GRADUATION PROJECT

Degree in Dentistry

Evaluation of food advertising on television and its relationship with caries prevalence in the pediatric population.

EMPIRICAL RESEARCH

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RESUMEN

Introducción: La influencia de la publicidad alimentaria en las preferencias y el consumo de alimentos podría contribuir a la prevalencia de la caries en la población pediátrica de niños españoles e italianos.

Objetivos: Evaluar la relación entre la publicidad televisiva dirigida a niños entre 3 y 19 años en España e Italia en 2025-2026 y la prevalencia de caries;

Metodología: Estudio observacional de la publicidad televisiva durante tres semanas en 2025 y 2026 (de 11:00 a 20:52) con un total de 448 anuncios observados en España e Italia;

Resultados: Del total de 448 anuncios emitidos, 152 (32%) estaban dirigidos a niños, y la mayoría de estos a niños varones de entre 13 y 19 años. En España, el 42% de los 212 anuncios estaban dirigidos a niños y en Italia, el 27% de los 236 anuncios observados estaban dirigidos a niños. Los anuncios de alimentos y bebidas representaron el 68% de la muestra total;

Conclusiones: El estudio sugiere que la publicidad televisiva de alimentos poco saludables puede desempeñar un papel importante en la configuración de las preferencias alimentarias de los niños y en el aumento del riesgo de caries dental tanto en España como en Italia. En general, los resultados ponen de relieve la importancia de combinar medidas reguladoras con estrategias preventivas que involucren a las familias, las escuelas y los profesionales de la salud bucodental para promover hábitos alimentarios más saludables en ambos países.

PALABRAS CLAVE

Odontología, pediatría, televisión, caries dentales.

ABSTRACT

Introduction: The influence of food advertising on food preferences and consumption could contribute to caries prevalence in the pediatric population among Spanish and Italian children;

Objectives: To evaluate the relationship between television promotions and caries prevalence in Spain and Italy, directed at children between 3 and 19 years old in 2025-2026;

Methods: Observational study of TV advertising during 3 weeks in 2025 and 2026 (11 am-20:52 pm) with a total of 448 advertisements observed in Spain and Italy;

Results: Out of the total of 448 advertisements conducted, a total of 152 (34%) food advertisements were directed to children, and the majority were aimed at male kids in the age group between 13 and 19. In Spain, 42% of 212 advertisements were directed to children, and

in Italy, 27% of 236 advertisements watched were directed to children.
Food and drink advertisements accounted for 68% of the total sample ;
Conclusions: The study suggests that television advertising of unhealthy foods may play an important role in shaping children's dietary preferences and increasing the risk of dental caries in both Spain and Italy. Overall, the findings highlight the importance of combining regulatory measures with preventive strategies involving families, schools, and oral health professionals to promote healthier eating habits in both countries.

KEYWORDS

Dentistry, pediatric, television, dental caries.

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1. INTRODUCTION

1.1 Dental Caries as a Public Health Problem

Dental caries is a chronic, infectious, multifactorial disease that affects people in the whole world, especially children(1,6). The World Health Organization (WHO) has recorded that 60–90% of children are affected by dental caries (1). Despite the use of dental treatments as a preventive approach, caries remains a significant public health issue because it is influenced by genetics, behavior, and environment (1,2). When cavities go untreated, the pain can affect kids' emotional state, sleep patterns, and learning skills. Although it occurs everywhere, its burden is not evenly spread. Rates vary by community and are often higher where families face social or economic disadvantage (1,3).

At the same time, the disease persists among the privileged population (3).

Calling caries “multifactorial” means there is not only one cause. Among all modifiable factors, diet has fundamental importance. Diet in early childhood has long-lasting effects and is strongly influenced by culture, family, and marketing (4).

