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Knowledge and Awareness on Infant Oral Health among Parents

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Abstract

One of the most common problems that children and infants face, which is due to lack of awareness and knowledge on the same, is Early Childhood Caries. If left untreated, this could complicate various diseases and this signifies the importance of a dental examination in infants. The main aim of this study is to analyse the knowledge and awareness on infant oral health among parents. A self administered questionnaire was circulated via an online google forms link among 150 parents and the statistical software used was SPSS version 22. The statistical test used was the descriptive statistics and Chi square test. The p value less than 0.05 was considered statistically significant. The confidence level of the study was set to 95%. In our study, 40.67% felt that the infant's oral cavity must be cleaned with wet cotton. 76.67% felt that infant's tooth development affects general health and 44.67% that parafunctional habits affect tooth development. Among the different educational groups of parents who had answered, the PG level educated parents had the highest knowledge among infant oral health. The PG level parents had the highest knowledge and awareness on infant oral health while secondary school level had the least knowledge. In general, the South Indian parents had a moderate level of awareness but, however still presented a need to increase this knowledge and awareness levels.

Key words: *Awareness, oral health, infant, parent, Early Childhood caries, level of education.*

Introduction

The practice of infant oral health refers to the task of keeping one's mouth clean and free from diseases caused by bacteria. Typically, children belonging to the age group 1 year and below fall under the category of infants.[1] Dental assessments for infants, even before the eruption of the primary teeth is extremely essential as it helps in the detection of Early Childhood Caries which if left untreated can complicate to various dental diseases. Any infant oral care program must include the potential risk assessment on risk factors associated with ECC, preventive treatments, education of parents on the importance of oral health and establishment of a positive impression about the dental clinic towards the child.[2] Across the nation, due to lack of proper awareness and lack of early assessment, 54.3% of infants suffer from ECC which not only affects the oral health but also the general health of the individual. To enhance this field, 10% of funds from the World Health Organisation is donated to infant oral health.[3] For both infants and adults, oral health implies the cleaning or maintaining the cleanliness of both the lips and mucosa. In infants, special care has to be taken to ensure that no food debris is left behind after a meal. The maintenance of hygiene helps in the proper development of the primary teeth and better oral health with suppressing the possibility of acquiring a heart disease as the infant develops in age.[4]

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Scientific researches suggested that poor knowledge and attitude among parents are the major reasons for bad oral health among infants. The reason behind this lack of awareness arises from the difference in socio-economic backgrounds and the poor literacy rates among parents.[5] The majority of parents show or possess a wrong attitude and mindset towards dental health care and in turn become the cause for their child's poor oral health. On conducting surveys to test the existing knowledge it was found that only 68% of the parents were aware of the methods used to clean the infant's oral cavity and the time from which this practice should be initiated.[6] Among other studies conducted, medical students had an opinion that tooth decay was one of the leading causes for ECC and the inability to express this led to the lack of dental treatment.[7] In most cases, family physicians and pediatricians often see the child upto 6 times before the child turns 2 years of age. These appointments are crucial to increase the awareness and opportunities of infant oral health and a need to spread awareness on the same.[8] Most parents however, prefer the choice of their pediatricians for a dental examination which usually occurs before 1 year of age. Pediatricians are also considered as oral health service providers.[9] The aggregation of bacteria can be reduced and a foetus' oral health can be improved by reducing the pathogenic bacteria. Lifestyle modification in association with this and therapeutic intervention must be practiced.[10]

Despite the previous researches conducted, they focused only on clinical health care and there were no standard measures for a defined and proper oral health care condition. The present study was conducted to eliminate these limitations and provide a proper standard for infant oral health. Proper awareness of UIP reduces millions of child deaths every year. Previously our team has conducted numerous original studies [11 – 17] and surveys [18 – 25] over the past 5 years.The main aim of this research is to analyse the knowledge and awareness on infant oral health among parents in the South Indian population and the need to spread awareness on the same.

