



## DENTAL GRILLZ - CRITICAL ANALYSIS AND PATIENT OPINIONS

Stefan Rangelov, Mariana Dimova-Gabrovska

*Department of Prosthetic Dental Medicine, Faculty of Dental Medicine, Medical University - Sofia, Bulgaria.*

### ABSTRACT:

**Purpose:** Based on a historical review of the development of “dental grills” to critically analyze and conduct a survey on patient’s view on “dental grills” about the medico-biological indicators - functional, aesthetic and preventive.

**Material/Methods:** A web search on related keywords was conducted, and the articles related to the phenomenon were analyzed. A direct survey was conducted, with a questionnaire containing 7 questions.

**Results:** We found a serious historical and cultural background of dental decorations on front teeth in the literature. For the first time in Bulgaria, a pilot survey was conducted among patients to assess the various medical and biological indicators in the application of dental decorations (grillz). The majority of patients (77.8%) that participated in the study were aware of the “grillz” phenomenon. Attitudes are rather negative towards their qualities in relation to the three medico-biological indicators - functional, preventive and aesthetic. The same applies to the social appropriation of people wearing these decorations.

**Conclusion:** Decorations on front teeth have a profound history in many cultures and also contemporary manifestations but have not been sufficiently studied. Among dental patients in Bulgaria, attitudes are rather negative towards their qualities in relation to the three medico-biological indicators - functional, aesthetic and preventive.

**Keywords:** grillz, dental grills, teeth adornment, dental decorations,

### INTRODUCTION

At the end of the XX and the beginning of XXI century in the hip-hop culture in the USA appeared the fashion of dental grills - decorations made of precious metals and gems placed on the front teeth. Although the first ones appeared in the '80s as solutions for replacing missing front teeth with minimal dental preparation or periodontal braces, the transition of many hip-hop artists in the pop culture space was marked by the imposition of tooth grills as an accessory, demonstrating empathy for contemporary hip-hop culture and high social status of the artist. It is necessary to evaluate the opinion of Bulgarian patients on dental decorations on the front teeth that gained popularity in recent years.

**The aim** of the authors is, based on a historical review of the development of “dental grills”, to critically analyze

and conduct a survey on patient’s view on “dental grills” in relation to the medico-biological indicators - functional, aesthetic and preventive.

### MATERIALS AND METHODS of research:

To achieve this goal, we conducted a step-by-step search for scientific information in electronic databases Pubmed, ScienceDirect, Scopus, as well as in the Google search engine by keywords in English (“dental grills”; “grillz”; “dental jewelry”; “tooth adornment”). With the background data collected on the topic, a short patient questionnaire was made. In the period from October 2021 to 25. 12. 2021 a direct anonymous survey was conducted among the patients of a multidisciplinary dental clinic in Sofia on the subjective assessment of the application, advantages and disadvantages of the application of “dental decorations” (grillz) among 36 (100 %) patients aged 12 to 82 years (mean age 36.22), of whom 17 self-identified male (47.2%) and 19 female (52.8%).

All surveyed patients give their assessment by answering the following questions:

1. Are you familiar with “tooth grills”?
2. Do you think that they would find an application in our country?
3. Do you think that “dental decorations” can damage teeth, gums and surrounding tissues or cause allergic reactions?
4. Do you think that speech and nutrition are impaired when wearing “dental decorations”?
5. How do “dental decorations” affect the vision of the people who wear them?
6. How does wearing “dental decorations” affect social communication?
7. How do you perceive the wearing of “dental decorations” by children and minors?

The data were subjected to statistical analysis with the program IBM SPSS Statistics version 20. The descriptive statistics used arithmetic mean, standard deviation, standard error, median and mode (for the quantitative variable - age) and absolute frequency, relative frequency - percentage and 95% Confidence Interval (CI) with lower and upper limit (for the category variables - the questions from the survey).