1.2 Etiology of Dental Caries and the Role of Diet

Caries development results from a dynamic process involving the oral microbiota, dietary carbohydrates, saliva function, and oral hygiene. When sugars enter the mouth, cariogenic bacteria such as Streptococcus mutans convert them into acids that lower oral pH (4,5). Frequent exposure promotes enamel demineralization, so children who snack often on sweet, sticky foods or sip sugary drinks throughout the day face a higher risk (2,5).

Evidence presented by Grenby [1990] shows that not only sugary foods but also salty snacks lead to the acidification of the oral cavity (5). Moreover, sticky foods, such as industrial pastries or sweet cereals, maintain a critical low pH for longer periods (6).

According to Sheiman [2001], the maximum amount of sugar that children should consume per day is 30g. With the use of fluoride, the acceptable amount of sugar consumed increases to 60g per day(6). It has been observed since the 1970s that the use of fluoride toothpaste is a reasonable explanation for the decline in dental caries among children in many countries worldwide (7,8).

1.3 Caries Prevalence in Pediatric Populations

Globally, dental caries remains a persistent hurdle among children and has not been overcome. The World Health Organization reports that more than 530 million children suffer from dental decay in their primary teeth, underscoring the scale of this issue (7).

In Europe, despite widespread awareness and broad use of fluoridated toothpaste, the prevalence of dental caries in children remains a concern. Southern European countries, including Spain and Italy, present moderate to high levels of caries compared to Northern Europe, reflecting differences in dietary habits, socioeconomic distribution, and preventive public health strategies (2, 3).

1.4 Food Advertising Targeted at Children

Food is essential for healthy growth, but the types and frequencies of what children eat and drink strongly influence caries risk (6).

Children's food choices are influenced by many factors. Family resources, what foods are easy to buy, and the media messages they see all matter (2,4,8). Television advertising can be especially convincing when it uses child-friendly features such as cartoon characters, bright colors, and catchy music. Previous research indicates that excessive television viewing among children is associated with misconceptions about healthy eating, which, in turn, lead to increased intake of unhealthy foods (8).

The literature indicates that watching television is often accompanied by snacking. Reported "TV snacks" commonly include sweet items, salty snacks, and sugar-sweetened drinks. Families may also serve convenient foods during TV time, such as biscuits, breakfast cereals eaten as snacks, or sweetened yogurt. During the COVID-19 pandemic, Italian families increased their purchases of less nutritious, long-lasting foods to reduce social exposure, thereby affecting children's diets by altering the types of food available at home (9).

1.4.1 National advertising regulations

Television plays a role in shaping children's dietary behaviors — not only through viewing habits that encourage snacking, but also through food promotions that attract children across different media. In the European Union, food advertising is supposed to follow general guidelines such as the Audiovisual Media Services Directive (AVMSD) and the EU Pledge, which aim to restrain the promotion of foods high in sugar, salt, and fat to children. In Article 28, a general statement

explicitly states that the EU is asking countries and the media to establish practical guidelines to protect children from advertisements for unhealthy foods (10). However, compliance with the rules varies across the EU member states. In Italy, there is a general regulatory system controlling food advertisements aimed at children, IAP (Imprenditore Agricolo Professionale). This model contains only one rule specifically addressing food and drinks aimed at children: it says that advertising of food and beverages aimed at children must be clear, not misleading, and must not encourage them to adopt unhealthy eating habits (11). Spain has adopted the PAOS Code (Código de Corregulación de la Publicidad de Alimentos y Bebidas Dirigida a Menores, Prevención de la Obesidad y Salud en España), a self-regulatory scheme that governs the marketing of food and beverages directed at children under 15 (12). Although both systems share the goal of protecting children from harmful food advertising, they differ in their approaches: PAOS takes a public health perspective, while IAP adopts a more self-regulatory, advertising-focused perspective (11,12).

Given these differences, this study aims to analyze food advertisements in both countries, assess their compliance with health-based policies, and investigate their association with caries prevalence among the pediatric population.

