Comparison of knowledge between Italian and Spanish parents about the oral health of their preschool children



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Abstract

Aim To evaluate and compare baseline knowledge between Italian and Spanish parents with regards to the oral and dental health of their preschool children.

Study design epidemiological descriptive observational cross-sectional study.

Methods The research data was collected through an anonymous bilingual survey, generated through Google Forms and distributed either in paper form or through several digital channels together with a QR code to drive the participants to the questionnaire. In order to assess the differences between Italy and Spain, t-Student (with confidence interval) or Mann-Whitney tests were used to compare the independent numerical variables, and the Chi-Square test was used to compare the independent categorical variables.

Results A total sample of 507 surveys was obtained, 253 filled by Italian and 254 by Spanish parents. The difference in the level of knowledge between Italian and Spanish parents was statistically significant (p= 0.001). Spanish parents obtained a higher rate (67%, SD= 4.47) as compared to the Italian ones (62%, SD= 3.90). Also, 54.5% of Italian parents and 44% Spanish parents reported that they had never received instructions on how to brush their children's teeth. It was found that 56% of parents in Italy, and 40% in Spain had never taken their preschool children to the dentist. Additionally, 77% of Italian preschoolers and 54% of their Spanish counterparts brush with a toothpaste containing less than 1000 ppm fluoride and, approximately 28% of Italian and Spanish parents did not start brushing their childrens' teeth until the complete eruption of their deciduous teeth (approximately 2.5–3 years).

Conclusions Independently of the differences identified among the two countries, the results show that parents from both nationalities have limited knowledge about their preschool children's oral health and are not fully informed about child's oral hygiene practices.

KEYWORDS Preschool children, Dental caries, Health knowledge, Parents.

Introduction

Oral diseases in children can appear from the eruption of the first primary tooth, so it is important to educate the family on prevention as well as on the treatment of dental diseases [ElKarmi et al., 2015; Vozza et al., 2017]. Dental caries or tooth decay is the most common dental disease and constitutes a global public health problem, affecting 97% of the population worldwide. It is the most common chronic childhood disease, with a high prevalence among preschoolers [Phantumvanit et al., 2018; WHO Oral Health Team, 2019].

Despite a growing awareness of the importance of children's oral health, many parents and/or caregivers do not follow good dental practices with their children, often due to a lack of knowledge or inappropriate overprotection [Hill et al., 2019]. However, it is well-known that parental knowledge, attitude, and practices can have an impact on the children's oral health [Suresh et al., 2010; Chhabra and Chhabra, 2012; Alkhtib and Morawala, 2018, RajavaaRa et al., 2018]. Therefore, family should be the main learning source for children, through which they acquire the habits and good practices that will determine their future oral health. In this line, children under the age of six acquire their routines and habits at home, where they generally spend most of their time [Hill et al., 2019] during their early years of "primary socialisation".

Many times, children's oral health might reflect their parents' knowledge and attitude towards dietary and oral hygiene practices. Past studies [Saied-Moallemi et al., 2006, Cianetti et al., 2017] have revealed that low parental knowledge and poor attitudes towards oral health are associated with higher numbers of caries in infants and young children. Furthermore, it has been found that parents' positive attitude towards dentistry also has a positive impact on their children's dental health [Smith et al., 2020]. In addition to the knowledge that either parents or caregivers may have, a good communication with a paediatric dentist will also enhance further preventive actions in the future [Alkhtib and Morawala, 2018].

Education on controlling the risk factors should be offered not only to parents and family members, but should be also present

in all environments surrounding the child. Such education should begin as early as possible, ideally during the pregnancy stages and the first early years [Moynihan et al., 2019; WHO Oral Health Team, 2019; Smith et al., 2020].

Numerous studies [Dincer et al., 2009; Suresh et al., 2010; Chhabra and Chhabra, 2012; ElKarmi et al., 2015; Alkhtib and Morawala, 2018; Calcagnile et al., 2019] have evaluated the parents' knowledge about their children's oral health, but always focused on a single country. Spain and Italy have many similarities at social and cultural level. According to the literature, the oral health situation of preschool children is also similar in both countries. In Spain, up to 73% of children under the age of 3 have never visited the dentist, 70% of parents do not supervise tooth brushing of their children under 6 years, 31% of children under 6 years have cavities, and only 10–20% of tooth decay in primary teeth receive proper treatment [Consejo General de Odontólogos y Estomatólogos de España, 2019]. On the other hand, in Italy, 60% of children under the age of 2 have never visited the dentist, 57% of parents do not supervise tooth brushing of their children under 6 years, and prevalence of caries in preschoolers is near 8.2% overall, 2.9% in children aged 0–23 months, 6.2% in children aged 24–47 months, and 14.7% in children aged 48–71 months [Colombo et al., 2019].