The Mann-Whitney and Kruskal-Wallis non-parametric methods [1] with significance level  $p < 0.05$  were used to check statistically significant dependencies between the variables of the answers.

## RESULTS AND DISCUSSION:

After excluding the repetitive articles from the found 3378 literature sources, we selected 14 articles that are the subject of analysis in the present study. The existing contrast between the number of articles (only 14) and the abundance of other and information sources on the problem is impressive. Examples include videos on video streaming platforms, commercials, documentaries, and many popular articles in dailies, online magazines, websites, etc. Despite the unproven scientific relevance of the dental decorations presented in them, the authors consider their mention in this review as necessary due to the indisputable effect on the formation of norms of beauty and aesthetics in adolescents and young people. The subjective perception of spectacular appearance and the modern phenomenon of conspicuous consumption as a way of self-expression in combination with the natural desire for the current and modern can be defined as indisputable factors in forming the concept of one's own image in young people.

### History of dental decorations

Ever since prehistoric times, people all around the globe have been mutilating their front teeth to change their appearance for different reasons. Even today, these practices are still common practice in different tribes and small communities.

The oldest gold wire splint, known as the "Giza Bridge", is dated around 2500 BC, but as it was not found in a skull, it's still controversial if it was a functional splint or an amulet of extracted teeth connected with gold wire.

The Etruscans were another civilization using gold splints to make dental "bridges". With the use of gold bands, missing teeth were replaced with artificial ones made of ivory, bone, and even gold or the extracted ones were put back in place. This is a mechanical retaining or splinting, as in our days, such restorations [2] are usually chemically pretreated [3] and fixed by adhesive connection. There is a theory that Etruscan noble women intentionally had their front incisors extracted to put the gold banded teeth as a social status symbol. The replaced incisors might have been a distinguishing message to the public that the lady is noble and she doesn't bite off her food because she has people to cook it for her. Another speculation on the findings is that these ritual extractions were a transition period mark – from a girl to a woman, from unmarried to married, from married to the widow.

Although the original artefacts were lost, there were around 20 etruscan splints found and described in today Italy, all holding extracted central incisor(s) of female individuals with golden ribbons. They are dated around 5000 BC. There are also ones holding other teeth, splinting them together. From this period are also 5 copper wire splints found in 3 burials near Durankulak, today Bulgaria, that Tomov (2017) [4] compares to the Etruscan appliances. The use of copper instead of gold and the fact that these were found on male skulls also and the lower premolar location of these splints suggests magical, prevention or healing purpose – the appliance is not on display and is made of cheaper material.

The Maya civilization in pre-Columbian Central America has been well studied with the wide variety of front

teeth alterations and decoration as gem inlays were retained in precisely drilled cavities on the front teeth – Geller (2006) [5]. The theories for their meaning are again shown social status, marriage, adulthood. The precision of the cavities made suggests that they were made by professionals. Harichane (2020) [6] makes a representation of Mayan fronts with gems embedded in them by using contemporary digital workflow – intraoral digital scan, Cone-beam Computed Tomography, Digital Smile Design, 3D printing and CAD-CAM. The results show the influential appearance of the gem decorated fronts – the author suggests Mayan "dentists" as predecessors of today's esthetic dentistry. This again brings to attention the perception of esthetics as a subjective perception formed by multiple personal, social and culturally determined factors.

### Gold standard

Gold has been preferred as a material for dentistry in crowns and filling because it is malleable, has a low temperature of melting, low corrosion rate in the moist oral cavity and wear resistance similar to enamel and dentin. When the main technology for making dental appliances was wax elimination casting, the lower casting temperature of gold alloys allowed for casting with gypsum-based investment materials. Because of their ease of manipulation, golden alloys are less labor demanding than non-precious dental alloys, so as an end price plane, golden alloy non-removable dental prostheses were cheaper than porcelain-fused metal and full-ceramic. The lower price and affordable casting technology contributed to their widespread use. Golden alloys are still considered the "gold standard" material in non-removable dental prosthetics because of their its mechanical and prevention indications. As for the esthetics – for a long period of history, golden teeth in the anterior dental arch segment were considered beautiful or at least normal looking.

