

DENTAL STUDENTS AND DENTISTS' AWARENESS IN HANDLING PEDIATRIC PATIENTS HAVING SYSTEMATIC DISEASES IN RIYADH

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ABSTRACT

It is a well-known fact that maintenance of oral health is a particularly important aspect to have a good general health and having a better quality of life. The oral cavity can be responsible for showing the symptoms of the systemic disease and maybe affected by the same, thus it can help in raising an early alarm. This is a cross-sectional study performed among the dental students and dentists in Riyadh using an online survey. Dental universities, hospitals and clinics in Riyadh were contacted and participants were demanded to fill up the survey.

Totally 381 responses were received from the participants, which included 66% females and 34% males, 72% students/interns and 28% general practitioners. The general practitioners show significantly higher levels of knowledge as compared to students/intern group with majority of the p-values less than 0.05. Overall knowledge and awareness among the participants was on the lower side. There is need to educate students about the association of rare systemic conditions among children and their effect on the oral health.

Key words: Systemic diseases, Oral health, Pediatric patients, Knowledge.

Introduction

Children having systemic diseases face problems related to oral cavity markedly greater than their healthy equals. If there is any neglect or any form of delay in addressing the problem faced, it can lead to significant illness for the child having such diseases. Hence the pediatric dental professional plays an integral role in order to prevent, stabilize and treat these oral and dental problems which can potentially compromise the child's health and quality of life before, during, and after the treatment [1-3].

The oral microbiome may disrupt the balance between a healthy individual and a person with disease both locally and systemically [4]. Due to its nature within the oral cavity, bacteria, fungi, protozoa, and viruses can individually and collectively all be found. These may strongly interact with each other and with the host leading to either sickness improving the health. Systemic diseases with oral symptoms include but are not limited to autoimmune, hematologic, endocrine, and neoplastic processes. In some cases, kids' oral changes can be attributed to rare cancers, including Langerhans cell histiocytosis, or infectious etiologies, such as Kawasaki disease [5, 6].

It is a well-known fact that maintenance of oral health is a particularly important aspect to have a good general health and a better quality of life. The oral cavity can be responsible for showing the symptoms of the systemic disease and

maybe affected by the same, thus it can help in raising an early alarm. Therefore, it is significant for the primary care providers to carefully study the oral cavity while arriving at their diagnosis. In addition, these systemic diseases and their treatments adversely affect patient's oral health and therefore warrant a more collaborative effort between the primary care providers and dentists. Severe oral symptoms of systemic disease generally involve teeth and/or gums. Hence, it is also of utmost importance that such oral and/or dental symptoms are handled with care and precautions by dental team. Moreover, due care must be given mainly because of the drugs a patient may be taking for these diseases [7, 8].

As indicated, therefore, the dentists need to be aware of such symptoms to effectively treat the pediatric patients. Several studies have been undertaken to evaluate the awareness. In one such study it was found that the medical and dental students generally showed a good attitude and knowledge of the collaboration between medical and dental practice in Hong Kong which is important to improve effectiveness and standards of care [9].

A study concluded that dentists should increase their awareness of patients' perceptions, preferences, and fear to meet patient's needs. Therefore, their studies must include guidelines and techniques to educate the future dentists for excellent practice in pediatric dentistry [10]. An investigation by Arafa, *et al.* (2017) aimed to determine the

association of asthma with oral health in children [11]. The findings of the present research disclosed that asthmatic children produced significantly elevated def, DMF score, and GI mean values in comparison to the control groups. Severe asthmatics substantially showed the highest def and GI score. Salivary analysis showed reduced stimulated salivary flow rate and altered salivary pH. Moreover, significantly raised mean salivary calcium level found to be linked with higher GI mean score.

