The Dental Mirror

THE YOUNGER PATIENT

Issue #9
May 2021
£FREE

Dentistry | Healthcare | Technology | Politics | Students

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Editorial

Not only is Ema my partner in putting together the Dental Mirror, but she is also my clinical partner. On the 13th of March 2020, Ema and I had our last ever paediatric clinic at the Guttman centre. Personally, this session was one of my most memorable experiences to date at Dental School. Our imagination was stretched from playing 'pee-ka-boo' with the patient behind the OPG to 'painting nails' with micro-brushes. Our love for this speciality inspired us to dedicate this issue of the Dental Mirror to this topic.

Caring for the 'younger patient' is a multifaceted job that encompasses aspects of all dental specialities which we tried to cover in this edit! With the issue of dental disease being so prominent in Paediatric Dentistry before the pandemic, I am sure you would agree it is now even more of a pressing issue that many children have been unable to see a dentist or even go to school. Having read Wafaa's article, what is even more worrying to me is the obstacles for children in refugee camps to receive any form of dental guidance or help with projects such as 'Miles for Smiles' being halted due to the circumstances.

I took joy in reading every single article and appreciate all of the hard work that has gone into these coming to life. I would like to thank all of the team for tirelessly reading and editing articles as well as the meticulous design, and the elaborate front cover of this issue!

Yours, Shiva Naser
Editor-in-Chief

The rest of the DM Team!
From left to right:

Top row: Design Editor, Artistic Editor, Artistic Editor

Middle row: Head Social Editor, Head Features Editor, Head News Editor

Bottom row: Deputy News Editor, Deputy Features Editor, SM Officer

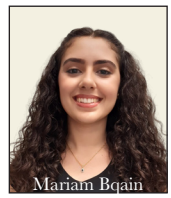
Shiva and I being fans of Paediatric Dentistry, wanted to dedicate an issue to this wonderful speciality. I'm sure many of us can agree that treating children, can often reinvigorate and make us tap into our sense of imagination, which we use to make children feel more relaxed during treatment. One of the universal fantasies many children believe in is the idea of a 'Tooth Fairy' and that's the inspiration behind our front cover design – a tribute to our imaginations and one fantasy that has been passed on through centuries.

I hope you enjoy this issue, we cover a wide range of topics related to the treatment of children from restorative and orthodontic practices, to potential benefits of sedation and current public health issues.

I want to thank our whole team once again, for spending hours; reading articles repeatedly, designing and creating the front illustration entirely with pen strokes, and formatting with finesse. It's been a pleasure working alongside Shiva as Deputy Editor-In-Chief, and we would highly welcome any feedback from staff or students on our second issue!

Yours, Ema Rutkeviciute
Deputy Editor-in-Chief


Tamam Abid


Mariam Bqain


Demi Bains


Ivie Gbinigie


Aryana Keissarian


Carrie Chew


Bella Wong


Parsa A.


Sophia Antoniou

TikTok: Does it Promote Oral Health or Dangerous Trends?

Written by **Lim Li**
Edited by **Bella Wong**

With more than 1.5 billion app downloads, TikTok's skyrocketing popularity has garnered the attention of many. As dentists, it is important to stay on top of 'trends' that may be harmful to patients and to educate them. Both harmful and useful information can be found by the public and with a wide base of users, TikTok may very well be a double-edged sword.

The #teethfilingchallenge has been the latest trend to take off in TikTok. Videos reaching tens of thousands of views are showing TikTokers attempting to straighten incisal edges and sanding them down to 'an even length' using nail files. Dr Sunny Sihra has warned users that doing so could cause permanent damage to the tooth structure as enamel cannot re-grow, so damage is irreversible. Instead, it should be done by a professional with the appropriate sterilised instruments. TikTok user, Aislinn Rendulic, 16, decided to try the viral trend and after reading comments, made further attempts to file it down. The tooth now causes her the most discomfort with cold food or drinks, an issue that only surfaced after her DIY filing.

Other viral videos include the 'veneers check' trend where users show their peg-like or 'shark' teeth, a result of teeth being shaved down to stubs for what is assumed to be preparation for veneers. However, Dr Shaadi Manouchehri has warned viewers that this could damage the nerve and patients will need a root canal treatment or even an extraction in the future. Dr Emi Mowson also points out 'stumps' are not for veneers but rather for crown preparations.