The research focuses on two settings: Spain, where the work is being conducted, and Italy, my home country. Comparing these countries is useful because they share some cultural patterns yet differ in media markets, food environments, and broadcast schedules. In Europe, studies have found that more than 70% of advertisements aired during children's viewing hours promote unhealthy foods (13).

1.4.2 Target population

The target population is pediatric, but aiming as broadly as possible across age groups to reflect its reality.

The different age-range periods will allow the study to see whether younger viewers react more to visual cues, while older viewers respond more to brand identity and social messaging.

2. OBJECTIVE

The objective of this study is to investigate how exposure to food advertising influences the prevalence of dental caries in the pediatric population and to compare these patterns between

two countries: Spain and Italy. The comparison focuses on differences in advertising modalities and the nutritional quality of products promoted in television announcements.

3. MATERIAL AND METHODS

3.1 Study Design

This research uses a comparative descriptive table to examine the relationship between food advertising and caries prevalence among children in Italy and Spain. The study evaluates the types, frequency, and regulatory compliance of food advertisements targeted at children, and compares these findings with available epidemiological data on dental caries in both countries. The study was reviewed and validated by the Investigation Committee of the European University of Madrid with the code: OD.082/2526

The research was based on the formulated PICO question, where:

Population = *children living in Italy and Spain*

Intervention = *exposure to food advertising (television)*

Comparison = *advertising frequency and nutritional quality between the two countries*

Outcome = *prevalence of tooth decay in the pediatric population*

Finally, the guided Pico question was:

"In children living in Italy and Spain, how does exposure to food advertising, compared with differences in advertising patterns, relate to the prevalence of dental caries?"

3.2 Data Sources

Two categories of data were used:

1. Secondary epidemiological data, including the prevalence of dental caries in children, considering age groups between 3 and 19 years old, were obtained from peer-reviewed articles accessed through PubMed and MEDLINE (obtained through the University's digital library).
2. Primary data on television food advertising were collected through direct observation using a structured diary designed by the researcher. Television advertisements were observed and manually recorded, including the type of food advertised, the time of broadcast, the target audience, and marketing characteristics. This diary served as the main primary data collection tool for documenting children-directed food advertising.

Because access to commercial advertising databases was limited, and these databases are often restricted to advertising agencies or subscription-based users, the study relied on direct observation and on data available in published literature.

Because the most precise and foundational studies on this topic were conducted earlier, it was necessary to include several sources published more than ten years ago. Although these articles are not recent, they remain relevant because they provide essential evidence and more accurate information for understanding the subject.

3.3 Search strategy

A search strategy was used following the PICO framework. The various searches included combinations of keywords related to food marketing, children, dental caries, and the geographic contexts of Italy and Spain. Boolean operators (AND/OR) and key terms were used to refine the results.

The search equation was primarily developed using PubMed and MEDLINE. The following structured string was applied:

(“food advertising" OR "television advertising") AND ("children" OR "pediatric") AND ("Italy" OR "Spain") AND ("dental caries" OR "tooth decay" OR "oral health").

3.4 Inclusion and Exclusion Criteria

3.4.1 Inclusion Criteria

Studies were included if they:

- Examined food advertising directed at children
- Provided information on nutrition or classified advertised products
- Included data specific to Italy, Spain, or both
- Reported outcomes related to dental caries or contained relevant epidemiological indicators
- Were published in English, Italian, or Spanish

3.4.2 Exclusion Criteria

Studies were excluded if they:

- Focused only on adults
- Did not analyze advertising content
- Lacked nutritional or epidemiological data

- Were commentaries, editorials, or opinion pieces
- Were unrelated to food advertising or oral health

3.5 Data Collection and Extraction

A standardized data-extraction sheet was created for both the literature review and the primary observation diary.

For primary data collection, television advertisements were observed and recorded in a diary I completed.

