

Bug and the Bacteria: Are these the Unique Mental Representation of Tooth Decay?

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Abstract

Objective: Dental caries has a multifactorial aetiology and affects a large part of children's population worldwide, sometimes configured as a chronic disease. The use of drawing as a projective technique has revealed to be of great use on accessing children's perceptions regarding health issues. The present study aimed to understand how children experience the mental representation of dental caries.

Methods: In this exploratory study, the sample consists of 812 children aged between 6 -12 years, recruited from appointments of Paediatric Dentistry at the Egas Moniz University Clinic. This study combined a qualitative methodological strategy with quantitative parameters. Participants were invited to draw a healthy tooth and an (un)healthy tooth. In the present study, only the illustrations regarding (un)healthy tooth has been analyzed through a content analysis grid, to explore the presence of dental caries on the drawing teeth. It was taken into consideration five (5) analytical categories and subcategories, from the content analysis grid designed especially for this research: i) fractures, ii) stains, iii) cavitation, iv) symbols and v) extra drawing.

Results: In the present study, Tooth Decay were mental represented by children mostly as Stains. Some participants also drew tears, representing the pain associated to the dental decay. Extra drawings such as bugs, thermometers, bandages and ice bags, were also drawn by the participants expressing the idea of a sick tooth.

Conclusions: The drawing as a projective technique of a qualitative nature is a graphical record of high empirical relevance.

Keywords: Dental Decay; Drawings; Projective Technique; Oral Health Education; Mental Representation

Introduction

Dental caries has a multifactorial aetiology and affects a large part of children's population worldwide, sometimes configured as a chronic disease [1]. The prevalence of dental caries in Portugal have been decreasing considerably in children between 6 and 12 years of age, but it continues to be considered as a public health issue [2-4].

Diet, oral hygiene habits and limited access to dental services seem to be the most relevant factors related to the onset of dental decay [4-7]. These aspects should be introduced into children's lives from an early age once they represent the starting point for good choices in adulthood [6,8,9]. According to Areias, *et al.* (2008), the child's first visit to the dentist should occur after the first tooth has erupted and before the first year of age. Dental caries, when untreated, have a significant impact on the child's quality of life [10]. Dental pain is one of the main consequences of dental decay [11] and influences oral health self-perception and fear associated with the Dentist appointment [12].

In 2016, Dias and Simões published an exploratory study named – On the mental representation of (un)healthy tooth: (Un)healthy tooth profiles among children-regarding children population that went to a dentist appointment. The results showed that the pictorial representation for a healthy tooth was one-dimensional (93%), of small size (55%) and with a rectangular shape (58%). It was a stylized tooth (82%), one that was not frequently anthropomorphized (89%). When it was anthropomorphized, the drawings showed happy faces (79%), with eyes and mouths. Most of all, it was a clean tooth, characterized by the absence of spots, holes, fractures and vermin, roots (59%) and whose surface were smooth (73%).

Dias, Santos, Naben and Ventura (2019) also investigated children's self-perception of dental decay and ended up pointing to the need for developing educational tools for Oral Health Education, to prevent caries in deciduous teeth and to foster good oral hygiene habits. Therefore, it is of the utmost importance to acknowledge children's beliefs and perspectives about health and disease, but this also represents a challenge in finding an appropriate way for children to express themselves [13,14]. However, although the pre-school caries, commonly referred to as early childhood caries (CPI), is recognized by the American Academy of Pediatric Dentistry as an impacting problem of Public Health, there continues to be a residual gap of scientific studies at national and international level on the mental representation of the concept of caries experienced by children, as well as the role played by parents and educators.

The present study is focused on the concept of child-centered research in the way that it considers children's capacity of reflecting on their own thoughts and experiences. Instead of researching on children, it is rather more productive to include them as relevant information reporters and change agents [15]. The use of drawing as a projective technique has revealed to be of great use on accessing children's perceptions and experiences regarding general health and oral health issues [16-18]. Moreover, drawings can be used with children of all ages, it is a familiar task in the child's life and is a form of non-verbal communication that does not require an immediate response, giving the child the opportunity to deliberate on it [19]. The present study aimed to understand how children experience the mental representation of dental caries, in particular, if Bug or/and Bacteria are the unique mental representation of tooth decay.