TikTok user Gypsy Lou, shared a video using InstaMorph beads as an alternative for removable partial dentures by placing the beads in boiling water, then moulding them into a tooth shape and inserting it into her mouth. Many followers thanked her and were keen to follow her instructions. Dr Vanessa Creaven states that 'dentures are designed to remain stable in the mouth while ensuring minimal gum damage'. These poorly fitting 'partial dentures' created with InstaMorph beads can lead to gum recession and possible tooth loss.

Although these videos made for shock value may attract more attention, we should also remember that many dental and medical professionals put out useful information for patients.

Dr Grant Collins, an orthodontist from Rochester, uses his fame as a TikTok influencer to educate his patients via his immensely popular page '@thebracesguy'. He has more than two million followers watching his page for dental tips and comedy, and he answers questions that viewers have regarding orthodontics. As he explains, TikTok tends to attract a younger crowd so he uses it as an educational medium while connecting with younger patients. He discusses braces-related information and debunks many myths about them. His videos also address non-clinical issues like anxiety or dread when visiting the dentist.

Dr John Yoo, a paediatrician, also uses the platform as an interesting and fun way to explain procedures to young patients and how he uses behavioural management techniques with anxious patients. He creates light-hearted videos showing him joking around with paediatric patients to distract them from their fear of the dentist.

TikTok is definitely a platform that dentists should keep an eye out for; it can be a very powerful tool for promoting oral health in a way that is fun and relatable that reaches a wide audience, but we should also be aware of the dangerous trends that can surface from it so we can educate our patients on the dangers of following such trends to prevent any further harm to them.

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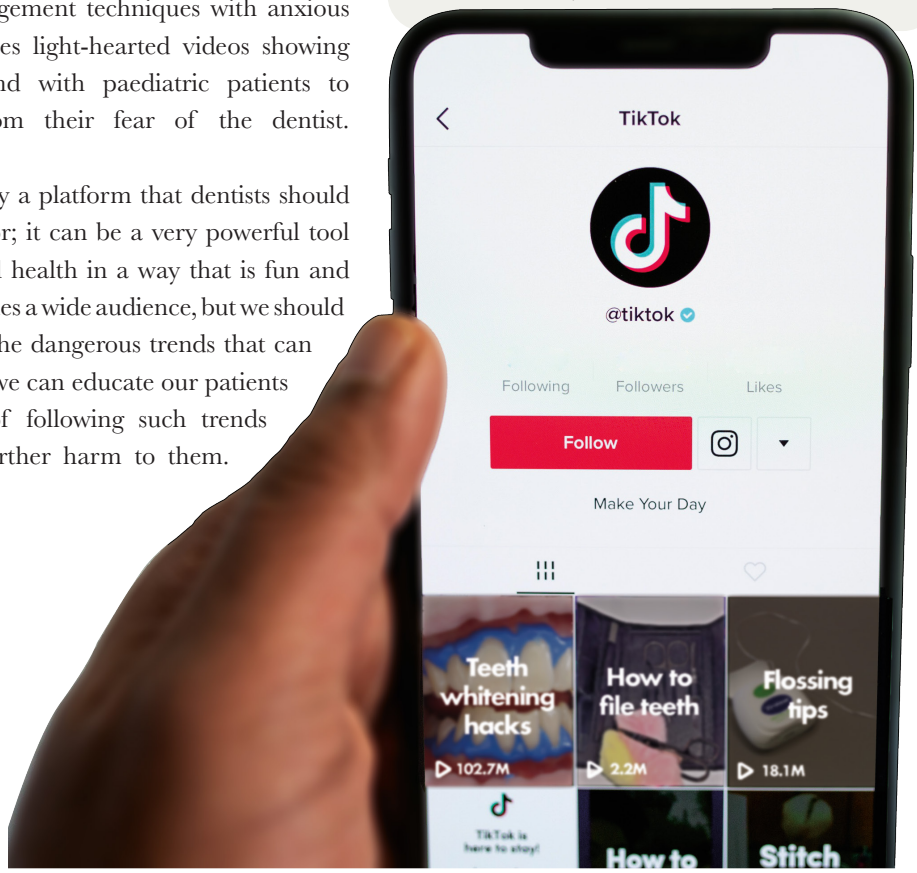

Lip Fillers & The New Law Bill affecting Under 18s

Written by **Ema Rutkeviciute**

Edited by **Carrie Chew**

Increasing societal pressure to have the 'perfect' face.
Poorly regulated industry.
Lack of a legal age limit.