Khalid and Quiñonez (2015) [7] state that the perception of straight white teeth as a social prerogative in the USA started developing in the 1950s. The "Hollywood smile" – straight bleached white teeth were projected by the media, the movie industry as part of the standard for attractiveness and health, as the authors suggest:

*"Looking at cultures across time and space, one finds that the role of teeth extends beyond that of mastication and into the social arena. Cross-culturally, modification of teeth is a social practice driven by values attached to beauty, maturity, prestige and status. In essence, teeth are linked to various forms of social distinction and identity. Furthermore, perhaps the appeal of improving dental appearance as part of physical beautification is also tied to the universal biological need for reproduction. Any characteristic that signals youth and health ultimately adds to an advantage over others in mate selection."* [7]

### Golden teeth in Hip-hop culture

In other parts of the world and among minorities in the US, golden front teeth were considered a sign of high social status and prosperity. They were cheaper than porcelain fused ceramic or full ceramic restorations and with better mechanical and prevention characteristics. Regarding aesthetics -

golden teeth as a statement of wealth and prosperity fit perfectly in the “Bling” ethics of hip-hop culture. The ‘St. James Encyclopedia of Hip-hop culture’ states:

*“The creative imagination associated with the word bling is a quintessential ethic of hip hop culture. Beyond status claiming and power yielding, bling and the long history of audacious jewelry in hip hop culture is about the ability of artists, who often come from minimal economic backgrounds, to imagine bright lives full of power, abundance, worth, and wealth — literally “living large.” [8]*

There are numerous examples of classic hip-hop artists with golden crowns and bridges in the anterior segment of the dentition - Just Ice, Flavor Flav, Buff Love, Slick Rick etc. These non-removable dental prostheses were either plain gold or with slight ornamentation but were fully functional and made by dentists. The first removable dental decorations in hip-hop were the work of Eddie Plain, a.k.a. “Famous Eddie Mouth Full Of Golds” - a NY jeweler whose “pioneering technique of combining multiple gold caps to form single sets, which could easily be removed with a slight pull, would become a cultural phenomenon.” [9] His transfer from New York to Atlanta in 1992 made grillz super popular among rappers in the South of the US – Outcast, Lil Jon, Nelly, Ludacris etc.

During the 2000’s dental grillz became a mainstream fad that’s a business for millions of dollars. The diamond covered grillz gained huge popularity in show business with the works of Johnnie Dang, a.k.a. The King Of Bling [10] – a Vietnamese-American jeweler who made custom made grillz for artists such as Paul Wall, Migos, Gucci Mane, Lil Pump, Keith Ape, Chief Keef, Jay Z, Beyoncé, Nicki Minaj, Lil Wayne, Cardi B, Rick Ross, Kanye West, Miley Cyrus, Katty Perry, Snoop Dogg etc.

The intrusion of dental decorations in popular culture became clear when during the 2012 Summer Olympics, the American swimmer Ryan Lochte showed off a specially made red, white and blue diamond-encrusted “patriotic” grill [11]. These were not his first public display of such decorations, as he had numerous pictures biting on his gold medals from world championships with his custom grillz.

It was in the 2010s when the grill fad gained its major popularity among the mainstream pop icons - Madonna, Miley Cyrus, Lady Gaga, Katie Perry, Rihanna, Justin Bieber etc. [12, 13] got their dental decorations and started showing off with them. This resulted in dental grillz becoming a trendy fashion accessory [14, 15] for the general public as well, especially among young people.