Materials and Methods

The present study population consisted of parents in the South Indian population through an online setting. The study design was a questionnaire based cross sectional study, conducted in 2020 and approval was obtained from the Institutional Review Board. The total number of people involved in the study was 150 participants. The sampling method used was a simple random sampling. The following questionnaire was circulated via an online google forms link:

The questionnaire consisted of close ended questions and the validity checking was conducted by the faculty members of the institution. Google forms were used for the collection of data and the statistical software used was the SPSS software version 22. The statistical analysis was descriptive statistics to summarize demographic data and chi square analysis to analyse survey data. The p value less than 0.05 was considered as statistically significant and the confidence level taken was 95%.

Results and Discussion

Table 1: Table showing Frequency of responses

S. No	Question	Options	Response Percentage
1.	When should an infant's first dental visit be?	Immediately after birth	22%
		Within 6 months of eruption of first tooth	22.67%
		Whenever necessary	51.33%

Cont... Table 1: Table showing Frequency of responses

2.	How would you clean an infant's oral cavity?	Wipe with dry cloth	22%
		With wet cotton	40.67%
		With cotton and toothpaste	14%
		Soft toothbrush and toothpaste	15.33%
		Don't know	8%
3.	Do you think infant's tooth development affects general health?	Yes	76.67%
		No	23.33%
4.	Is it necessary for a parent to know the development rates of an infant's tooth?	Yes	78%
		No	22%
5.	Which of the following do you think can lead to irregular infant teeth?	Thumb sucking/tongue thrusting	36%
		Mouth breathing	19.33%
		Both	44.67%
6.	Does genetics affect the development of primary teeth?	Yes	79.33%
		No	20.67%
7.	Can prolonged breastfeeding practice have a potential increase on the risk of dental caries?	Yes	60%
		No	40%
8.	Do you think early loss of milk teeth can lead to malocclusion of permanent teeth?	Yes	66.67%
		No	33.33%
9.	Which of the following methods are useful in preventing ECC?	Maintaining good oral habits in infants	61.33%
		Anti caries vaccine	20.67%
		Both	18%

Cont... **Table 1: Table showing Frequency of responses**

10.	Do you think primary teeth are as important as permanent teeth?	Primary teeth are not important at all	18.49%
		Primary teeth are slightly important	19.18%
		Both are equally important	38.36%
		Yes	10.27%
		No	6.85%
		Don't know	6.85%
11.	When does the kid's first teeth begin to emerge?	Before 1 year	54.36%
		1st year	28.85%
		2nd year	2.68%
		3rd year	7.38%
		Don't know	8.72%
12.	When should a mother start cleaning her child's teeth?	When the first milk tooth erupts	55.33%
		When all the milk teeth have erupted	25.33%
		When the first permanent tooth erupts	15.33%
		Don't know	4%
13.	What size of toothpaste should be placed on a child's toothbrush?	Pea size	54.67%
		Bean size	24%
		Half the length of the toothbrush	17.33%
		Don't know	4%
14.	At what age should a child start brushing unassisted?	1-3 years	31.33%
		4-6 years	38%
		7-9 years	24.67%
		>15 years	3.33%
		Don't know	4%

***Cont...* Table 1: Table showing Frequency of responses**

15.	Food plays an important role in oral health?	Yes	74.67%
		No	20.67%
		Don't know	4.67%
16.	Does sugar consumption play a major role in oral hygiene?	Yes	66.67%
		No	26.67%
		Don't know	6.67%
17.	Fruit juices are more carcinogenic than whole fruits?	Yes	68.67%
		No	22.67%
		Don't know	8.67%
18.	Frequency of sugar consumption plays a greater role in producing caries than does the total amounts of sugar consumption?	Yes	68.67%
		No	22.67%
		Don't know	6.67%
19.	Retentiveness of food in the oral cavity is linked to dental caries?	Yes	66.67%
		No	26%
		Don't know	7.33%
20.	Does fluoride prevent dental caries?	Yes	67.33%
		No	22.67%
		Don't know	10%
21.	Do you think there is a need to improve parent knowledge on infant oral health?	Yes	88.67%
		No	11.33%