Is there a demand for fillers?

An ever-increasing number of social media influencers use face-altering filters, photoshop, and even real-life cosmetic procedures to achieve sharper jaws, bigger lips and wrinkle-free features. This visage is not only limited to social media but is also becoming increasingly prominent on our TV screens, marketing advertisements, movies and magazines. As a result, there is currently a significant amount of pressure on individuals to maintain happiness within their own body image, and not compare themselves to unrealistic standards perpetuated by the media. The younger audience is particularly at risk of succumbing to these social pressures and idealising these facial features and unnatural beauty standards, whilst growing and establishing their own identity.

'...there was no legal age limit to be able to have such fillers'

Unsurprisingly as a result, in recent years the demand for non-surgical cosmetic procedures involving dermal fillers have significantly increased[1]. Dermal fillers are substances that can be injected into the face to fill lines and wrinkles, as well as add volume in areas such as the lips and cheeks. They usually last between 6 to 18 months depending on the site of injection as well as the type of filler. Many types of filler exist but the most commonly used versions in the UK contain hyaluronic acid [2].

The problems behind dermal fillers and under 18s

The problems surrounding dermal fillers are complex, but the main issue stems from the non-surgical cosmetic industry being very poorly regulated in the UK. Individuals are not legally required to have any specific qualifications or medical training to deliver these injections [1, 3]. This is alarming and raises concern as dermal fillers can cause serious complications if injected incorrectly, including; infection, lumpy textures, scarring and allergic reactions. Although rare, the most serious complications are vascular, where blockage of facial blood vessels can lead to tissue necrosis, deformity as well as blindness [2, 4].

Making matters worse, there are also shortcomings in regulating the fillers themselves, this is because dermal fillers that do not claim to be manufactured for "medical purposes" (such as those for purely aesthetic use) are exempt from being marked as "medical devices" and therefore do not need a CE (Conformité Européenne) marking. Whilst this does not automatically mean all unmarked fillers are unsafe, it does mean that recipients are reliant on manufacturers' own assessment of the safety of the product, standard of construction and materials used [4].

For those under the age of 18 in particular, Professor Mosahebi, a plastic surgeon from the British Association of Aesthetic Plastic Surgeons, explains there can be both physical and psychological risks to having these procedures. He described that "on the physical side, you haven't quite grown and matured. The facial structure is still changing and growing, and fillers might damage that growth" and "on the psychological side, it is a very vulnerable time, and they need the level of maturity of really knowing what they're doing" [3].

Before April 2021, legally in the UK "there was no statuary provisions restricting access to cosmetic filers for children and young adults". In other words, there was no legal age limit to be able to have such fillers [5, 6]. Although many professional providers do not approve of under 18s undergoing these procedures for aesthetic purposes, the majority of high street clinics with minimally trained beauticians regularly fail to ask patients for photo ID, allowing many underage consumers to easily access these risky treatments regardless [1, 3]. However, there has been change since then to address this.

Recent progression to the proposed statutory reform

The 'Botulinum Toxin and Cosmetic Fillers (Children) Bill 2019-21' was brought to the House of Commons by MP Laura Trott, as a private members' bill in February 2020. This Bill set out to make the administration of "botulinum toxin or a subcutaneous, submucous or intradermal injection of a filler for a cosmetic purpose" an offence, to persons under the age of 18 in England [5].

The Bill had its final reading in the House of Commons on March 12th 2021, progressing through to the House of Lords, with three readings having taken place by the 28th of April. A royal assent has since been made, and from the 29th of April 2021, the new legislation has been approved by Her Majesty The Queen.

It is hoped that with the approval of this Bill, children will be better safeguarded from the potential health risks of both these procedures. Where there is an assessed medical need, under 18s will still be able to have these procedures done by registered doctors, dentists, pharmacists and nurses [5]. Although this ban is now officially in place, it isn't expected to come into full force until Autumn 2021.

