scope of practice is restricted to basic care, including cavity filling, performing stainless steel crown fitting, primary tooth pulp therapy, and simple extractions [5]. In school-based programs, dental therapists are significantly devoted to preventive treatment, such as dental health education and topical fluoride application and sealant [6].

Dental therapists are the solution to the dental care access problem in isolated and low-income areas because they provide services at a lower cost than dentists. Also, dental therapists can help dentists to reduce their working hours and to focus on more complex procedures [5]. A review in the United States by Nash DA., *et al.* found evidence that dental therapists provide safe, effective, and quality care for children in an economical manner. The services provided by dental therapists are accepted by both the public and the dental profession [7].

A study done by Ruth Freeman., *et al.* showed that dental therapists and hygienists have adequate skills to meet the dental demands in remote rural areas [8]. On the other hand, some dentists did not believe that dental therapists would alleviate the oral health disparity [9]. Moreover, other studies showed an opposing belief toward dental therapists, and this opposition is based on two major concerns. The first concern was the training and education of dental therapists and whether a 2-year training program was sufficient to provide this mid-level practitioner with the scientific background required to do irreversible dental procedures. Therefore, dentists' supervision would be required to oversee dental therapist performance. The dentists' second concern was the financial impact of a dental therapist on their income [7,10-12].

The prevalence of dental caries in Saudi Arabia among 6- to 7-year-old children has been ranging between 74% and 93%, depending on the region in Saudi Arabia. The median prevalence of dental caries among adults in Saudi Arabia was found to be 86%, and that could be attributed mainly to lack of access to dental health services [13,14]. A similar problem has been seen in the United States. Children from remote rural areas and low-income and minority families receive less care due to inadequate access to oral health services [6].

Awareness and acceptance of dental therapists in the dental profession vary from one country to another. In 2011, a study by Naty Lopez., *et al.* reported that 58% of the participants have a good knowledge of the dental therapist role in dental care practice [15]. The objectives of the current study are to assess dentists' awareness of dental therapists and to evaluate the dentists' perception toward the dental therapist in Jeddah, Saudi Arabia.

Materials and Methods

An online search was done to find related published literature regarding dental therapists, both nationally and internationally. The databases of PubMed and Google Scholar were searched using keywords "dental therapist", "awareness of dental therapists" and "acceptance of dental therapists". Ethical approval was obtained from the Dental Hospital of King Abdulaziz University, Jeddah, KSA. In this cross-sectional study, a survey was distributed to 150 practising dentists in three major governmental hospitals in Jeddah, Saudi Arabia. The inclusion criteria for study participants were to be officially employed as a general or specialised dentist of either gender and practising in Jeddah. The research team approached each participant with an electronic survey form.

The survey was adopted from a previous study [15] and modified to accommodate the objectives of our study. The survey was constructed in the English language and consisted mainly of two parts, with a total of 19 questions. The estimated time for survey completion was about 10 - 15 minutes. The first part of the instrument included questions about the socio-demographic data of the participating dentists' (gender, nationality, and level of practice). The second part of the survey started with a question asking the participants if they are familiar with the concept of dental therapists. Moreover, if they answered negatively, a new window would open for them with a box containing the following description; "Dental therapists are the part of dental teams who have the responsibility of examination and diagnosis

of dental health and development of simple treatment plans. They are certified to perform simple dental procedures and refer patients who need advanced dental treatment [1]. The questionnaire continued with questions evaluating the domains of dentists’ knowledge of dental therapists, attitude toward dental therapists, and fear of financial impact on the practice due to the existence of dental therapists. The duration for accepting all responses was from March 1, 2017, to May 31, 2017.

The data were entered into Excel spreadsheets and analysed using the Statistical Package for the Social Sciences, version 22 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to define the background characteristics of the study population. Bivariate analyses, including the chi-square test, were used to examine potential associations between categorical variables.

Dentists’ acceptance of dental therapists was defined as a dependent outcome variable in a binary logistical analysis. A binary logistic regression model was conducted to estimate the effect of “dentists’ knowledge”, “attitude” and “fear of negative financial impact” as predictors with “dentists’ acceptance of dental therapists” as an outcome. Therefore, these predictors were created by combining the responses of all the questions in each domain to construct collective continuous “knowledge”, “attitude”, and “fear of negative finance” variables. When the participating dentist scores one point higher in each of these predictor variables, the subject was considered as being collectively more knowledgeable, having a more positive attitude or having more fear of negative finance impact. All these tests were done with 95% confidence intervals, the assumption of a normal distribution, and a significance level of 0.05.