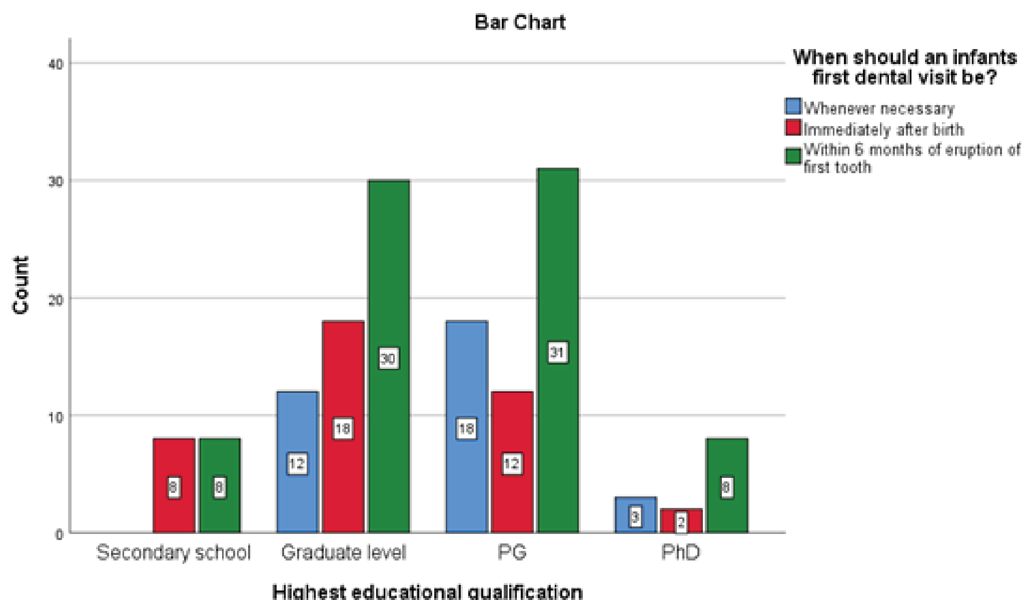

Figure.1- Bar graph showing comparison of responses between highest educational qualification and infant's first dental visit. X-axis represents the highest educational qualification of parents and y-axis represents the number of parents responded. Blue colour represents whenever necessary, red colour represents immediately after birth and green colour represents within 6 months of eruption of the first tooth. PG level of educated parents showed more awareness (31) on an infant's first dental visit, but it was not statistically significant (Chi square test p=0.096 - Indicating statistically not significant).