Further to this, there is still a lot more progress that needs to be made in regards to the regulation of these non-surgical cosmetic procedures. There would be great value in creating one central register, with regulation on the training and qualifications required to deliver these injections and restriction on which individuals can deliver them. There is also a need for more control of the fillers being accepted into the UK and CE mark restrictions. However, this Bill is still a good step in the right direction, by first aiming to protect the younger generation.

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School Closures and its Devastating Impact on Children's Mental Health

Written by **Sarah Park**
Edited by **Bella Wong**

Growing concerns are raised for children and young people as more evidence emerges on the devastating impact of school closures on their mental health, education and development.

School closures have been one of the most significant and contentious public health measures imposed during the COVID-19 pandemic.

Such closures, unprecedented in recent years, have caused an alarming increase in mental health problems amongst children and young people. Loneliness, lack of routine, loss of purpose has all had a direct impact on children's mental health and well-being.

School is often the first place that children and young people seek help for mental health problems; however, with this critical support system gone, reaching out for support can also be challenging (MHF, 2021).

The direct impacts of the lockdown and school closures on children and young people's mental health is frighteningly evident. NHS referrals for children with serious mental health problems have reached a

record high, with figures showing referrals to Child and Adolescent Mental Health Services was 4,615 per 100,000, the highest on record and a 20 per cent increase from last year. Loneliness is a key risk factor for mental health problems and a survey identified that 50% of 16-24-year-olds have experienced 'lockdown loneliness'. Peer group interaction during these developmental stages is essential for brain development, self-identity and consequently long-term mental health and well-being (MHF, 2021).

Moreover, for children and young people with pre-existing mental health needs, access to mental health support usually provided through schools has been limited. In a survey by the charity YoungMinds, which included 2111 participants, 83% said the pandemic had made their conditions worse whilst 26% said they were unable to access mental health support. Online or telephone support provided in place of face-to-face services can also be less effective for some young people. School routines are an important anchor and coping mechanisms for young people with mental health issues and such closures increases the risk of relapse (Lee, 2020).

Being "locked-in" at home with family members, many children form stronger bonds with their parents and siblings, but some may struggle, and this could lead to mental health problems. Many parents and caregivers are feeling anxious about the future, with primary concerns around financial insecurity and balancing their child's needs with work demands. Conflicts within households have negative effects on the mental health and wellbeing of young people, especially young offenders. Besides impacts on the relationship with family, school closures mean that many children lose protection from child abuse, witnessing domestic violence and substance abuse, which are likely to have exacerbated during this time of socioeconomic deprivation and parental vulnerability (Lee, 2020).

One specialist children's hospital in England reported a 1493% increase in domestic child abuse compared with the same period in the previous three years and similar surges in child abuse are being reported worldwide (Sidpra et al., 2020). Transitioning between schools has been indicated as a particular worry for primary school children, whilst academic pressures, risks of catching COVID-19 and uncertainty about the future were the main concerns for secondary school students and young adults. Regarding the prospect of returning to school, students have reported having worries about the impact of social distancing on friendships and losing the enjoyable aspects of school (MHF, 2021). Preschool children have also been forced to remain at home, and low levels of social stimulation and engagement during a child's early years are likely to have long-term developmental consequences (The Lancet, 2021).

School closures have also caused a substantial deficit in curriculum coverage. Underprepared and overwhelmed parents have been

burdened with the headache of home-schooling and reports suggest that just over 50% of parents in England are engaged with their children's home-schooling. Moreover, teachers are concerned over the lack of engagement from the most disadvantaged pupils due to lack of digital access, physical space, and other resources to support their learning and thus widening the learning gap between children from lower-income and higher-income families (Lucas et al., 2020). Upon returning to school, this disparity in curriculum coverage and widening of inequalities in learning will likely have affect an individual's learning progress and mental health (MHF, 2021).

With schools planned to re-open on the 8th of March, it is paramount that schools and guidance at the policy level provide support and reassurance to children and young people to deal with the mental health impacts of lockdown and school closures. Furthermore, to tackle the widening attainment gap, additional support will be needed for those who are vulnerable, from disadvantaged backgrounds and for whom lockdown has been particularly challenging (MHF, 2021).

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An Interview with Dr Munir Ravalia

Sedation. Hypnotherapy. And the potential link between Beekeeping and Dentistry?