Results

A total of 112 dentists agreed to participate in the study out of 150 dentists, with a response rate of 74.7%. About 40.5% of the study population was male. Almost 83% of the study population was Saudi dentists, and 65.7% of them were specialists (Table 1). About 59% of the study population did not know about dental therapists, and after a brief description of dental therapists, the dentists’ knowledge increased to 93.7%. Moreover, 65.8% of the dentists believed that dental therapists could be part of the solution to provide access to dental care in Saudi Arabia; and 73% of the dentists believed that a dental therapist is a good dental service provider in remote areas in Saudi Arabia. However, 52.3% of the dentists believed that hiring a dental therapist would expose the dental practice to legal liability, and 56.8% of them believed that hiring a dental therapist would not yield sufficient benefit to warrant the cost to the dental practice. About 35.1% of the dentists believed that a dental therapist would affect their income negatively. The overall dentists’ acceptance of dental therapists as part of their dental team was 77.5%. A full profile of dentists’ knowledge and attitudes toward dental therapists is presented in table 2.

Variable		Percentage
Gender	Male	40.5%
	Female	59.5%
Nationality	Saudi	82.9%
	Non-Saudi	17.1%
Level of Practice	General Dentist	34.3%
	Specialist	65.7%

Table 1: Demographic Characteristics of the Study Population.

Screening the study participants for knowledge, attitude, and acceptance for dental therapist	Percentage	
	Yes	No
Have you ever heard about dental Therapists?	40.9%	59.1%
After Reading brief description about dental Therapist, do you understand dental therapist role in dental practice?	93.7%	6.3%
Do you believe 2-year training is adequate for dental therapists?	42%	58%
Do you believe dental therapists will be part of the solution to access to dental care in Saudi Arabia?	65.8%	34.2%
Do you believe dental therapist is a good dental service provider in remote areas in Saudi Arabia?	73%	27%
Do you believe that dental therapists will require a lot of supervision by dentists?	75.7%	24.3%
Do you believe dentist’s supervision over dental therapist in the practice is added responsibility and burden?	69.4%	30.6%
Do you believe dental therapist will allow more time for dentists to focus on more complex dental procedures?	76.6%	23.4%
Do you believe dental therapist will affect the dentist’s income negatively?	35.1%	64.9%
Do you believe hiring a dental therapist will expose the dental clinic to legal liability?	52.3%	47.7%
If you hired dental therapist, do you believe they will put more financial cost (salary, dental clinic time) compared to benefit on the dental practice?	56.8%	43.2%
Do you accept dental therapist as a part of the dental team?	77.5%	22.5%
Do you believe patients will accept dental therapists?	58.6%	41.4%

Table 2: Dentists’ Knowledge and Attitude Toward Dental Therapists.

Bivariate analysis indicated that female dentists would accept dental therapists as part of the dental team 3.2% more often than male dentists. Saudi dentists showed 17.2% higher acceptance of dental therapist than non-Saudi dentists. Also, general dentists showed 6.2% more acceptance of dental therapists than specialised dentists did (Table 3).

Demographic variable		Would you accept dental therapist as a part of the dental team?		P-value
		Yes	No	
Gender	Male	75.6%	24.4%	0.6
	Female	78.8%	21.2%	
Nationality	Saudi	80.4%	19.6%	0.1
	Non-Saudi	63.2%	36.8%	
Level of Practice	General Dentist	81.6%	18.4%	0.7
	Specialist	75.4%	24.6%	

Table 3: Bivariate Analysis to Estimate Potential Association of Demographic Variables with Acceptance of Dental Therapist.

Binary logistic regression was performed to assess the effect of the dentists’ knowledge, attitudes, and fear of negative finance pressure as potential confounding factors in dentists’ acceptance of dental therapists as an outcome. The model indicated that dentists’ acceptance of dental therapists increased by 2.5-times as the dentists’ knowledge increased, and it was statistically significant with a p-value less than 0.001. Moreover, dentists’ acceptance increased by 6.4-times as the dentists’ positive attitude increased toward dental therapists, and this was statistically significant ($p < 0.001$). On the other hand, as the dentists’ fear of negative finance effect increased due

to the presence of dental therapists; 51.4% less acceptance of dental therapist was observed. However, this finding was not statistically significant ($p = 0.2$) (Table 4).