Knowing the habits and lifestyles of preschoolers and their families are essential for paediatric dentists in order to identify risk factors and implement appropriate strategies to improve and establish good healthy habits [WHO Oral Health Team, 2019]. Consequently, the aim of this research was to evaluate and compare the basic knowledge between Italian and Spanish parents regarding the oral and dental health of their preschool children.

Materials and methods

A descriptive cross-sectional observational study was approved by the Ethics Committee of the Universitat Internacional de Catalunya (UIC), Barcelona, Spain (Approval Reference: ODP-ECL-2020-04) in October 2020 and was conducted in the Department of Paediatric Dentistry of the UIC between November 2020 and January 2022.

The parameters used for the sample size calculation were a risk of 5% and a statistical significance of 80%. A standard deviation (SD) of 2.5 was assumed and a loss rate of 20% was estimated in order to detect the difference equal to or greater than 1 point in each country. A minimum of 98 surveys were set up as a threshold in each country.

The research data was collected through an anonymous bilingual survey, generated through Google Forms and distributed either in paper form or through several digital channels together with a QR code to drive the participants to the questionnaire. The surveys were circulated to parents with children under 6 years of age, both randomly as well as in specialised centres such us the paediatric dentistry area from the Universitat Internacional de Catalunya (UIC) in Barcelona (Spain) and the Istituto Stomatologico Italiano (ISI) in Milan (Italy). The inclusion criteria was defined as follows: mothers and fathers of preschool children (12–72 months old) who completed the survey and were residents either in Italy or Spain. The only exclusion criterion was the refusal to participate in the survey.

Parents who received the survey were requested to complete a comprehensive multiple choice questionnaire composed by a set of preselected questions based on oral health's papers and literature [Dincer et al., 2009; Chhabra and Chhabra, 2012; ElKarmi et al., 2015; Alkhtib and Morawala, 2018; Calcagnile et al., 2019]. Followed by a first section of demographics, the questionnaire consisted of 32 multiple choice questions related to the parents' knowledge of children's oral health and divided into five sections: parents' knowledge of oral hygiene, parents' attitude towards medical professionals, parents' knowledge about caries and their prevention, children's habits and children's diet (Table 1). In the survey, 28 questions were scored, allowing participants to select only one option from the list of responses. The correct answers scored 1 point each, reaching a maximum of 28 points to reflect the level of parental knowledge and to compare the results between the two countries. There were also four non-scored questions in order to obtain relevant data about the habits from both children and their families. These unscored questions were number 2, 4, 8 and 10 as referred in Table 1.

Statistical analysis was performed with the R Version 4.1.1 (R Foundation for Statistical Computing, Core Team, Vienna). To assess the normality of the sample, the Kolgomorv-Smirnov

SECTION I · Parents' knowledge of oral hygiene
1. When did you start brushing your child's teeth?
2.Type of brush used by your child.
3. How many times does your child brush his/her teeth?
4. How long does it take your child to brush his/her teeth?
5. What do you do while your child brushes his/her teeth?
6. What is preventing you from brushing your child's teeth?
7. Have you ever received instructions on how to brush your child's teeth?
8. What age the toothpaste that your child uses is meant for?
9. How much fluoride does your child's toothpaste contain?
10. Doos your child know how to spit out the remaining toothpaste?
11. How much toothpaste should be put on the brush?
12. Does your child rinse with water after brushing?
SECTION II · Parents' attitude towards professionals
13. Have you ever taken your child to the dentist?
14. At what age did you first take your child to tho dentist?
15. Do the parents go to the dentist regularly?
16. How is your oral health?
17. Did you go to the dentist during your pregnancy?
SECTION III · Parents' knowledge of caries and prevention
18. Has your child cavities?
19. Should primary teeth be treated?
20. Does fluoride prevent caries?
21. Do you know what fissure sealants are?
SECTION IV · Children's habits
22. Does your child drink from baby bottles at night?
23. Does your child use a dummy to sleep?
24. Have you given your child a dummy soaked in a sugary substance?
SECTION V · Children's diets
25. Number of daily meals your child eats
26. Does your child eat between meals?
27. Child's consumption of sweets or candy
28. Child's fruit intake
29. Child's consumption of bottled juices or soft drinks
30· Consumption of sweetened dairy products
31. Habitual consumption of baked goods
32. What kind of bread does your child normally eat?

TABLE 1 Survey used in this research study.