Written by **Tamam Abid**
Edited by **Ema Rutkeviciute**

sedation.dentist

Barts is home to numerous gifted clinicians and having the pleasure of speaking to Dr Munir Ravalia (MR) during the A200 recruiting interviews, I thought it would be great to find out more about his line of work and share his experiences with more students in Barts. An esteemed visiting sedationist by trade and a beekeeper enthusiast by hobby, he gratefully took the time to answer some questions.

Q: So, for those who don't know you, what do you do at Barts and what do you do outside of Barts?

MR: I'm a clinical lecturer in conscious sedation and provide a peripatetic conscious sedation service for dentists in general practice. So, I take in all the equipment for the sedation service and travel around assisting dentists with their patients; some having severe anxiety and dental phobia. Others with a pronounced gag reflex and some benefit from conscious sedation due to an array of medical conditions ensure that they are safe to enter the building.

Q: What got you interested in the field of sedation?

MR: This I was always interested in 'the mind' and how acute dental anxiety is and how we as dentists get limited exposure to this. But my lecturers in sedation when I was a student really motivated me and I had a great experience at University.

Q: What are your general experiences with sedating children?

MR: I am not a paediatric dentist as per se, but I do help children with inhalation sedation and also IV for those aged 12+.

Q: So, when you have to use inhalation/IV sedation, how do you recognise and deal with nervous paediatric patients?

MR: Children are in a constant state of hypnosis i.e., they love to play games and have imagined friends etc. So, you really need to utilise this to the fullest

and enter their world by doing this you tap into their subconscious which is extremely powerful as it can allow you to achieve great dental results. Combined with e.g., inhalation sedation this hypnosedation works very well.

Q: Can hypnotherapy really work with sedation?

MR: Yes, we utilise it all the time. We are collecting more and more clinical data to see its power. Working with our new dental psychology team has been amazing as they can utilise techniques such as CBT and other modalities to also assist the cohort of patients we see in the department of sedation and special care. As I often remind colleagues that patients come to us with life not teeth.

Q: Do you think the increased PPE wear will make more children fear dentists moving forward?

MR: It all depends on how you portray it to them. As noted, if you play a game with them e.g., you can say you are also a spaceman and you need their help to enter their subconscious world, and you can use it fully to your advantage. The main issue I find with the differing masks is that it is often hard for patients both adult and children to hear what you are saying so it's worth considering other communication techniques such as writing things down so they can understand during treatment.

Q: What are the advantages of using sedation when doing treatment?

MR: Using sedative techniques can be useful for a cohort of patients that need pharmacological interventions, for example those with severe dental phobia who require acute dental care. Also, patients with learning disabilities and those not able to cooperate due to mental impairment benefit greatly for conscious sedation without which they would not be able to have their treatment.

Q: I understand you have done some research into a substance called propolis for dental applications, what is it about?

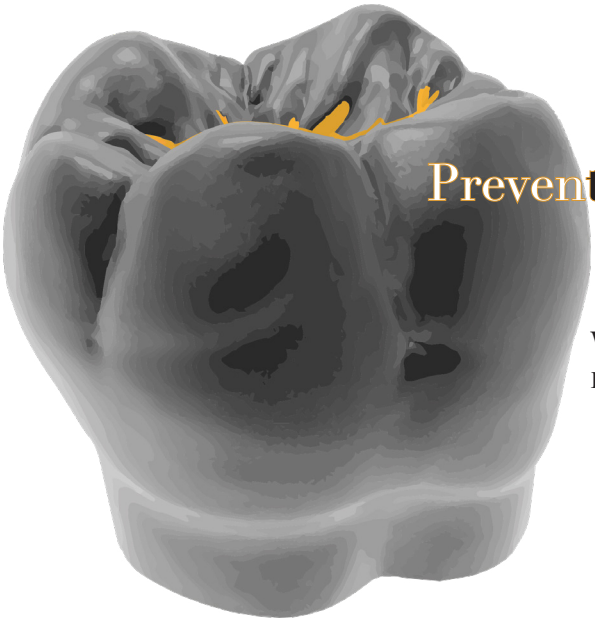
MR: Propolis is a great natural substance produced by bees as a protection for themselves and the colony. It has potent flavonoids which have been proven to really boost the immunity of humans as well. There are many excellent global studies on its use in general health but as well as in its use in the oral cavity. As it has a resinous wax-like constitution it adheres well to the soft tissues in the oral cavity and is therefore useful for example for immediate relief in oral ulceration.