Dental Caries is a multifactorial oral disease that is often discovered in the people with Obesity and Diabetes Mellitus, even though its outbreak in systematic reviews is debatable. The relationship between gingivitis, Periodontal Disease and Dental Caries share resembling behaviors, i.e. insufficient oral hygiene practices and unhealthy dietary intake. Inadequate tooth brushing and consumption of sugary food can result in greater harmful oral impacts. Preserving oral health will prevent oral chronic diseases and amend the results of chronic inflammatory processes. Therefore, the care of obese and diabetic patients needs a multidisciplinary team with medical and dental health professionals [12].

Study Hypotheses

Knowledge of dental students regarding the oral health of pediatric patients with systemic diseases is lower as compared to practicing dental practitioners.

Aims of the Research

- To specify the level of awareness among the dentists and dental students regarding the oral health of pediatric patients with systemic diseases
- To compare the level of awareness between dentists and dental students

Materials and Methods

Study Design

This is a cross-sectional research carried out among the dental students and dentists in Riyadh by an online survey.

Study Sample

Dental universities, hospitals and clinics in Riyadh were contacted and participants were demanded to fill up the survey.

Study Instrument

Online questionnaire was formed including questions about personal and demographic data followed by questions linked to systemic diseases and their association with oral health in pediatric patients.

Instrument Validity and Reliability

A pilot study was performed by sending the survey to 20 participants and the data was entered SPSS version 22 to specify the reliability using Cronbach's coefficient alpha. Validity of the questionnaire was examined by sending it to

experienced researchers in REU and changes were made according to their feedback and comments.

Statistical Analysis

The gathered data was analyzed using SPSS version 22, where descriptive as well as inferential statistics were performed. Comparisons between groups will be made with the value of significance kept under 0.05 using Chi-square test and correlations were done using Spearman's correlation as the data was not normally distributed.

Results and Discussion

Regarding the reliability of the questionnaire, we received the Cronbach's alpha value to be .811, which shows good reliability. Power of sample was also calculated, and the value came out to be 0.86, which is very good too (**Table 1**). A total of 381 responses were received from the participants, which included 66% females and 34% males, 72% students/interns and 28% general practitioners (**Figures 1 and 2**).

Table 2 shows the survey questions and their responses with percentages mentioned. It can be noted that merely 18.2% participants reported to be their understanding of relationship of pediatric systemic diseases with oral health to be high. Overall, the association of various types of systemic diseases with oral health was revealed to be moderate by the study participants. **Table 3** indicates the comparison of survey questions based on gender, which shows that the majority of differences were not statistically significant. Significant comparisons were found when inquired about the association of Down's syndrome with oral health and females reported higher association as compared to males (p-value: .008). Similarly, females showed better knowledge than males when inquired about the association of asthma and cardiac disease with oral health (p-values .049 and .034, respectively).

As far as the comparison on the basis of participants' qualification was concerned, contrasting results from gender comparison were found as majority of the differences between students/interns and general practitioners were statistically significant. The general practitioners show significantly higher levels of knowledge as compared to students/intern group with majority of the p-values less than 0.05 (**Table 4**).

Finally, **Table 5** shows the correlation done between qualification and level of association among various systemic diseases. Spearman's correlation was done to determine this, and it was expectedly noted that positive correlation existed among the qualification and level of association of systemic disease with oral health with a large majority correlation being statistically significant (p-value < 0.05).

Cronbach's alpha: 0.811

Power of Sample

Table 1. Power of Sample

Mean	1.88
Std Deviation	0.72
Sample size	381
Alpha	0.05
Sample mean	1.98
Standard Error of Mean	0.04
Critical Value	1.94
Beta	0.14
Power	0.86