For the secondary data collection, relevant studies were reviewed to extract available epidemiological indicators of dental caries prevalence by age group, as well as published findings on food advertising patterns in Italy and Spain

3.6 Data Analysis

Finally, the extracted information was summarized in tables comparing the two countries of interest to me: Italy and Spain. The following specific steps were included:

1. Classifying advertisements as children-directed food advertisements versus adult/non-children advertisements.
2. Describing advertising frequency by time block and summarizing the main food categories observed in children-directed advertisements.
3. Coding the intended target audience (coded target age group and coded target gender) to describe which groups were most frequently addressed by children-directed food advertisements.
4. Describing product characteristics relevant to cariogenicity (e.g., sugar content when available, and consistency/texture such as sticky vs non-sticky; liquid vs solid) based on information provided in advertisements and product nutrition labels when available.
5. Comparing advertising patterns with available caries indicators for each country to identify potential descriptive associations.

This thesis uses secondary data and conducts primary data collection through observation of live television advertisements.

4. RESULTS

A total of 448 advertisements were observed during the filling out of the diary. The countries recorded were Italy and Spain. The recorded timeline was from 1st December 2025 to 25th February 2026. Of these, 151 were classified as children-directed advertisements, and the rest were adult or non-kid-related advertisements, which were discarded from the analysis. Food and drink advertisements accounted for 68% of the total sample.

4.1. Description of the advertising sample

Table 1 - Ad sample description in Spain, 2025		
	n	**%**
Kids directed food ads	89	42%
Adults/non kids ads	123	58%
Total ads observed	212	100%

Table 2- Ad sample description in Italy, 2025		
	n	**%**
Kids directed food ads	62	27%
Adults/non kids ads	174	73%
Total ads observed	236	100%

A total of 212 advertisements were observed in Spain, of which 89 (42%) were directed to children. The remaining amount of 123 (58%) was classified as adults/non-kids advertisements (Table 1). In Italy, of the 236 observed advertisements, 62 (27%) were directed to children. On the other hand, 174 (73%) were directed to adults/non-kids (Table 2). Overall, the proportion of kid-directed food advertisements was higher in Spain (42%) compared to Italy (27%) in the observed sample.

4.2. Distribution of advertisements by time block

Table 3 - Ads by time block in Spain, 2025	**kids food ads**	**adult/non kid ad**
11:00-12:00	19	25
12:30-14:30	27	38
16:46-18:00	15	21
18:30-19:30	11	18
19:40-20:52	17	21

Table 4 - Ads by time block in Italy, 2025	**kids food ads**	**adult/non kid ads**

11:00-12:00	18	32
12:30-14:30	14	45
16:46-18:00	11	26
18:30-19:30	7	37
19:40-20:52	12	34

Table 3 shows the distribution of advertisements across time blocks in Spain. Kids-directed food advertising ranged from 11 ads (18:30–19:30) to 27 ads (12:30–14:30). Adult/non-kids advertisements ranged from 18 to 38 across the same blocks, with the highest adult/non-kids number also occurring at 12:30–14:30 (38 ads) (Table 3).

Table 4 shows the time-block distribution of advertisements in Italy. The time block was recorded from 11:00 until 20:52. Kids-directed food advertising ranges between 7 and 18 ads recording the highest number (18) at the time slot of 11:00-12:00. Meanwhile adults/non kids advertisements ranged from 26 until 37, recording the highest number of ads (37) between 18:30-19:30 showing additionally a big gap between kids food ads and adults/non kid ads at that time slot (Table 4).

Across the observed time blocks, kids-directed food ads represented roughly 38–45% of ads within Spain's time blocks, compared with approximately 16–36% in Italy's time blocks (Tables 3–4).