Materials and Methods

In this exploratory study, the sample consisted of 812 children aged between 6 and 12 years of both sexes, recruited from appointments at Pediatric Dentistry appointments at the Egas Moniz University Clinic (Almada, Portugal). From the 812 children of the sample that drew a pictogram of a sick tooth, 764 of them drew dental caries. This study combined a qualitative methodological strategy with quantitative parameters. Participants were invited to draw a healthy tooth and an (un)healthy tooth. In the present article, only the illustrations regarding (un)healthy tooth have been analyzed through a content analysis grid, to explore the presence of dental caries on the drawings. It was taken into consideration five (5) analytical categories and subcategories, from the content analysis grid designed especially for this research: i) fractures, ii) stains, iii) cavitation, iv) symbols and v) extra drawing.

Results and Discussion

In the present study, Tooth Decay was mentally represented by children mostly as Stains, cavitation and fractures (Figure 1 and 2). Some participants also drew tears, representing the pain associated to the dental decay. Extra drawings such as bugs, thermometers, bandages and ice bags, were also drawn by the participants, expressing the idea of a sick tooth, and it was also possible to find that 93.7% of the sample drew at least one of the categories mentioned above. With regard to the subcategory stains, there is also a majority of the design of stains in respondents having 10 years of age (23.0%), followed by 12-year-old subjects (17.6%), and of the 8- and 9-year-olds that represented 14.2% and 14.9%, respectively.

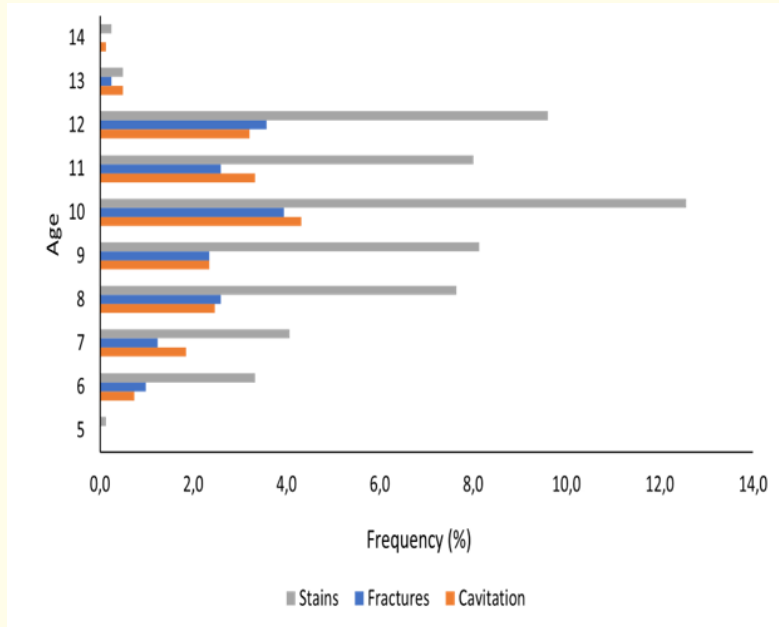


Figure 1: Tooth decay was mentally represented by children mostly as stains (54%), cavitation (18,8%), fractures (17,4%).



Figure 2: Mental representation of a sick tooth displaying stains, fractures and cavitation.

The stains were also evaluated in relation to size. Most respondents (24%) invested in the representation of “medium” sized stains, followed by 14.8% that drew “large” stains and 12.2% that drew them “small” stains.

On the other hand, the orbital subcategories that support the mental representation of the concept of caries internalized by the subjects, appear to be corroborated by the results obtained in Extra Drawings. This refers to contents associated with eating behaviour, the aetiology of the disease and the affective-emotional behaviours of perceptions conceived with anthropomorphization (e.g., tears; clinical diagnostic instruments).

Regarding the category Extra Drawings there was a greater predominance at the level of the representation of tears (3.4%), possibly due to its correlation with the pain caused by caries (Figure 3 and 4), represented mostly by the 10-year-old respondents (1.2%). The subcategory Animals and Bugs was also strongly represented in the perceptions (3.07%), eventually because they were associated with bacteria, among the subjects interviewed with 10 years of age (0.8%). The thermometer is also represented with some frequency (1.8%), possibly because this clinical instrument is often associated with disease. On the other hand, 12-year-old respondents (0.6%) more frequently drew Ice Bags, which is strongly associated with going to the Dentist, especially after tooth extraction, assuming a percentage of 1.1%, although more represented by the 12-year-old subjects (0.4%). The candy subcategory emerges intensely associated with the appearance of caries and was also notoriously designed by the subjects of 6 years (0.2%), assuming only 0.4% of the results in the respondents of 6, 9 and 10 years. Together with caries, the representation of the Odor subcategory with a percentage of 0.8% in 10-year-old respondents (0.2%).