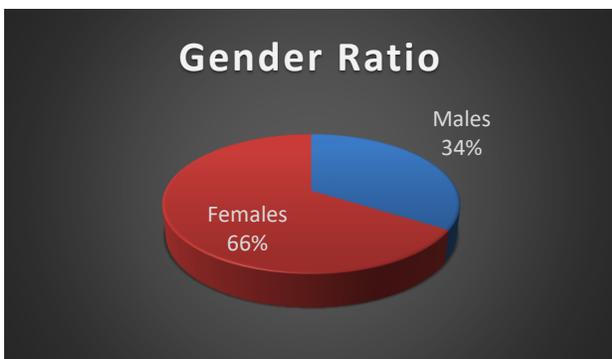


Figure 1. Gender Ratio of Study Participants

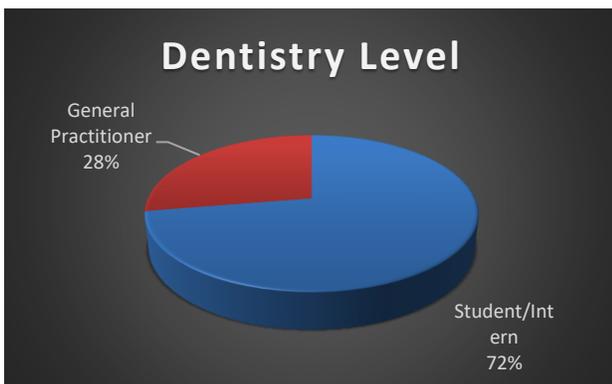


Figure 2. Dentistry Levels of Study Participants

Table 2. Survey Questions and their Response Frequencies by the Study Participants

Survey Questions	Response Frequencies
Your understanding of pediatric systemic diseases	Low: 29.5% Moderate: 52.6% High: 17.9%
Your understanding of relationship of pediatric systemic diseases with oral health	Low: 27.5% Moderate: 54.2% High: 18.2%

Association of Leukocyte disorders with oral health in children:	Low: 34.5% Moderate: 46.6% High: 18.9%
Association of Papillon-Lefe'vre syndrome with oral health in children:	Low: 38.4% Moderate: 40.8% High: 20.8%
Association of Down's syndrome with oral health in children:	Low: 26.8% Moderate: 44.7% High: 28.4%
Association of Hypophosphatasia with oral health in children:	Low: 36.1% Moderate: 45.3% High: 18.7%
Association of Diabetes Mellitus with oral health in children:	Low: 19.7% Moderate: 47.4% High: 32.9%
Association of Hand, foot and mouth disease with oral health in children:	Low: 31.8% Moderate: 46.3% High: 21.8%
Association of Kawasaki disease with oral health in children:	Low: 44.5% Moderate: 41.3% High: 14.2%
Association of Reiter's syndrome with oral health in children:	Low: 46.1% Moderate: 39.7% High: 14.2%
Association of Peutz-Jegher's syndrome with oral health in children:	Low: 32.6% Moderate: 46.1% High: 21.3%
Association of Gastroesophageal reflux with oral health in children:	Low: 35.5% Moderate: 43.4% High: 21.1%
Association of Asthma with oral health in children:	Low: 25% Moderate: 47.9% High: 27.1%
Association of Cardiac disease with oral health in children:	Low: 31.6% Moderate: 44.7% High: 23.7%
Association of Epilepsy with oral health in children:	Low: 34.2% Moderate: 42.9% High: 22.9%
Do you think you need more knowledge?	Yes: 86.1% No: 13.9%

Table 3. Comparison of Survey Responses Based on Gender of Study Participants

Survey Questions	Males	Females	p-value
Your understanding of pediatric systemic diseases	No statistically significant association		.964
Your understanding of relationship of pediatric systemic diseases with oral health	No statistically significant association		.788
Association of Leukocyte disorders with oral health in children:	No statistically significant association		.827