4.3. Distribution of advertisements by coded target gender and coded target age group in Spain and Italy.

Table 5 - Distribution of advertisements by coded target gender and coded target age group in Spain (2025).	**Females**	**Males**
3-6 years old	3	7
7-12 years old	8	13
13-16 years old	14	17
17-19 years old	12	15

Table 6 - Distribution of advertisements by coded target gender and coded target age group in Italy, 2025	**Females**	**Males**
3-6 years old	4	8
7-12 years old	5	7

13-16 years old	9	10
17-19 years old	8	11

Table 5 shows the distribution of advertisements by coded target gender and coded target age group in Spain. Advertisements are directed particularly at kids between 13 and 16 years old, with a primary focus on boys. It is also important to note that there was limited research on the number of ads directed to kids ages 3 to 6 (Table 5).

Table 6 shows the distribution of advertisements by coded target gender and coded target age group in Spain. Most advertisements target the 17-19 age group, especially male teenagers (Table 6).

Overall, Spain and Italy share the same idea of ads directed mostly at male children in the same age group (Tables 5-6).

4.4. Descriptive characteristics relevant to cariogenic potential (advertised foods)

Table 7 - Characteristics of food ingredients appearing in ads related to caries prevalence in Spain,2025

Product name	Fruttamax	Nesquik	Cuetara Choco flakes	Tostarica Oceanix	Dinosaurus	Colacao	Nocilla
Type	syrup	powder	cereals	biscuits	cereals	powder	cream
Additives	Citric acid	-	Glucose syrup	-	Glucose & fructose syrup	-	cocoa butter
Sugar content per 100g/ml	65g	19.9g	27g	23g	22g	9.1g	56g
Consistency	sticky (acacia gum)	Viscous	Crunchy	Crunchy	Crunchy	Viscuous	Viscuous
liquid/solid	liquid	Becomes liquid	solid	solid	solid	Becomes liquid	solid

Table 8 - Characteristics of food ingredients appearing in ads related to caries prevalence in Italy,2025

Product name	Coca cola frizzy	Bauli - girella	Mulino Bianco - pan goccioli	Mc Donald's	Kinder - Pan e Cioc	Ringo	Plasmon
Type	liquid	brioche	brioche	hamburger	brioche	biscuits	pudding
Additives	fructose syrup	-	-	fructose syrup	-	-	-
Sugar content per 100g/ml	10.7g	32g	16g	6.9g	26.7g	23.5g	7.8g
Consistency	dense	soft	soft	dense	soft	crunchy	viscuous

liquid/solid	liquid	solid	solid	solid	solid	solid	solid

Tables 7 and 8 summarize selected characteristics of advertised food products that may be related to cariogenicity, including sugar content (g/100 g or g/100 ml), consistency, liquid or solid product, and whether there is an additive that could lead to caries. In Spain, sugar content varied substantially across advertised products, ranging from 9.1 g/100 (cocoa powder product) to 65 g/100 (syrup-type product) (Table 7). Several advertised products were described as sticky/viscous or becoming liquid when prepared, while others were classified as solid and crunchy (Table 7). In Italy, sugar content also varied, for example, ranging from 6.9 g/100 (hamburger-type product) to 32 g/100 (brioche-type product) (Table 8). Across products, both liquid beverages and solid soft/crunchy foods were observed (Table 8).

5. DISCUSSION

This study examined television food advertising directed at children in Spain and Italy and revealed its potential to influence children's eating habits and oral health. There is still limited evidence in the scientific literature linking television viewing to dental caries (14).

Comparing Spain and Italy shows both similarities and important differences.

Although many non-food products were advertised, food advertisements constituted an important presence in children's advertisements (15).

A fundamental aspect is that television persuades and informs children (8,14,15). It has a fundamental influence not only on the choices of the child and their parents but also on patterns of behavior, stereotypes, preferences, and attitudes (16). Children are increasingly becoming targets of the advertising industry, not only because they consume many products designed specifically for them, but also because they influence their parents' choices (14). Most advertisements in both countries depicted slim children or adults consuming high-calorie foods, and children were persuaded to buy the advertised product because their favorite models or actors appeared in the advert (1).