Q: Is there anything else you would like to add?

MR: I am more than happy for any students from any years to come and have a chat (munir.ravalia@nhs.net) and learn more about clinical hypnotherapy in dentistry. It is a powerful technique that is slowly becoming more and more understood by the profession and has masses of global clinical evidence to show its efficacy.

Writer's reflection

It's refreshing to hear about dental topics that don't have words containing 'aesthetic', 'cosmetic', or 'going to court'. Sedation can be a powerful aid for treatments that benefit from its use, as we know the dental journey does not just involve curative treatment but encompasses the whole patient experience. Starting from how the patient feels in the chair and ending with how the patient feels leaving that same chair. Pioneering is always challenging but embracing new innovative approaches, like some Dr Ravalia has mentioned to dentistry can benefit the profession.



Preventive Resin Restorations

Are they ever really justifiable?

Written by **Shiva Naser**
Edited by **Ivie Gbinigie**

Minimally invasive dentistry is a term that is drilled into us dental students from before we even step foot into dental school. It was a key discussion point in our dental interviews and it has been ever-present in our conscience since. It has been found that 60% of all caries in children and adolescents are located in the pits and fissures of molars (Rafatjou and Nikfar, 2014). Preventive resin restoration (PRR) is a term first coined by Dr Simonsen in 1977 (Glasscoe, Aug 2000). He intended this as a method to prevent the future need for more invasive class I amalgam restorations in cases of suspected caries confined to enamel. PRR involves using the fast handpiece to cut through enamel, and then the slow to remove the infected carious tissue, resin is then used as the filling material. However, this poses the question that if we are trying to prevent the need for invasive restorations, then why is PRR considered preventative if it involves the use of a drill?

Other forms of caries preventative methods in initial non-cavitated caries include fissure sealant and fluoride varnish. Fissure sealants inhibit the progression of caries further into pits and fissures by isolating the lesion from the surface biofilm. Fluoride varnish involves applying a thin layer of 5% NaF varnish to dry fissures and pits. The fluoride enhances remineralisation of dental hard tissue without having to physically remove any dental tissue. PRR works by filling and reinforcing demineralised enamel with a low-viscosity resin. This creates a diffusion barrier inside the lesion rather than on the surface alone (Chisini, 2020).

When treating suspected caries in paediatric patients, it can be beneficial to use fissure sealants or fluoride varnish as minimal moisture control is needed and no local anaesthetic needs to be administered. This reduces the risk of inducing dental anxiety and potential future dental phobia in the young patient. However, PRRs need to be reassessed on regularly to ensure the marginal seal is intact and that the treatment has not failed. This time interval for reassessment will depend on the caries risk category of the patient. The likelihood of the patient not returning results in a greater risk of treatment failure.

BEFORE SEALANT

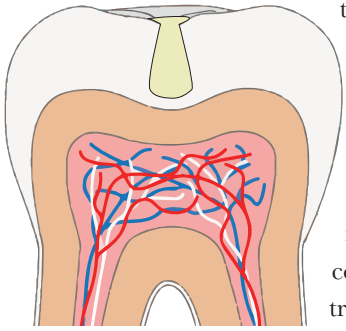
AFTER SEALANT

Caries that has not yet spread into dentine often presents as a non-cavitated white-spot lesion that will not present as visible radiolucencies on radiographs, and the patient is often asymptomatic, making it difficult to clinically diagnose. This makes it problematic to know whether caries has reached the enamel-dentine junction yet. PRR is an investigative procedure where you remove suspected carious enamel tissue.

An area of disagreement among dentists is when caries goes into dentine, and whether restorative treatment is still called PRR. If the carious lesion has progressed past the enamel-dentine junction and extended into the dentine, then this treatment will no longer be considered PRR; it is now a conventional restoration.

This is not just being pedantic for terminology's sake but rather because caries spreads more destructively in dentine which consequently leads to a widening of the cavity. Thus, more of the occlusal fissure pattern has to be taken off during caries removal, so sealing with a sealant restoration is ill-suited. Ultimately, drilling allows the clinician to better ascertain the extent of the caries. Although, this could mean healthy tooth tissue is removed in the investigatory procedure. This could prove beneficial, in comparison to fissure sealants or fluoride varnish which do not treat the disease but only halt disease progression and prevent exposure (of pits and fissures) to stimuli, in patients with a high caries risk and visit the dentist infrequently.