Association of Papillon-Lefe'vre syndrome with oral health in children:	No statistically significant association		.345
Association of Down's syndrome with oral health in children:	Low: 25% Moderate: 55% High: 20%	Low: 28% Moderate: 39% High: 33%	.008*
Association of Hypophosphatasia with oral health in children:	No statistically significant association		.079
Association of Diabetes Mellitus with oral health in children:	No statistically significant association		.088
Association of Hand, foot and mouth disease with oral health in children:	No statistically significant association		.524
Association of Kawasaki disease with oral health in children:	No statistically significant association		.372
Association of Reiter's syndrome with oral health in children:	No statistically significant association		.444
Association of Peutz-Jegher's syndrome with oral health in children:	No statistically significant association		.161
Association of Gastroesophageal reflux with oral health in children:	No statistically significant association		.250
Association of Asthma with oral health in children:	Low: 20% Moderate: 57% High: 23%	Low: 27% Moderate: 43% High: 29%	.049*
Association of Cardiac disease with oral health in children:	Low: 32% Moderate: 52% High: 16%	Low: 31% Moderate: 41% High: 27%	.034*
Association of Epilepsy with oral health in children:	No statistically significant association		.505
Do you think you need more knowledge?	No statistically significant association		.274

*Statistically significant (Chi-square test)

Table 4. Comparison of Survey Responses Based on Participants' Qualification

Survey Questions	Student/Intern	General Practitioner	p-value
Your understanding of pediatric systemic diseases	Low: 35% Moderate: 51% High: 14%	Low: 16% Moderate: 57% High: 27%	.000*
Your understanding of relationship of pediatric systemic diseases with oral health	Low: 33% Moderate: 56% High: 11%	Low: 12% Moderate: 50% High: 38%	.000*

Association of Leukocyte disorders with oral health in children:	Low: 38% Moderate: 48% High: 14%	Low: 26% Moderate: 42% High: 32%	.000*
Association of Papillon-Lefevre syndrome with oral health in children:	Low: 46% Moderate: 39% High: 15%	Low: 19% Moderate: 46% High: 35%	.000*
Association of Down's syndrome with oral health in children:	Low: 30% Moderate: 47% High: 24%	Low: 29% Moderate: 40% High: 41%	.002*
Association of Hypophosphatasia with oral health in children:	Low: 41% Moderate: 45% High: 13%	Low: 22% Moderate: 46% High: 32%	.000*
Association of Diabetes Mellitus with oral health in children:	No statistically significant association		.144
Association of Hand, foot and mouth disease with oral health in children:	Low: 38% Moderate: 44% High: 18%	Low: 16% Moderate: 52% High: 31%	.000*
Association of Kawasaki disease with oral health in children:	Low: 51% Moderate: 39% High: 10%	Low: 29% Moderate: 47% High: 25%	.000*
Association of Reiter's syndrome with oral health in children:	Low: 52% Moderate: 37% High: 11%	Low: 31% Moderate: 47% High: 22%	.001*
Association of Peutz-Jegher's syndrome with oral health in children:	Low: 38% Moderate: 44% High: 18%	Low: 19% Moderate: 50% High: 30%	.001*
Association of Gastroesophageal reflux with oral health in children:	Low: 39% Moderate: 44% High: 17%	Low: 26% Moderate: 43% High: 31%	.003*
Association of Asthma with oral health in children:	No statistically significant association		.071
Association of Cardiac disease with oral health in children:	Low: 35% Moderate: 46% High: 19%	Low: 22% Moderate: 42% High: 36%	.001*
Association of Epilepsy with oral health in children:	Low: 38% Moderate: 43% High: 20%	Low: 25% Moderate: 44% High: 31%	.015*
Do you think you need more knowledge?	No statistically significant association		.097

*Statistically significant (Chi-square test)