With the increase in demand, a lot of dental grillz suppliers appeared on the horizon. The quality of grillz varies, as well as their price - from factory-made plastic and metal decorations for a few dollars to individually made diamond covered full grillz for tens and hundreds of thousands. They are made by both dental technicians and jewelry designers [16], and there are hundreds of sites offering the production of individual dental decorations by sending self-printed impressions by mail and not always to certified dental technicians. This raises questions of the biocompatibility of the materials from which they are made and the potential health risks of the users in relation to plaque retention, allergies, incidental

crown chippings and fractures as these are health issues, that should be considered by a certified medical professional. Furthermore, as they can be shipped by mail, there is no way the manufacturer can check the proper fit of the appliances. These misfits can change the position of teeth in the dentition, which sometimes leads to orthodontic problems, occlusal imbalance, neurological problems [17, 18] and recession defects, requiring periodontal surgical treatment [19, 20].

### **Considerations for placing grillz in children.**

When we browse the Internet, it also shows a lot of data (photos and videos) of children wearing grillz. In this respect, child tooth restoration is a serious ethical issue that raises questions for society about the rights of children and their parents, threats to oral and mental health. Information sources present different variations: from pacifiers decorated like grillz, through grillz for temporary dentition to decorations at early school age.

Early childhood - from the moment of birth to the transition to school is a stage of human life with exceptional significance and uniqueness. It lays the foundations for the health, behavior, personal development and emotional experiences of children during this period of their lives and has a lasting impact, both on their individual well-being and on their health and long-term development. The International Convention on the Rights of the Child [21] defines as children all persons under the age of 18 and states:

#### *“Article 19*

*1. States Parties shall take all appropriate legislative, administrative, social and educational measures to protect the child from all forms of physical or mental violence, injury or abuse, neglect or negligent treatment, maltreatment or exploitation, including sexual abuse, while in the care of parent(s), legal guardian(s) or any other person who has the care of the child.*

*2. Such protective measures should, as appropriate, include effective procedures for the establishment of social programmes to provide necessary support for the child and for those who have the care of the child, as well as for other forms of prevention and for identification, reporting, referral, investigation, treatment and follow-up of instances of child maltreatment described heretofore, and, as appropriate, for judicial involvement.” [21]*

As baby pacifiers are just decorated as grillz, their use is considered more like a joke or display of a parent’s sense of humor than a health threat.

However, when giving children custom made grillz, fabricated in a jewelry store in the mall, some considerations should be taken - are the parents aware of all potential risks associated with wearing these decorations during the ongoing development period of bone and teeth, do the people making them have a license for pediatric dentistry, so they can make informed consent from the parents of their young customers/patients? Even when these “appliances” are removable, there are many potential risks for the surrounding hard and soft tissues in the oral cavity involving traumatic injuries, allergies, aspiration, interference with normal growth and

development. The acute violation of the ethical norms, as well as of the legal provisions related to the application of dental practices, leads to the termination of the activity of jewelry and other offices, in which the implementation of dental-medical activity related to impression taking from the dental arches of children and adults has been established in order to make dental decorations as described by Rosenbaum (2005) [22]

In a case report, Hollowell [23] (2007) describes the case of a 16-year old patient with rampant anterior decay after the purchase and regular use of a grill from a local jeweler store. Warnings about the side effects of wearing tooth adornments have been issued by the American Dental Association (2006) [24].

### **Consequent**

The need for medical education in the manufacture and placement of removable and non-removable dentures is regulated by law in most countries around the world. Dental decorations, even removable ones, pose health risks and are on the border between jewelry and a medical device, which raises questions about the knowledge and responsibility that their manufacturers must have.

Given the many negative effects on oral, dental and general health that grillz and dental decorations can have, important issues are on the agenda, and they are related to ethical aspects, education, the formation of the perception of beautiful-unaesthetic, normal-abnormal and others. Therefore, the psychosomatic and social effects of the use of dental jewelry need extensive interdisciplinary consideration, as do dentists, pediatricians, psychologists, anthropologists, and public relations professionals. From a dental point of view, it is also necessary, before placing such structures, to inform patients about the possible risks and accompanying effects of their use. When treating children, the dental professional needs to collect all the information available [25] before starting any treatment, even in deciduous dentition, as its health relates to the permanent one [26]. The ADA recommends that patients refrain from wearing oral jewelry [27]. Consideration should also be given to the need for regular monitoring by the dentist in order to identify possible complications in a timely manner and treat them.