The main finding of this thesis was that children-directed food advertisements constituted a substantial proportion of the observations, with a higher proportion in Spain (42%) than in Italy (27%). Similarly, León-Flandez et al. (2012) stated that approximately 61% of the food and drink advertisements identified in their study in Spain were directed at children (2582 out of 4212)

(12). In addition, Gallus et al. (2016) found that 21.4% of the advertisements recorded in Italian television programming were classified as targeting children (810 out of 3789) (13).
In Spain, channels such as Clan TVE, RTVE Play, and Disney+ were viewed. In Italy, channels such as Italia Uno, Mediaset Infinity, and Boing were viewed.

The current study was done to evaluate the influence of television food advertisements on children and their impact on caries prevalence.
Pine et al. [2007] observed that advertisements rarely featured fruits, vegetables, protein-rich foods, and dairy products. Whereas foods rich in fats and sweets appeared frequently, with candy being the most commonly advertised product (17). Among adolescents, soft drinks, chips, and snack foods are often linked with enjoyment, socializing with friends, independence, affordability, and convenience (18). The most-viewed ads among Spanish children featured low- or no-nutritional-quality food products, which does not help prevent dental caries in this population, as stated by Mireia Montaña et al. [2019] (19). Félix Alexìs Morales Rodriguez et al. [2026] stated that in Spain, a child aged 4 to 12 years watches an average of 20 unhealthy food or beverage commercials per day, totaling approximately 7,000 per year (20).
In Italy, fruits and vegetables were never advertised during children's programs, and most dietary products promoted were snacks with high levels of energy, fat, salt, and sugar, as supported by Silvano Gallus et al. [2021] (13).

Finally, food products featured in television advertisements could be associated with high sugar consumption, leading to high caries risk. Morgan et al. [2008] confirm a strong association between sugar intake and the prevalence of dental decay (8).
Some differences between the two countries emerged. In 2020, the WHO presented an oral health country profile for Spain, revealing that, in a population of 47 364, the average amount of sugar available for national consumption was 89.4 g/day per capita (21). Spain, therefore, has a relatively high sugar intake, reinforcing the statement that frequent sugar consumption is a major driver of dental caries. This is supported by the fact that, in Spain in 2020, the prevalence of caries among primary teeth was 37.4%. In the permanent dentition at age 12, caries prevalence was 30.1% (22).
In Italy, among a population of 59 501, the available sugar intake is 87.5 g/day (23). Evidence from Donato Angelino et al. [2024] indicates that food advertising on Italian television directed at children predominantly promotes low-nutrition products. Most advertised items were classified in unfavorable Nutri-Score categories, were frequently ultra-processed, and often

failed to meet WHO and PLEDGE nutritional standards. From an oral health perspective, this pattern is concerning, as exposure to marketing for sugar-rich and ultra-processed foods may reinforce eating behaviors associated with a higher risk of dental caries. This is especially important in Italy, where epidemiological studies continue to show a non-negligible burden of caries among children, with reported prevalence values of 21.6% at 4 years of age and 43.1% at 12 years of age (24). Therefore, the poor nutritional profile of foods advertised to children may not only have implications for obesity and general health but may also contribute to the persistence of childhood caries in the Italian population.

As shown in the Results section, in Spain, Fruttamax® had a sugar content of 65g/100g, exceeding the required daily sugar intake.
In Italy, the famous brand Kinder® with the specific Pan e Cioc® showed the highest sugar content, being 26.7g/100g.
Muneera Al-Muzyad et al. [2012] confirmed that having an increased sugar content can cause tooth decay due to its cariogenic effect (25).
Kelly et al. [2019] found that the more different types of unhealthy foods children are repeatedly exposed to, the more likely their unhealthy eating habits are to be reinforced and worsened (13). A concern also highlighted by the WHO (3,7).