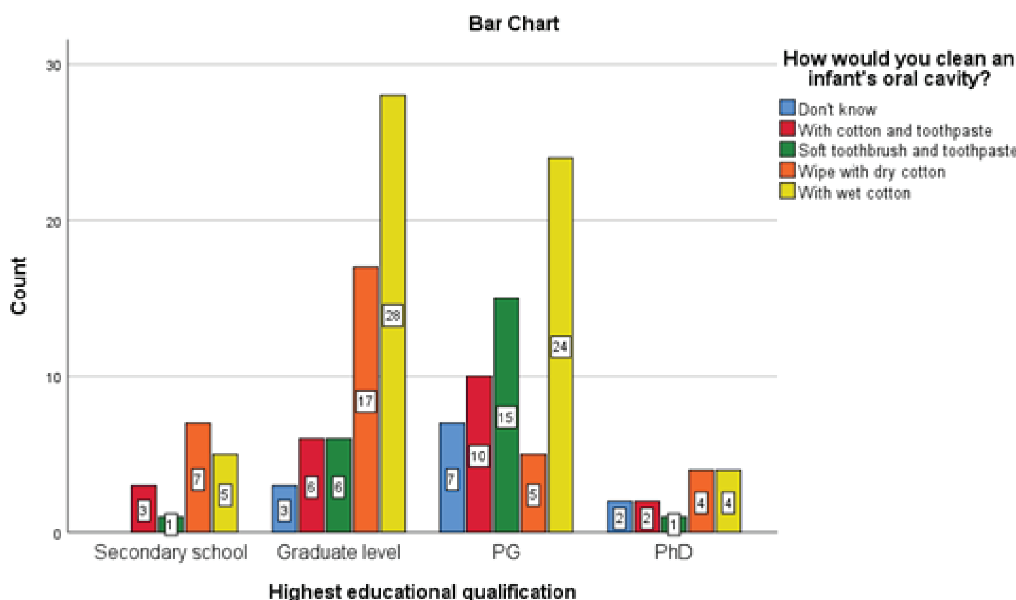

Figure.2- Bar graph showing comparison of responses between highest educational qualification and cleaning of an infant's oral cavity. X-axis represents the highest educational qualification of parent and y-axis represents the number of parents who responded. Blue colour represents don't know, red colour represents cotton and toothpaste, green colour represents soft toothbrush and toothpaste, orange colour represents wipe with dry cotton and yellow colour represents wet cotton. Graduate level educated parents showed more awareness (28) on cleaning an infant's oral cavity, but it was statistically significant (Chi square test p=0.034 - Indicating statistically significant).

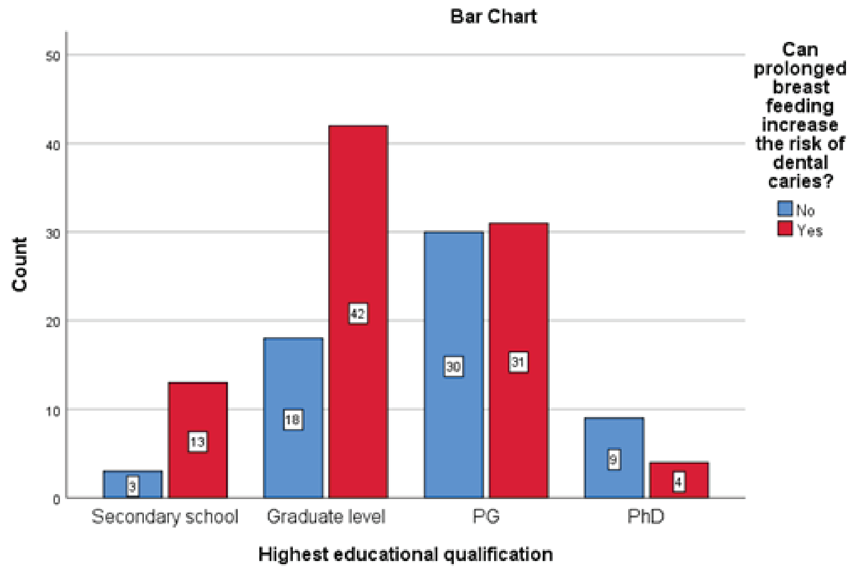

Figure.3- Bar graph showing comparison of responses between highest educational qualification and relation between breastfeeding and caries. X-axis represents the highest educational qualification of parent and y-axis represents the number of parents who responded. Blue colour represents no and red colour yes. Graduate level educated parents showed more awareness (42) on the relation between breastfeeding and caries, comparison was statistically significant (Chi square test p=0.006 - Indicating statistically significant).