Figure 3: Mental representation of a sick tooth displaying candies.

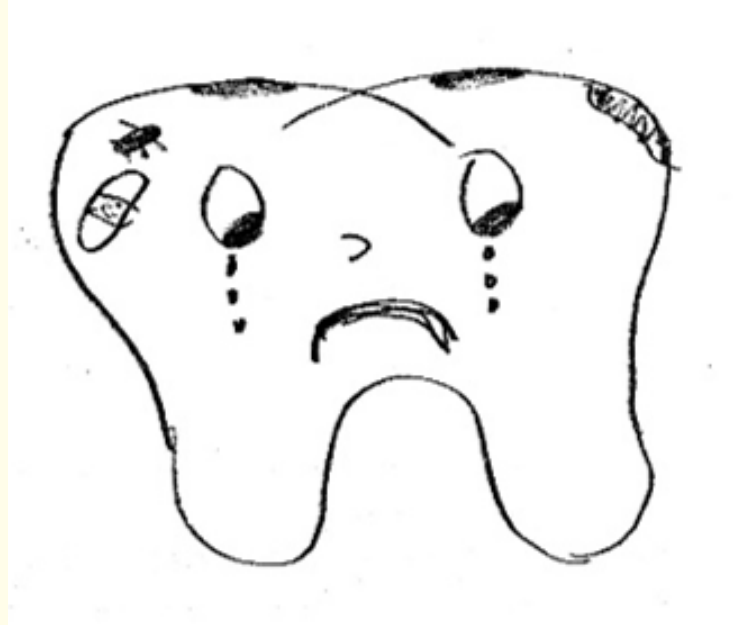


Figure 4: Mental representation of a sick tooth displaying simultaneously stains, bandages, tears and animals and bugs.

Besides, children added extra drawings (category additional drawings) such as animals and bugs (20.8%), bandages (12.5%), thermometers (4.1%), ice bags (4.1%), stink (4.1%), candies (0.4%), toothpaste (0.2%) and surgical masks (0.1%). For a better representation of the Sick Tooth, the subjects also drew tears (3.4%), which we considered a symbol representing the pain associated with tooth decay. Our findings are in accordance with a study published by Dias, *et al.* (2019), which aimed to understand how the child experiences the mental representation of dental decay and its implications on the self-perception inherent to the loss of deciduous teeth, it was observed that the subjects represent caries mostly using bugs in the subcategory animals and bugs (27.9%); in the same way, dental decay when depicted alone was rather represented with cellular contours and with the presence of flagella, which points to a mental representation (imago) associated with bacteria and microorganisms. Stains were simultaneously drawn in the presence of tears (3.1%), animals and bugs (3.3%) and bandages (2.0%). Fractures were drawn in tandem with tears (2.1%), animals and bugs (4.9%), thermometers (1.4%) and bandages (4.2%). Cavitation emerged alongside tears (2.6%), thermometers (2.6%), animals and bugs (4.9%) and bandages (4.2%). However, the subcategory stains may also be linked to dirt from the oral cavity in the imagination of children. In another study focused on the content analysis of anthropomorphized drawings of inanimate objects – The anthropomorphized emotional profile of a (Un) Healthy Tooth – namely of human teeth, in particular on what is children’s mental representation of the image of healthy tooth and of an unhealthy tooth. The mental representation of an unhealthy tooth is drawn with eyes (97.2%), a sad smile (95%), nose (8.3%), neutral smile (7.6%), eyebrows (4.2%) and tears (12.7%) [20,21].

Conclusion

Drawing as a projective technique of a qualitative nature is a graphical record of high empirical relevance because children may lack the vocabulary needed to communicate health related issues. The subcategory Stain (dark spot) was the most associated with dental caries and the predominant age of respondents in this subcategory were 10-year-olds. Extra drawings such as Thermometer, Ice bag and

Bandages seem to be drawn in association with the treatment of a Sick Tooth. Animals and Bugs, as well as Stink, were represented more frequently because they may be associated with a consequence of dental decay or as being the Caries itself. While the youngest children invested less in the drawings, perhaps due to unfamiliarity with the representation of dental decay, the older ones invested less on extra drawings, possibly because they were more focused on dental perception and on the directive that was proposed to them. There is a need of the conception of oral health programs implemented in elementary school, which evaluate children's knowledge about dental decay and the mental representation of a sick tooth concerning oral health education issues.

Conflict of Interest

No conflict of interest.

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