	% ITALY	% SPAIN	% TOTAL	P-VALUE
Gender				
Female	90%	82%	86%	
Male	10%	18%	14%	0.011*
Age				
	average 38.76	average 38.17		0.144 NS
Marital status				
Single	6%	16%	11%	
Married	91%	79%	85%	
Divorced	4%	5%	4%	<0.001*
Level of studies				
Baccalaureate or less	17%	16%	16%	
Degree	53%	41%	47%	
Postdegree	30%	43%	37%	0.009*
Level of studies partner				
Baccalaureate or less	25%	27%	26%	
Degree	47%	40%	43%	
Postdegree	28%	33%	31%	0.002*
Number of children				
1	37%	32%	35%	
2	49%	45%	47%	
>2	14%	23%	18%	0.035*
Position of the child				
First	73%	60%	66%	
Second	19%	27%	23%	
Third	8%	10%	9%	
Other	0%	2%	1%	0.003*
Child's age				
	average 4.02	average 3.55		<0.001*
Child's gender				
Boy	55%	54%	54%	
Girl	45%	46%	46%	1 NS

**Statistically significant (P<0.05). NS = Nonsignificant value (P>0.05).*

TABLE 2 Study Demographics.

test was performed. To describe quantitative variables, mean and standard deviation were calculated for normal variables, and median and quartiles for not normal variables. To describe qualitative variables, frequency and percentage were calculated. To test differences between Italy and Spain, t-Student (with confidence interval) or Mann-Whitney tests were used to compare the independent numerical variables, and the Chi-Square test was used to compare the independent categorical variables. A p-value of 0.05 and a 95% reliability level were considered statistically significant.

Results

Demographics

A total sample of 507 completed questionnaires were obtained, 253 in Italy and 254 in Spain. Of those completing the survey, 86% were female and 14% were male. With regards to their education levels, both countries presented similar outcomes, nearly 78% having at least a bachelor's degree. The average age of Italian and Spanish parents was 38.76 (SD=4.87) and 38.17 (SD=4.18) years, respectively (p= 0.144). In Italy, the average number of children per couple was 1.80 children (SD=0.77), while in Spain the average was 1.95 children (SD=0.83), with a statistically significant difference (p=0.035) between the two countries. Regarding marital status, in Italy there were 91% married couples, while in Spain the percentage was 79% (p<0.001). Gender wise, both countries presented a similar distribution of males and females children involved in the study (p = 1). In Italy, the children's median age was 4.02-year old (SD=1.50) and 3.55-years old (SD=1.65) in Spain (p<0.001). Study demographics are showed in Table 2.

Parents' level of knowledge

Out of 28 questions, Italian parents scored an average of 17.45 (SD=3.90, 62%), while in Spain the average was 18.65 (SD=4.47, 67%). Therefore, the outcomes showed a statistically significant difference (p=0.001) between the level of knowledge from the two countries (Table 3). The study also revealed an association between the level of education and the level of oral health knowledge in both countries (Table 3). Parents with a higher level of education than a bachelor's degree, also had a higher level of oral health knowledge about their preschool children. In this sense, the average for the group of parents with higher level of education was 18.78 (SD= 4.12) in Italy and 19.82 (SD= 4.21) in Spain. On the other hand, the average for the group with lower level of education was 16.53 (SD=3.60) and 16.75 (SD=4.69) in Italy and Spain respectively, showing a difference of more than two points in Italy and three points in Spain when comparing these two groups. Analysis of variance (ANOVA) was also calculated to observe the differences in the means of the three groups of education levels. In Italy and in Spain the Anova p-value was statistically significant (Table 3).

Parents' knowledge of oral hygiene

According to the results, approximately 70% of the Italian and Spanish parents began to brush their children's teeth when the first primary tooth erupted. In both countries, approximately 28% of them did not start brushing their children's teeth until they had all their deciduous teeth erupted (approximately 2.5-3 years). Finally, the results also showed that 2% of Italian and Spanish parents had not started to brush their children's teeth yet. The outcomes obtained between the two countries did not show a statistically significant difference (p=0.492).

The survey revealed that 75% of Spanish preschool children use manual toothbrushes, while in Italy this percentage dropped to 62%. Also, 23% of children aged 1–6 years in Italy and 15% in Spain combined manual and electric toothbrushing. In this case, the difference was statistically significant (p=0.01). The same can be said with regards to the dental brushing frequency (Fig. 1), showing a statistically significant difference (p=0.005) with 64% of Italian parents and 48% in Spain stating that their

	ITALY		SPAIN		COMPARATION T-Student	
	Mean (dt)	p-value 1	Mean (dt)	p-value 1	Dif. (I.C)	p-value
GLOBAL	17.45 (3.90)	0.022*	18.65 (4.47)	0.003*	1.20 (0.47, 1.93)	0,001*
LEVEL OF STUDIES						
High school or less	16.53 (3.60)	0.219 NS	16.75 (4.69)	0.222 NS	0.22 (-1.62, 2.05)	0,816 NS
Bachelor's degree	16.98 (3.70)	0.011*	18.15 (4.34)	0.124 NS	1.17 (0.12, 2.22)	0,029*
Post degree	18.78 (4.12)	0.99 NS	19.82 (4.21)	0.059 NS	1.04 (-0.18, 2.26)	0,095 NS
ANOVA P-VALUE	0,001*		<0,001*			

**Statistically significant (P<0.05). NS = Nonsignificant value (P>0.05).*

TABLE 3 Global score for Italy and Spain and stratified by the variable level of studies.

preschool children brushed twice a day or more.