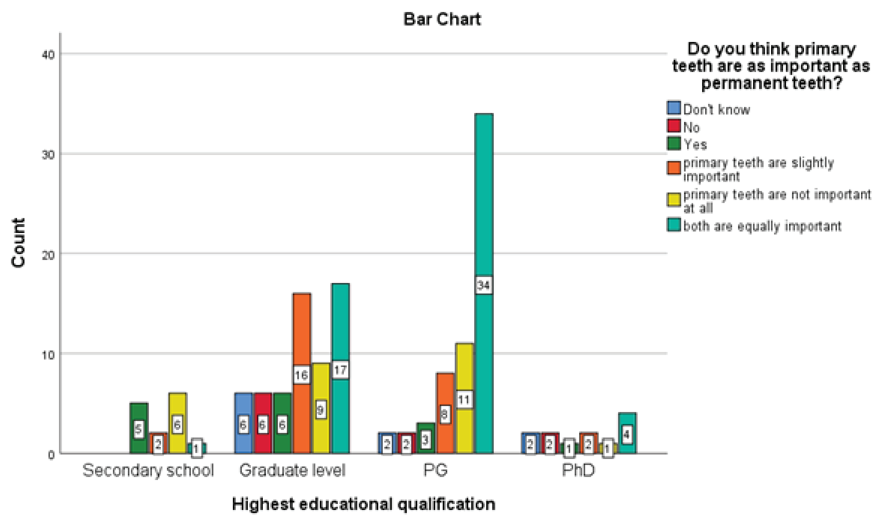

Figure.4- Bar graph showing comparison of responses between highest educational qualification and importance of primary and permanent teeth. X-axis represents the highest educational qualification of parent and y-axis represents the number of parents responded. Blue colour represents Don't know, red colour represents No, green colour represents Yes, orange colour represents primary teeth are slightly important, yellow colour represents primary teeth are not important at all and teal colour represents both are equally important. PG level educated parents showed more awareness (34) on the importance of primary and permanent teeth, and comparison was statistically significant (Chi square test p=0.001 - Indicating statistically significant).

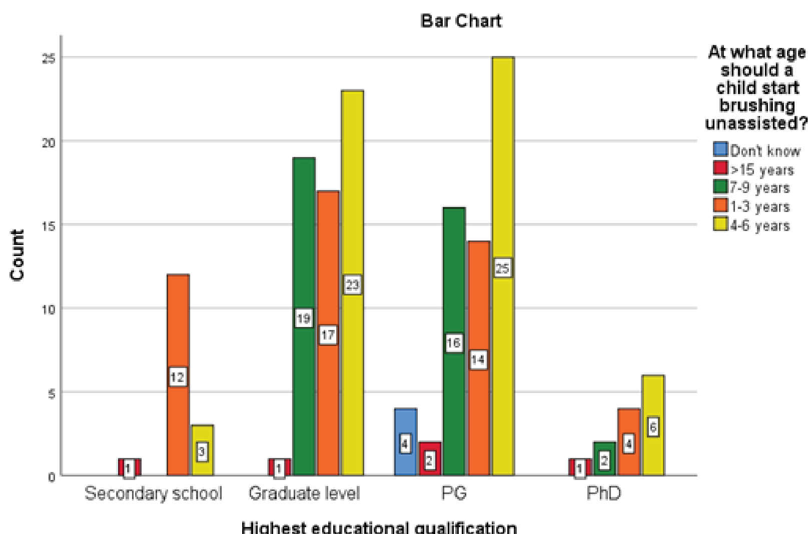

Figure.5- Bar graph showing comparison of responses between highest educational qualification and association between age and unassisted brushing. X-axis represents the highest educational qualification of parent and y-axis represents the number of parents who responded. Blue colour represents Don't know, red colour represents >15 years, green colour represents 7-9 years, orange colour represents 1-3 years and yellow colour represents 4-6 years. PG level educated parents showed more awareness (25) on association between age and unassisted brushing, but it was not statistically significant (Chi square test p=0.060 - Indicating statistically not significant).