Table 5. Correlation of Survey Questions with Dentistry Level

Survey Questions	Dentistry Level
Your understanding of pediatric systemic diseases	$r_s: .202^*$ $p: .000$
Your understanding of relationship of pediatric systemic diseases with oral health	$r_s: .319^*$ $p: .000$
Association of Leukocyte disorders with oral health in children:	$r_s: -.184^*$ $p: .540$
Association of Papillon-Lefèvre syndrome with oral health in children:	$r_s: .279^*$ $p: .000$
Association of Down's syndrome with oral health in children:	$r_s: .169^*$ $p: .000$
Association of Hypophosphatasia with oral health in children:	$r_s: .235^*$ $p: .026$
Association of Diabetes Mellitus with oral health in children:	$r_s: .100$ $p: .052$
Association of Hand, foot and mouth disease with oral health in children:	$r_s: .217^*$ $p: .000$
Association of Kawasaki disease with oral health in children:	$r_s: .228^*$ $p: .000$
Association of Reiter's syndrome with oral health in children:	$r_s: .195^*$ $p: .000$
Association of Peutz-Jegher's syndrome with oral health in children:	$r_s: .195^*$ $p: .000$
Association of Gastroesophageal reflux with oral health in children:	$r_s: .166^*$ $p: .001$
Association of Asthma with oral health in children:	$r_s: .113$ $p: .028$
Association of Cardiac disease with oral health in children:	$r_s: .183$ $p: .000$
Association of Epilepsy with oral health in children:	$r_s: .148$ $p: .004$
Do you think you need more knowledge?	$r_s: .091$ $p: .077$

*Statistically significant (Spearman's correlation)

The present research aimed to assess the awareness levels of dental practitioners including students considering the association of various systemic diseases with oral health. Coincidentally, previously done studies have mainly focused on the relationship of systemic diseases with oral health in general. However, we aimed our study towards children and no other similar study has been done in the past after searching various eminent databases. Nevertheless, a comprehensive analysis of our findings with relation to existing literature will be narrated in this part of study.

We inquired our study participants about various systemic conditions among children and their association with oral health, of which cardiac diseases were included. As far as their general response was concerned, merely 23% reported a high association of the above-mentioned variables. Furthermore, when compared these responses on the basis of qualifications, it was observed that general practitioners had significantly higher level of knowledge regarding this issue thus showing that seniority matters when dealing with such patients. Resembling results were reported by Pérez *et al.*, (2019), who compared the knowledge levels of dental students and practitioners regarding the management of pediatric dental patients having endocarditis [13]. It was observed that the senior dental professionals and residents had better knowledge as compared to juniors.

When inquired about certain autosomal diseases and their association with oral health, the overall knowledge was low. A slightly better response was observed when questioned about the Down's syndrome, which is possibly due the fact that it is common and dental professionals come across such patients, frequently. However, much lower level of awareness was observed when asked about conditions such as Papillon-Lefèvre syndrome and Reiter's syndrome, which are rare, and this may be the reason behind the poor knowledge. Dental professionals' increased exposure to such cases and patients may be helpful in enhancing their knowledge therefore improving the chances of successful treatment [14].

Diabetes mellitus is also one of the conditions that has a strong association with oral health both in adults as well as in children. An encouraging number was observed in our findings when inquired the participants about this association. This is important to understand because of the increasing incidence of DM in Saudi Arabia. A local study conducted by AlMutairi *et al.*, (2020) reported high prevalence of diabetes mellitus related oral problems including caries and periodontal diseases [15]. In their present study, children in Saudi Arabia with diabetes mellitus had considerably higher oral health domain scores than the controls. Wholly, 82% of all subjects of the present study population was suffering from at least one of the following self-reported oral health problems: pain in the mouth, xerostomia, bad breath, and periodontitis.

Study Limitations

There is a scope of improvement in this study in future if more data can be incorporated in the form of bigger sample size. The ratio between comparison groups specially students/interns and general practitioners was not what we tried to achieve initially.

Conclusion

- Overall knowledge and awareness among the participants was on the lower side.
- No significant difference between gender was observed.

- General practitioners showed significantly higher levels of knowledge as compared to students/interns.
- There is need to educate students about the association of rare systemic conditions among children and their effect on the oral health.

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Conflict of interest: None

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Ethics statement: None

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