In Italy 23% of parents and 18.5% in Spain declared not checking their children's toothbrushing or being not present at the time of brushing, showing a statistically significant differences between the countries (p=0.035). The most frequent reason stated in both countries was the child's lack of cooperation, according to 25% of the parents. In addition, 54.5% of Italian parents and 44% in Spainish ones indicated that they had never received instructions or information on how to properly brush their children's teeth.

The majority of parents in both countries, 83% in Italy and 72% in Spain, used toothpaste commercially classified according to their children's age, i.e., for children under 6 years of age. Additionally, 77% of Italian preschoolers and 54% in Spainish ones declared brushing with a toothpaste with less than 1000 ppm fluoride or fluoride-free toothpaste, showing statistically significant differences between the two countries (p<0,001) (Fig. 2). The results showed that 90% of Italian parents and 93% of Spanish parents know the correct amount of toothpaste recommended for their children. In Italy and Spain, 75% and 51% of children respectively rinsed with water after brushing their teeth, being the difference between the two countries also statistically significant (p<0.001).

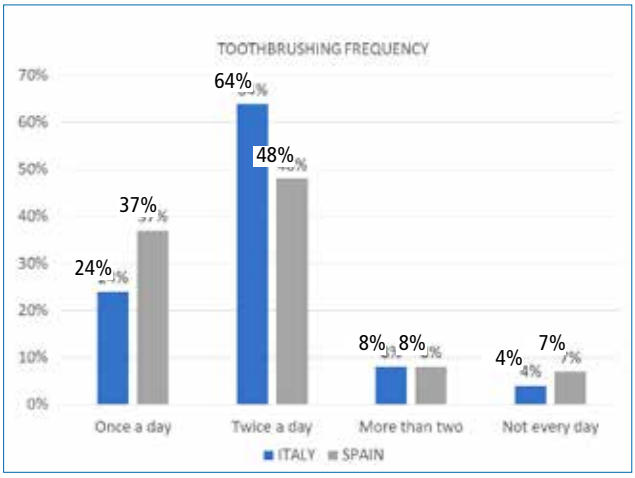


FIG. 1 Diagram of brushing frequency for children in both countries.

Parents' attitude towards dental professionals

The majority of parents (77%) from both countries declared to visit the dentist once a year. In Italy, 92% of them reported good or very good oral health compared to 94% of Spanish parents (p=0.438). Among women who participated in the study, 51% from Italy and 54% from Spain declared to have visited the dentist during their pregnancy stages, being this difference statistically significant (p=0.027).

It was also found that 56% of parents in Italy and 40% in Spain had never taken their preschool children to the dentist. Of those who did, 28% in Italy and 43% in Spain, visited a

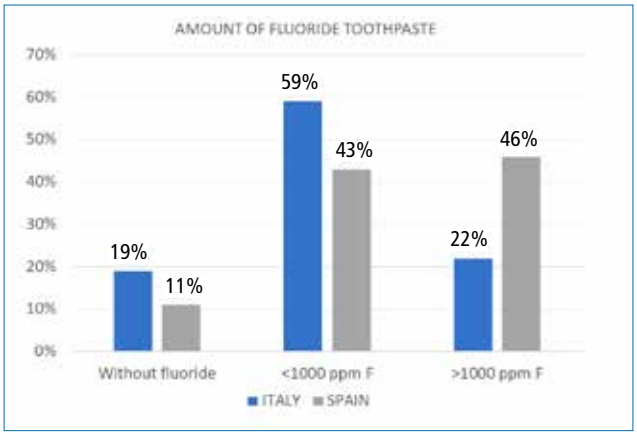


FIG. 2 Comparison of ppm fluoride in Italian and Spanish children toothpaste.

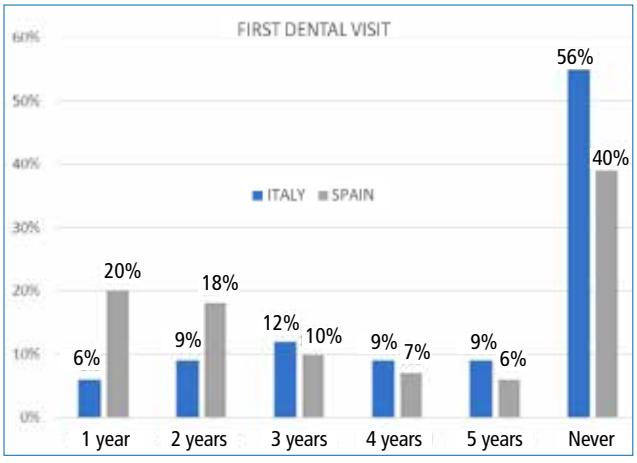


FIG. 3 Age of children's first dental visit in Italy and Spain.