On collecting and analysing the results obtained, it was found that 25.2% of the population belonged to the age group 30-39 years and 41.1% of the population had a highest educational qualification of PG level. 21.33% of the parents belonged to the income group ranging from 75000-100000 Rs

51.3% of the parents felt that an infant's first dental visit should be within 6 months of the eruption of the primary tooth. 40.67% of parents had chosen to clean an infant's oral cavity with wet cotton and 76.67% that the infant's tooth development affects the general health. 22% of the parents felt that knowledge on the teeth development rates were unnecessary and 44.67% that various parafunctional habits can lead to irregular infant teeth. 20.67% of parents felt that genetics and development of primary teeth were unlinked. 60% were aware that prolonged breast feeding can lead to dental caries and 66.67% that malocclusion can be caused by the early loss of milk teeth. 61.33% of parents opted that good oral hygiene can prevent ECC and 38.36% that both primary and permanent teeth are equally important . 54.36% that an infant's tooth develops before 1 year and 55.33% choose that cleaning should occur when all the first milk teeth have erupted. 54.67% chose that pea size amount of toothpaste should be used to clean the infant's tooth . 38% of parents chose that a child should start brushing unassisted between 4-6 years of age and 74.67% that food was related to oral health. 66.675 of individuals felt that sugar consumption was related to oral hygiene and 68.67% that frequency of sugar consumption had a greater impact than amount of sugar consumed. 66.67% voted that retentiveness of food in the oral cavity was linked to caries. 67.33% were aware that fluoride could prevent caries and 88.67% that parent knowledge had to be improved. (Table 1)

On comparing the levels of awareness based on the highest educational qualifications among 150 South Indian parents, the following results were obtained. 31 Post-graduate level educated students had chosen that an infant's first dental visit should be within 6 months of the eruption of the first tooth (Figure.1) and 10 post graduate level parents felt that an infant's oral cavity must be cleaned with wet cotton and toothpaste (Figure.2) 50 postgraduate level parents voted that infant's teeth development affects general health. 48 post graduate level parents chose that parent knowledge

on development rates were essential and 28 postgraduate level parents that parafunctional habits can cause irregular teeth. 49 graduate level educated parents agreed that genetics affects tooth development and 42 graduate students that prolonged breast feeding can lead to an increased risk of dental caries (Figure.3). 41 graduate level educated level parents voted that early loss of milk teeth can cause potential malocclusion. 16 postgraduate level of education parents opted that anti-caries vaccine can prevent ECC and 34 of them voted that both primary and permanent teeth were essential (Figure.4).

35 post graduate level educated parents believed that the kid's first teeth begin to erupt before 1 year of age and 35 of them responded that cleaning of infant's teeth should begin when the 1st milk tooth erupts and 35 of the postgraduate level parents that a pea size amount of toothpaste should be used for cleaning. 25 post graduate level educated parents believed that 4-6 years was the ideal age for a child to start brushing unassisted (Figure.5). 46 graduate level educated parents felt that food was related to oral health while 41 of the postgraduate level educated parents felt that sugar consumption affects oral hygiene. 42 post graduate level educated parents were aware that retaining of food in the oral cavity was associated with caries and 42 post graduate educated parents knew that fluoride helps in preventing dental caries.

51.33% of the parents responded that an infant's first dental visit should be within 6 months of the eruption of the first tooth, 26.67% for immediately after birth and 22% for whenever necessary. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate educated parents (20.66%) had chosen the correct answer i.e. within 6 months of eruption of first teeth. (Figure.1) The p value was found to be 0.096 which was statistically not significant.

40.67% of the parents chose to use wet cotton for cleaning the infant's oral cavity, 22% for dry cotton, 15.33% for soft toothbrush and toothpaste and 14% for cotton and toothpaste. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate educated parents (6.67%) had chosen the correct method of cleaning i.e. with cotton and toothpaste. (Figure.2) The p value was found to be 0.034 which was statistically not significant.

76.6% of the parents were aware that an infant's tooth development affects general health and 23.3% that it doesn't. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate educated parents (33.33%) had opted for the correct answer that infant's tooth development affects general health. The p value was found to be 0.104 which was statistically not significant. Similar results were obtained by Adimoulame, et al with 70% of the population who agreed for the same [26]. Overall, it can be inferred that most of the parents were aware that infant's tooth development affects general health.