The present findings indicate that the impact of food advertising on pediatric dental caries cannot be explained solely by the existence of regulatory frameworks, but rather by the extent to which such frameworks are effectively implemented and enforced (26). In Spain, the PAOS code was introduced to reduce obesity, overweight, and dental caries associated with irresponsible food and beverage advertising directed at minors (27); however, evidence of substantial non-compliance suggests that its protective role has been limited in practice. This is particularly relevant given reports that persuasive techniques in television food advertising aimed at children have intensified despite WHO recommendations to reduce children's exposure to the marketing of unhealthy products. As a result, children continue to be widely exposed to foods and beverages high in free sugars, a major risk factor for dental caries identified by the WHO (3,7).

The persistence of caries is therefore better understood as the result of an interaction between incomplete enforcement of advertising regulations, continued exposure to unhealthy food

marketing, and broader determinants such as sugar consumption, socioeconomic inequalities, oral hygiene practices, fluoride exposures, and access to preventive dental care (27,28).

WHO identifies free sugars as a major risk factor for dental caries, which helps explain why continued promotion of sugary foods and drinks remains relevant to oral health outcomes (3). Comparison with Italy further supports this interpretation: although the Italian IAP framework is more general in structure, it also includes provisions concerning food and beverage marketing directed at children or likely to reach them, suggesting that differences between the two countries depend not only on the rules themselves but also on how they are applied within wider public health and oral prevention systems (11). Moreover, the reviewed studies showed clear implications for both general and oral health, with excessive screen time being associated, with moderate certainty, with a more cariogenic diet (14).

Taken together, these findings underline the need for clearer independent and operational standards for food advertising directed at children, as well as stronger monitoring and enforcement mechanisms across all television channels and media platforms (18).

6. CONCLUSIONS

This study shows that exposure to food advertising is an important factor influencing the prevalence of dental caries among pediatric populations. The comparison between Spain and Italy suggests that, although the overall patterns were broadly similar, there were some relevant differences in advertising modalities and outcomes. Spanish children appeared to be exposed to more television advertisements, whereas Italian children showed a higher prevalence of dental caries at age 12.

These findings indicate that the relationship between advertising exposure and dental caries is not explained solely by the quantity of advertisements, but also by the nutritional profile of promoted products and broader factors such as regulatory effectiveness, dietary habits, and preventive oral health measures.

Therefore, despite the limited differences observed between Spain and Italy, the results support the need for stronger action in both countries to reduce children's exposure to unhealthy food advertising and to better protect pediatric oral health.

7. LIMITATIONS

Access to historical data was limited due to data-protection and privacy requirements. Older announcements were not available for review because they were restricted from some databases due to the requirement of an institutional subscription. As a result, the data obtained

allowed a limited time range, which may have reduced the study's ability to detect long-term trends. Future work could address this through secure, privacy-compliant access (e.g., data-sharing agreements), where permitted. Additionally, another limitation of this study is its exclusive focus on television advertisements, which excludes digital advertising on platforms such as YouTube, even though children are increasingly exposed to content in these online environments.

8. SUSTAINABILITY

Sustainability should be understood as a worldwide concept that includes not only environmental protection, but also health, and the responsible use of technology. With this thesis, health and technology are particularly relevant, as both strongly influence children's lifestyles and long-term development. Promoting healthy habits in childhood is essential from a public health perspective and is also closely connected to sustainability. A healthy lifestyle based on balanced nutrition and positive daily habits helps prevent future pressure on healthcare systems and improves quality of life. In this sense, children's health is not only an individual matter, but also a social and sustainability-related issue.

Technology also plays a major role in sustainability by shaping how information is communicated and understood. Television advertisements and other communication platforms can be powerful tools for being aware. When used responsibly, they can promote positive health messages and encourage more sustainable lifestyles. It is important to consider not only the presence of technology as a useful tool, but also the ethical and social impact of the messages it delivers.

Overall, sustainability in this thesis can be understood through the relationship between health and technology. Supporting healthy lifestyles in children and promoting responsible communication are both fundamental steps toward a more sustainable future.

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