### **Considerations for patients**

I. The use of dental decorations is a risk factor for the occurrence of dental defects and complications in the oral cavity.

II. The use of grillz should be applied with caution and criticality to the three biomedical indicators:

1. Aesthetics - is the product suitable for the vision of the individual and would not complicate his social relationships with others and the authorities (school, academic, public transport, media, etc.)

2. Prevention - the ornament should not help to injure the hard and soft tissues in the oral cavity, should be cleaned regularly and should not lead to plaque retention, trauma, bimetallicism, allergies, changes in the dental-maxillary relationship, abrasion, etc.

3. Function - the product should not be used when

eating, should not injure the tongue, lips and cheeks when speaking, should not interfere with salivation and respiratory activity

### **Clinical questionnaire survey**

Out of all 36 people (100%) asked Question 1, 28 (77.8%) answered in the affirmative, 8 (22.2%) had no information on the issue. With an upper limit of 95% CI of 54.8%, we can conclude that the products in question are known to more than half of the population in Bulgaria. There is a statistically significant correlation ( $p < 0.05$ ) between the age of the respondents and their answers - the youngest answered that they are familiar with and interested in hip-hop culture, the middle-aged heard about them, and the oldest said they had no information.

The majority of respondents answered Question 2, saying that dental decorations would rather not be used in our country - 27 (75%) and only 9 (25%) believe that this modern phenomenon will be used by young people in our country. This shows us that the society in Bulgaria is rather reserved for the introduction of this type of product.

To question 3, 27 (75%) respondents answered that they fear damage to oral tissues or allergic reactions. Only 3 (8.3%) of the respondents reject the possibility of dental decorations damaging the tooth and the surrounding tissues. With a 95% CI of 63.5 in the upper limit, the predominant fears of allergic reactions among the respondents are indicative.

Regarding the speech and chewing function, the answers to Question 4 show that 26 (72.2%) of the participants in the survey assume that dental decorations would disturb them. There is also a statistically significant relationship ( $p < 0.05$ ) between them and people fearing disability in their answers to Question 3.

Question 5 refers to the aesthetic indicator - and here, only 4 (11.1%) of the respondents have a positive opinion about this type of dental decoration. The majority answered that they did not find their aesthetic effect rather negative at 95% CI of 84.5.

Regarding the social appropriation indicator, 29 (80.6%) of the respondents have a rather negative attitude towards grillz - they find them unsuitable for a formal setting and cause social disapproval.

As for questions 7 - 33 (91.7%), the respondents answered that the wearing of dental decorations by children and minors should be considered critically from a psychological and moral point of view. At 95% of CIs out of 100, the negative attitude towards the use of this type of product by children and adolescents is definitely rather negative.

### **CONCLUSION**

From the results of the survey examined after statistical processing, it is clear that dental decorations are perceived by younger people, but even among them, there are dominant concerns about their safety and firm rejection of their placement in children and minors. Attitudes are rather negative towards their qualities in relation to the three medicobiological indicators - functional, aesthetic and preventive.

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*Please cite this article as:* Rangelov S, Dimova-Gabrovska M. Dental grillz - critical analysis and patient opinions. *J of IMAB*. 2022 Apr-Jun;28(2):4366-4370. DOI: <https://doi.org/10.5272/jimab.2022282.4366>

Received: 08/09/2021; Published online: 25/05/2022



### Address for correspondence:

Dr Stefan Rangelov  
Department of Prosthetic Dental Medicine, Faculty of Dental Medicine, Medical University - Sofia,  
1, St. G. Sofiiski Blvd., Sofia, Bulgaria  
E-mail: [s.rangelov@fdm.mu-sofia.bg](mailto:s.rangelov@fdm.mu-sofia.bg)