78% of the parents felt that development rates of infant's teeth was essential and 22% that it was unnecessary . On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate educated parents (32%) had opted for the correct answer that development rates of an infant's teeth were essential. The p value was found to be 0.405 which was statistically not significant.

19.3% of parents felt that mouth breathing can lead to irregular teeth, 36% for thumb sucking and tongue thrusting and 44.67% for both. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of graduate educated parents (19.33%) choose the correct option i.e. all of the above. The p value obtained was 0.137 which was statistically not significant. Similar results were obtained by P.M. Castelo, et al with 34.3% on parafunctional habits [27]. In general, it can be inferred that the majority of the parents were fully aware that parafunctional habits such as the above could cause irregular teeth.

79.33% of parents were aware that genetics affects primary teeth development and 28.67% were unaware. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of graduate educated parents (32.67%) had chosen the correct answer that development rates of the teeth are affected by genetics. The p value obtained was 0.331 which was statistically not significant.

60% of the parents knew that prolonged breast feeding practice can increase the risk of caries and 40% were unaware of this fact. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of graduate educated parents (28%) had correctly opted that prolonged breast feeding practices could lead to dental caries. (Figure.3) The p value was found to be 0.006 which was statistically significant.

66.67% of the parents were aware that early loss of milk teeth can lead to malocclusion of permanent teeth and 33.33% were unaware. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of graduate educated parents (27.33%) correctly chose that malocclusion could potentially be due to the early loss of milk teeth. The p value was found to be 0.428 which was statistically not significant. Similar results were obtained by A. Sanguida, et al with 77%. The above results lead us to the inference that most of the parents were aware that malocclusion has a direct relation with the early loss of milk teeth.

20.67% of the parents felt that anti-caries vaccines can prevent ECC, 61.33% for good oral habits and 18% for both . On comparing parents of different educational levels, through chi square test, it was found that the maximum number of graduate educated parents (27.33%) had correctly opted for both anti caries vaccine and good oral habits as methods of prevention of ECC. The p value was found to be 0.121 which was statistically not significant. Similar results were obtained by S.A. Mani with 53% for good oral hygiene [28]. Overall, it can be inferred that good oral hygiene can prevent early childhood caries which most of the parents were aware of.

19.18% of parents felt that primary teeth are slightly important, 18.49% that primary teeth are not important. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of graduate educated parents (22.67%) had chosen the correct answer i.e. that primary and permanent teeth are equally important. (Figure.4) The p value obtained was 0.001 which was statistically significant. Similar results were obtained by A. Alsheri with 62.63% agreeing that both primary and permanent teeth are essential. From the above discussion, it can be inferred that the awareness level of importance of primary and permanent teeth among parents were high.

28.65% of the parents chose that the kid's first teeth begin at 1 year, 2.68% of the parents for second year, 7.38% for third year. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate educated parents (23.33%) had chosen the correct answer i.e. less than a year for emergence of the child's first tooth. The p value obtained was 0.098 which was statistically not significant.

15.33% of parents begin to clean a child's teeth when the first permanent teeth erupt, 25.33% when all the milk teeth have erupted, 55.33% when the first milk tooth erupts. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of graduate educated parents (25.33%) had chosen the correct answer i.e. cleaning of oral cavity should commence when the infant's first milk tooth erupts. The p value was 0.0483 which was statistically not significant. Similar results were obtained by A. Alsheri, et al with 63.34% for when milk teeth start to erupt. Overall, the inference obtained can be stated that the awareness of cleaning an infant's oral cavity was quite low.

17.33% of parents chose to use toothpaste for half the length of the toothbrush, 24% for bean sized and 54.67% for pea size. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate educated parents (23.33%) had chosen the correct answer i.e. pea sized amounts of toothpaste for cleaning. The p value obtained was 0.171 which was statistically not significant. Similar results were obtained by A. Sanguida, et al with 45% for pea size. It can be inferred that most of the parents were aware of the amount of toothpaste to be used while cleaning an infant's oral cavity.