	ITALY	SPAIN	P-VALUE
Number of daily meals			0.001*
3	2 (1%)	6 (2.5%)	
4	77 (30%)	42 (16.5%)	
5	159 (63%)	183 (72%)	
> 5	15 (6%)	23 (9%)	
Does your child eat between meals?			1.000 NS
Yes	117 (46%)	117 (46%)	
No	136 (54%)	137 (56%)	
Child's fruit intake			0,148 NS
Once a day	200 (79%)	214 (84%)	
2-4 days a week	41 (16%)	35 (14%)	
Occasionally/Never	12 (5%)	5 (2%)	
Consumption of sweets or candies			<0,001*
Once a day	47 (19%)	10 (4%)	
2-4 days a week	57 (22%)	70 (28%)	
Occasionally/Never	149 (59%)	174 (68%)	
Consumption of bottled juices or soft drinks			< 0,001*
Once a day	29 (12%)	7 (3%)	
2-4 days a week	55 (22%)	29 (11%)	
Occasionally/Never	169 (66%)	218 (86%)	
Consumption of sweetened dairy products			0,023*
Once a day	28 (11%)	46 (18%)	
2-4 days a week	83 (33%)	93 (37%)	
Occasionally/Never	142 (56%)	115 (45%)	
Consumption of baked goods.			<0,001*
Once a day	79 (31%)	25 (10%)	
2-4 days a week	85 (34%)	103 (40%)	
Occasionally/Never	89 (35%)	126 (50%)	
Kind of bread			<0,001*
Sliced bread	110 (43%)	63 (25%)	
Baguete style bread	114 (45%)	172 (68%)	
Milk bread	29 (12%)	14 (5%)	
Brioche bread	0 (0%)	5 (2%)	

**Statistically significant (P<0.05). NS = Nonsignificant value (P>0.05).*

TABLE 4 Results on preschool children's diets in Italy and Spain.

specialised paediatric dentist, finding statistically significant differences between the two countries (p<0.001). The results showed as well that 6% and 20% of Italian and Spanish preschool children respectively, were taken to the first dental visit during their first year of life. The difference between the two countries is also statistically significant (p<0.001) (Fig. 3).

Parents' knowledge of caries and prevention

According to the results, 88% of Italian parents stated that caries in primary dentition should be treated while 12% believed that it should not. In the case of Spain, the great majority, 96% reported that caries in primary teeth should be treated as well. This difference between the two countries is statistically significant with p=0.001. Moreover, 29% of Italian parents did not believe that fluoride helps to prevent cavities while in Spain this figure drops to 16% (p=0.0008). Finally, 47% of Italian parents and 61% of Spanish parents did not know what a dental fissure sealant was (p=0.003).

Children's habits

According to the survey's outcomes, 11% of children aged between 1 and 6 years in Italy and 16% in Spain, were given baby bottles at night. Pacifiers were present in children over 2 years of age in Italy (12%) and Spain (10%). Approximately 4% of the Italian and Spanish parents declared to have offered sugar-coated pacifiers to their children. The results obtained between the two countries did not show a statistically significant difference neither in the use of the feeding bottle at night (p=0.201), nor in the use of pacifiers (p=0.841) or sugar-coated pacifiers (p=0.993).

Children's diets

Both countries showed a large percentage of preschool children (46%) who snacked between meals, leading to an increased risk of caries, without a statistically significant difference between the two countries (p= 1). On the other hand, a statistically significant difference was obtained in the consumption of main sugary products by preschool children (Table 4). Baked food and sweetened dairy products were the most consumed products by preschool children in both countries. Additionally, the results also showed that 21% of children in Italy and 16% in Spain, did not consume fruit on a daily basis.

Discussion

In the scientific literature, there are several studies [Dincer et al., 2009; Suresh et al., 2010; Chhabra and Chhabra, 2012; ElKarmi et al., 2015; Alkhtib and Morawala, 2018; Calcagnile et al., 2019] about the parents' knowledge of their children oral hygiene. However, to our knowledge, this is one of the few studies that makes this comparison between two different countries. Independently of the differences identified between the two countries, the results show that parents from both nationalities, Italian and Spanish, have limited knowledge about their preschool children's oral health. Other investigations [Chhabra and Chhabra, 2012; ElKarmi et al., 2015] also indicate that parents in general do not have sufficient information on how to maintain their children's oral health. Chhabra and Chhabra [2012] in India concluded that parents' knowledge and attitudes must increase in order to improve their children's oral health as well. In their study, they state that paediatric dentists and other health professionals should promote the awareness of oral hygiene, infant feeding, the importance of the primary dentition and dental caries prevention programmes. ElKarmi et al. [2015] in Ireland, concluded that the knowledge of parents with preschool children about oral and dental health is limited, and underlined the importance of having a basic knowledge of oral health. On the other hand, Dincer et al. [2009], and Alkhtib and Morawala [2018] in their respective studies conducted in New York and Qatar, concluded that the level of parental knowledge in these two cities was relatively good and acceptable. However, both studies also stated that there is still work to be done to provide families with a solid

education on oral hygiene practices and habits for the oral health care of their young children.