Variables in the Equation	Odd Ratio	95% C.I.		p-value
		Lower	Upper	
Knowledge	2.531	1.601	4.003	< 0.001 ^a
Fear of Negative Finance	.486	.158	1.488	0.20
Attitude	6.430	2.094	19.745	0.001 ^a
Constant	.012			< 0.001 ^a

Table 4: Binary Logistic Regression Model (BLRM), with Backward Conditional Elimination Criterion to Estimate the Effect of Predictors on the Dentists’ Acceptance of Dental Therapist.

Discussion

The primary goal of introducing middle-level dental practitioners is to improve access to dental care [10]. Dental therapists work under the supervision of certified dentists, and they help reduce oral health disparities and enhance access to oral health care services [16,17]. In the current study, the dentists’ initial knowledge about dental therapists was 40.9%. However, that knowledge was increased to 93.7% after a brief description of dental therapists and their scope of work. Almost 65.8% of the surveyed dentists believed that dental therapists would be part of the solution to access the dental care in Saudi Arabia. Also, 73% of the dentists believed that the dental therapist model is a good service provider in remote areas in Saudi Arabia. Studies in the dental literature indicated a global and international belief that dental therapists are good dental service providers in underserved groups and remote locations [11,12,18,19]. Nonetheless, some studies showed major concerns towards the effectiveness of dental therapists training and the need for dentists supervision [9-12]. These findings were also observed in the current study, with 58% of the participating dentists not believing that a 2-year program is adequate for dental therapist training. Moreover, almost 76% believed that dental therapists require extensive supervision by dentists, and 69.4% of them believed that supervision over a dental therapist would place an extra burden on the dentist. Moreover, more than half of the surveyed dentists in this study believed that hiring dental therapists might expose the dental practice to legal liability.

The financial impact of a dental therapist is a controversial issue. International findings indicate that dentists are trying to protect their profession and financial security because the dental therapy movement is expanding and providing dental services at lower cost [12,20-22]. On the other hand, dental therapists could have a positive impact on dentists; large private dental practices tend to use dental therapists to boost the daily patient volume [23]. Other studies showed that dental therapists would not affect dentists’ income [24]. In this study, about 35.1% of the surveyed dentists believed that a dental therapist would negatively affect the dentist’s income, and 56.8% believed that dental therapists would present an increasing financial burden over benefit on the dental practice.

In the current study, binary logistic regression was done to quantify the un-confounded effect of dentists’ knowledge, attitudes, and fear of negative financial impact as predictors of dentists’ acceptance as an outcome. The results of this study show that dentists’ knowledge and attitude have significantly increased the odds of dentists’ acceptance of dental therapists by 2.5- and 6.4-times, respectively. Both knowledge and attitude have a directly proportional effect on dentists’ acceptance of dental therapists.

It took 4 years of dentists’ education about dental therapists and their scope of work to change their attitude more positively, leading to 60% more acceptance of dental therapists [15,25]. The un-confounded effect of “fear of negative financial impact” was also estimated in the logistic regression, indicating 51.4% fewer acceptances as the fear increased. However, this finding was not statistically significant. This fear comes from the fact that dentists are trying to protect their profession and economic benefits [12]. Studies have shown no evi-

dence of negative cost-effectiveness from dental therapists within the context of dental practice [18,26]. Moreover, other studies have suggested that the dental therapist model represents potentially cost-effective care in the private sector [27].

This study is based on a self-reported questionnaire that might introduce self-reported bias and underestimate the outcome. Future studies to evaluate detailed dentists' acceptance of dental therapists in doing reversible and irreversible procedures is needed. Moreover, we would recommend examining the patient's acceptance of dental therapist as a dental health care provider.

Conclusion

The study indicated an initial and measurable acceptance of dental therapists as dental care providers by practising dentists in Jeddah, Saudi Arabia. They believed that dental therapists would be good dental service providers in remote areas. Dentists' knowledge and positive attitude were the most important predictors that enhanced the acceptance of dental therapists among the dentist community. Dentists' fear of negative finances was found to be a factor that might decrease the acceptance of dental therapists. However, this financial fear did not significantly influence dental therapist acceptance.

Conflict of Interest

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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