3.33% of parents choose above 15 years for a child to brush unassisted, 24.67% for 7-9 years, 31.33% for 1-3 years and 38% for 4-6 years. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate educated parents (16.67%) had chosen the correct answer i.e. 4-6 years was the ideal age for unassisted

brushing. (Figure.5) The p value obtained was 0.060 and was statistically not significant. Similar results were obtained by Adimoulame Sanguida, et al with 46.8% for 4-8 years. Overall, it can be inferred that the majority of the parents were aware of the ideal age for unassisted brushing in children.

74.76% of the parents felt that food affects oral health and 20.67% that food doesn't affect oral health. Chi square analysis proved that On comparing parents of different educational levels, through chi square test, it was found that the maximum number of graduate educated parents (30.66%) had chosen the correct answer i.e. food affects oral health. The p value was found to be 0.641 which was statistically not significant. Similar results were obtained by A. Alsheri, et al with 56.2%. The above discussion obtains an inference that most of the parents were aware of the relation between food and oral health.

68.67% of parents were aware that sugar consumption affects oral hygiene and 22.67% that it doesn't. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate educated parents (27.33%) had chosen the correct answer i.e. sugar consumption was related to oral health. The p value was found to be 0.954 and was statistically not significant. Similar results were obtained by A. Alsheri, et al with 95.4%. The inference obtained shows that a majority of the parents were aware of the ill effects of sugar consumption on oral hygiene.

68.67% of the parents felt that frequency of sugar consumption affected caries and 22.67% that it doesn't. On comparing parents of different educational levels, through chi square test, it was found that equal number of graduate and postgraduate educated parents (27.33%) had chosen the correct answer i.e. frequency of sugar consumption affected caries. The p value was found to be 0.492 which was statistically not significant. Similar results were obtained by A. Sanguida, et al with 92.4%. Overall, it can be inferred that most of the parents were aware that sugar consumption is linked to dental caries.

66.67% of parents felt that food in the oral cavity was linked to caries and 26% disagreed with this statement . On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate educated parents (42.6%) had chosen the correct answer i.e. food retained in the oral cavity is linked to dental caries. The p value was found to be 0.775 which was statistically not significant. Similar findings were obtained by A. Alsheri with 92.2%. The inference obtained shows that a majority of the parents were aware that food retained in the oral cavity can lead to caries.

67.33% of parents felt that fluoride can prevent dental caries and 22.67% that fluoride does not prevent dental caries . On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate educated parents (28%) had chosen the correct answer i.e. fluoride can prevent dental caries. The p value was found to be 0.068% which was statistically not significant. Similar results were obtained by A. Sanguida, et a lwith 25.7%. Overall, most of the parents were aware that fluoride plays a major role in prevention of dental caries.

88.67% of parents felt that there was a need to improve parent knowledge on infant oral and 11.33% that there wasn't a need. On comparing parents of different educational levels, through chi square test, it was found that the maximum number of post graduate eșducated parents (36.67%) had chosen the correct answer i.e. there was a need to improve parent knowledge on infant oral health care. The p value was found to be 0.945 which was statistically not significant.

The present study however suffered a limitation due to less number of sample size and a homogenous population. The study provides a scope to improve the knowledge among parents particularly the secondary school level educated parents.

Conclusion

The present study concluded that the post graduate parents had the highest awareness level among infant oral health and the secondary school level educated parents had the least knowledge on the same. Among the South Indian population, there exists a moderately high level of awareness on the infant oral health practices and early childhood caries. Dental assessments for infants, even before the eruption of the primary teeth is extremely essential as it helps in the detection of Early Childhood Caries which if left untreated can complicate to various dental diseases.

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Conflict of Interest: The author declares that there was no conflict of interest in the present study.

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Ethical Clearance: It is taken from "Saveetha Institute Human Ethical Committee" (Ethical Approval Number- SDC/SIHEC/2020/DIASDATA/0619-0320)

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