Oral health knowledge is usually impacted by the education levels of parents, as well as to the socio-economic condition of the family unit. Mishra et al. [2018] and Chen et al. [2020] both suggested that higher parental education levels were associated with higher levels of oral health knowledge, which was revalidated in our study. Interestingly, our findings showed a correlation between the level of education and the level of oral health knowledge (Table 3). Furthermore, Saied-Moallemi et al. [2006] showed that children of parents with a low level of education had more caries lesions than those with parents with a high level of education, both in the primary dentition and in the permanent dentition. Likewise, in the study conducted by Cianetti et al. [2017] caries presence was higher in children whose parents' educational level was lower.

Comparing the studies of Dincer et al. [2009] and Chhabra and Chhabra [2012], different results were observed regarding the frequency of brushing in children around the world. In New York [Dincer et al., 2009], 63.5% of parents stated that their children brushed twice a day, while in India [Chhabra and Chhabra, 2012] only 11.8% of preschoolers brushed at least twice a day. Also in the present research, the comparison about the frequency of brushing between Spain and Italy was statistically significant (p=0.005). In Italy, 64% of parents reported that their preschool children brush twice a day at least, while only 48% in Spain confirmed it. The American Academy of Pediatric Dentistry (AAPD, 2021) recommends starting to brush teeth from the eruption of the first primary tooth, twice a day; in the morning and at bedtime.

It is strongly recommended by both the WHO [WHO Oral Health Team, 2019] and the AAPD [2021] that children under 6 years of age should be supervised by an adult when brushing their teeth, using a soft toothbrush according to their age. In this research, 76% of parents from Italy and 81% in Spain declared that they daily check their children's brushing process while in previous investigations carried out in Europe, the results were much lower. ElKarmi et al. [2015] in Ireland, found that only 22% of parents supervised brushing of their preschooler children's teeth, and Leroy et al. [2011] in Belgium, found a percentage of 51% of parents who reviewed the brushing of their 3-year-old children, but this percentage decreased to 34% when the children were 5 years old.

According to the available scientific evidence, from the eruption of the first tooth, children should use a toothpaste containing at least 1000 ppm F (parts per million of fluoride) in an amount equivalent to a grain of rice when the child is 0–3 years, and pea-sized amount between 3 and 6 years of age. This strategy is one of the key factors in reducing the incidence of caries disease [AAPD, 2021; Hill et al., 2019; WHO Oral Health Team, 2019]. Even so, in our study we have found that 77% of preschoolers in Italy and 54% in Spain, still use toothpaste with less than 1000 ppm of fluoride. Similar results have been obtained by Buckeridge et al. [2021] in Australia, where half of the sample of children under the age of six, used a toothpaste with less than 1000 ppm fluoride.

The American Academy of Pediatric Dentistry [AAPD, 2021] as well as many independent studies [Moynihan et al., 2019; Viswanath et al., 2021] officially support the importance of a dental visit before the first birthday. In the present study it was found that nearly 50% of parents in both countries had never taken their preschool children to the dentist. Other investigations [Chhabra and Chhabra, 2012; ElKarmi et al., 2015] show much lower results in other parts of the world. Chhabra and Chhabra [2012] found that only 15.2% of parents knew that the child's first dental visit should occur before the child's first birthday. While the study by ElKarmi et al. [2015] found that very few parents (2.6%) were familiar with the "visit before the first birthday".

It is important to highlight that apart from providing oral health care to women in pregnancy stages, it is also critical to educate them about prevention, healthy eating habits and home oral hygiene habits, being beneficial for both themselves and for the future oral health of their children [Aiuto et al., 2020]. The present study shows that among women who participated in the survey, 41% from Italy and 28% from Spain declared not having visited the dentist during their pregnancy (p=0.027). Higher results were obtained by Aiuto et al. [2020] in Italy, where 63.6% of the participants did not have any dental checkups during pregnancy. This lack of health care and education presents a risk for pregnant women 's oral health (manifestation of dental pathologies) as well as for her unborn child (future eating habits and home hygiene) [Paglia et al., 2016; Cianetti et al., 2017].

According to Paoloantonio et al. [2019], infants have an inherent biological drive for sucking that can be satisfied through nutritive sucking (breast- and bottle-feeding), or through non-nutritive sucking objects (fingers, pacifiers, or toys). In this sense, relationships between prolonged duration of sucking habits and occlusal anomalies have been extensively studied [Paoloantonio et al., 2019, Lombardo et al., 2020]. In our study, the prevalence of prolonged duration of nutritive-sucking habits were 11% in Italy and 16% in Spain (p=0.201) for children between 1 to 6 years old who took feeding bottles at night, increasing the prevalence of Early Childhood Caries (ECC). In a different study with children aged 0–6 years, higher results were obtained with 47.2% of children using feeding bottles with milk at night [Colombo et al., 2019]. The AAPD [2021] encourages people to stop using baby bottles beyond 12 months. Furthermore, in our study, the prevalence of prolonged pacifier use in children over 3 years was 12% in Italy and 10% in Spain. In the same line, other studies showed higher results with a prevalence of 22% in Italy according to Paoloantonio et al. [2019]. The American Academy of Pediatric Dentistry recommends stop using pacifiers before 3 years old.

Finally, with regard to diet, our results highlight the large amount of food and beverages with a high sugar content consumed by Italian and Spanish children from a very early age (Table 4). The diet and consumption of drinks, containing free sugars, is the most important factor in determining the onset of early childhood caries [Paglia et al., 2016]. Parents have a great influence on children's eating habits, as these ones should decide the quantity and quality of food provided during this stage [Sheiham and James, 2015; Phantumvanit et al., 2018]. Therefore, it is in this period, from 1 to 6 years of age, that diet and beverage healthy practices are established, which impact on the prevention of negative health effects in later childhood and adulthood [Paglia et al., 2019].

This study has some limitations. The data reported cannot be generalised to the entire Spanish and Italian population since more quantitative and qualitative research studies on a larger sample and over a longer period would be essential for a better understanding about the parent's oral health knowledge and habits. Secondly, it would be very interesting to complement the parent's results with a direct examination of their children's mouth to define a caries index and its correlation with the parent's oral health knowledge. Another limitation was the lack of information about the household income levels from

the families who answered the survey, since this information was not included in our socio-demographic section, and therefore not evaluated in our analysis. Finally, we cannot forget the potential bias always present in online surveys on which participants may misunderstand the meaning of some questions or even not being fully honest when answering the questionnaire. This limitation might be overpassed by conducting these surveys in presence.

Conclusions

Both countries present a similar socio-demographic status. According to the outcomes of this study, Spanish parents have higher levels of knowledge about their children's oral health than parents in Italy. Independently of the differences identified among the two countries, the results obtained from this survey provide meaningful insights about the lack of oral health knowledge and education throughout respondent parents in both countries, regarding their preschool children's dental care and oral hygiene.

Parents in both countries do not know how much fluoride their children's toothpaste should contain neither the recommended age for their children's first dental visit.

A large percentage of mothers present in this study did not have any preventive dental checkup during pregnancy.

Sugar consumption is high in preschool children in both countries, being baked goods and sweetened dairy products the most consumed. Health professionals must contribute to provide parents with the appropriate information to adopt good oral hygiene and healthy eating habits during the early stages of the mother's pregnancy and during the first years of their children's lives.

References

› Aiuto R, Torchia V, De Giorgio S, Paglia L. Survey on women's awareness of the importance of oral hygiene during pregnancy for the health of the mother and her unborn child: Observational aepidemiological study. Eur J Paediatr Dent. 2020;21(1):55-60. doi:10.23804/ejpd.2020.21.01.11.

› Alkhtib A, Morawala A. Knowledge, Attitudes, and Practices of Mothers of Preschool Children About Oral Health in Qatar: A Cross-Sectional Survey. Dent J (Basel). 2018;6(4):51.

› American Academy of Pediatric Dentistry. Policy on early childhood caries (ECC): Consequences and preventive strategies.The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2021:81-4.

› Buckeridge A, King N, Anthonappa R. Relationships between parental education, choice of child dentifrice, and their children's caries experience. Int J Paediatr Dent. 2021;31(1):115-121.

› Calcagnile F, Pietrunti D, Pranno N, Di Giorgio G, Ottolenghi L, Vozza I. Oral health knowledge in pre-school children: A survey among parents in central Italy. J Clin Exp Dent. 2019;11(4): e327-e333.

› Chen L, Hong J, Xiong D, et al. Are parents' education levels associated with either their oral health knowledge or their children's oral health behaviors? A survey of 8446 families in Wuhan. BMC Oral Health. 2020;20(1):203.

› Chhabra N, Chhabra A. Parental knowledge, attitudes and cultural beliefs regarding oral health and dental care of preschool children in an Indian population: a quantitative study. Eur Arch Paediatr Dent. 2012;13(2):76-82.

› Cianetti S, Lombardo G, Lupatelli E, et al. Dental caries, parents' educational level, family income and dental service attendance among children in Italy. Eur J Paediatr Dent. 2017;18(1):15-18.

› Colombo S, Gallus S, Beretta M, et al. Prevalence and determinants of early childhood caries in Italy. Eur J Paediatr Dent. 2019;20(4):267-273.

› Consejo General de Odontólogos y Estomatólogos de España, 2019. Salud Oral 2019. Salud Oral en Cifras. [WWW Document]. URL https://saludoral2019.es/salud-oral-en-cifras/.

› Dincer E, Ligouri AL, Rayman S, Rivera A. Parental perceptions about children's oral health care and toothpaste in New York City neighborhoods. N Y State Dent J. 2009;75(2):44-48.

› ElKarmi R, Shore E, O'Connell A. Knowledge and behavior of parents in relation to the oral and dental health of children aged 4-6 years. Eur Arch Paediatr Dent. 2015;16(2):199-204.

› Hill BJ, Meyer BD, Baker SD, et al. State of Little Teeth Report. 2nd ed. Chicago, IL: Pediatric Oral Health Research and Policy Center, American Academy of Pediatric Dentistry; 2019.

› Leroy R, Jara A, Martens L, Declerck D. Oral hygiene and gingival health in Flemish pre-school children. Community Dent Health. 2011;28(1):75-81.

› Lombardo G, Vena F, Negri P, et al. Worldwide prevalence of malocclusion in the different stages of dentition: A systematic review and meta-analysis. Eur J Paediatr Dent. 2020;21(2):115-122.

› Mishra A, Pandey RK, Chopra H, Arora V. Oral health awareness in school-going children and its significance to parent's education level. J Indian Soc Pedod Prev Dent. 2018;36(2):120-124.

› Moynihan P, Tanner LM, Holmes RD, et al. Systematic Review of Evidence Pertaining to Factors That Modify Risk of Early Childhood Caries. JDR Clin Trans Res. 2019;4(3):202-216.

› Paglia L, Scaglioni S, Torchia V, et al. Familial and dietary risk factors in Early Childhood Caries. Eur J Paediatr Dent. 2016;17(2):93-99.

› Paglia L, Friuli S, Colombo S, Paglia M. The effect of added sugars on children's health outcomes: Obesity, Obstructive Sleep Apnea Syndrome (OSAS), Attention-Deficit/Hyperactivity Disorder (ADHD) and Chronic Diseases. Eur J Paediatr Dent. 2019;20(2):127-132.

› Paolantonio EG, Ludovici N, Saccomanno S, La Torre G, Grippaudo C. Association between oral habits, mouth breathing and malocclusion in Italian preschoolers. Eur J Paediatr Dent. 2019;20(3):204-208.

› Phantumvanit P, Makino Y, Ogawa H, et al. WHO Global Consultation on Public Health Intervention against Early Childhood Caries. Community Dent Oral Epidemiol. 2018;46(3):280-287.

› Rajavaara P, Laitala ML, Vähänikkilä H, Anttonen V. Survey of family-related factors of children treated under dental general anaesthesia. Eur J Paediatr Dent. 2018;19(2):139-144. doi:10.23804/ejpd.2018.19.02.08.

› Saied-Moallemi Z, Virtanen JI, Tehranchi A, Murtomaa H. Disparities in oral health of children in Tehran, Iran. Eur Arch Paediatr Dent. 2006;7(4):262-264.

› Sheiham A, James WP. Diet and Dental Caries: The Pivotal Role of Free Sugars Reemphasized. J Dent Res. 2015;94(10):1341-1347.

› Smith SR, Kroon J, Schwarzer R, Hamilton K. Parental social-cognitive correlates of preschoolers' oral hygiene behavior: A systematic review and meta-analysis. Soc Sci Med. 2020; 264:113322.

› Suresh BS, Ravishankar TL, Chaitra TR, Mohapatra AK, Gupta V. Mother's knowledge about pre-school child's oral health. J Indian Soc Pedod Prev Dent. 2010;28(4):282-287. doi:10.4103/0970-4388.76159.

› Viswanath S, Asokan S, Pollachi-Ramakrishnan G. First dental visit of children-A mixed-method approach. Int J Paediatr Dent. 2021;31(2):212-222.

› Vozza I, Capasso F, Marrese E, Polimeni A, Ottolenghi L. Infant and Child Oral Health Risk Status Correlated to Behavioral Habits of Parents or Caregivers: A Survey in Central Italy. J Int Soc Prev Community Dent. 2017;7(2):95-99.

› World Health Organization. Ending childhood dental caries: WHO implementation manual. World Health Organization (2019). https://apps.who.int/iris/handle/10665/330643. Licencia: CC BY-NC-SA 3.0 IGO.