The likelihood of PRR failure in comparison to the fissure sealants is significantly lower and the risk of a child being unaware of a failed PRR must be taken into consideration when treatment planning.



In cases with non-cavitated carious lesions on the occlusal surfaces of both primary and permanent teeth, the American Dental Association recommend a combined approach of sealants and 5% NaF varnish (ADA, 2018). SDCEP recommends not removing any caries but rather sealing with fissure sealant in initial occlusal lesions of both primary and permanent teeth. (Scottish Dental Clinical Effectiveness Programme, 2018).

There is no recipe book for dental treatment planning. A thorough caries risk assessment is imperative and informs the clinician of the appropriate treatment options that will need to be discussed with the carer/parent and child. The different guidelines are recommendations that should be applied in adjunct to the clinician's acumen and dental experience PRR can be useful in cases where occlusal carious lesions are suspected in a high caries risk patient whose dentition you are unable to regularly monitor due to irregular dental attendance. In cases like this, PRR can be considered a preventative measure and the use of a drill can be seen as justifiable. PRR will treat caries in the earliest stage possible and requires minimal reassessment. Fluoride varnish needs to be reapplied frequently and fissure sealants are perhaps more useful in cases where periodical monitoring is possible.

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What Makes a Face Attractive: An Aetiological Perspective on Facial-Dental Development

Written by **Atena Ahmed**
Edited by **Carrie Chew**

Introduction

What makes a face attractive? Many theories have been suggested, from golden ratio proportions to facial symmetry. While some believe sociocultural influences shape our perception, others believe beauty is intrinsically discerned; infants as young as 4 months have shown a visual preference for faces that adults would deem attractive, suggesting that aesthetic values are innate in origin.

We often assume that the face we have is a result of genetics but undermine the power that our environment controls. Whilst favourable environments help to maximise genetic potential, unfavourable environments can compromise the growth of facial bones, leading to skeletal irregularities, **malocclusion** and, in essence, a less attractive face.

The origins of your face

The skull and facial bones develop via intramembranous ossification and endochondral ossification; its growth is influenced by several factors including hormones, genetics, nutrition and socioeconomic backgrounds. Facial bones follow the somatic growth pattern, where a rapid rate of growth occurs pre and postnatally, and during puberty. Contrarily, the cranial vault follows the neural growth pattern where, 60% of its adult size is reached at birth due to its initial rapid growth rate, followed by a continuous decline. The face in comparison is small with underdeveloped features and it isn't until adolescence that the facial skeleton begins to catch up in growth, with features becoming more profound. During adulthood, appositional growth and fat deposition may produce a heaviness of the features. But as old age occurs, a more shrunken and drooped appearance ensues due to a combination of bone loss, tooth loss and muscular atrophy.

Orthodontics Vs Orthotropics

Many of us have heard of or may have undergone orthodontic treatment ourselves to correct skeletal and dental irregularities. Orthotropics, on the other hand, represents a more holistic (and perhaps controversial) approach to malocclusion. The orthotropic technique bases its principles upon maxillary expansion, using removable appliances to create space rather than conventional extractions. Moreover, it avoids the need for fixed appliances and surgical intervention. It also believes that tongue position and muscle tone bear a great influence on facial posture. If the tongue sits firmly on the roof of the mouth, it forces the mouth to close, thus pushing the maxilla forward to create balance, symmetry and space for teeth. In contrast, where the mouth remains open, the maxilla narrows, and the mandible drops backwards and downwards. Consequently, it is believed that the face appears longer with a flatter profile and an undershot chin.

A case of double trouble

A study was conducted on identical twins where one twin had traditional orthodontic treatment and the other had orthotropic treatment. The orthotropic technique consisted of two phases; biobloc appliances to expand the maxilla, which resulted in prognathic growth and an increased **overjet**, followed by a correction of the overjet using biobloc postural appliances.

Figure 1 demonstrates Ben, who had orthodontic treatment and used fixed retainers to prevent relapse. Quentin on the other hand (Figure 2) was treated with orthotropics. His overjet increased from 9mm to 16mm after phase one, which was then corrected in phase two. No fixed appliances, extractions or retainers were used, and relapse did not occur. Notice how Ben has increased vertical growth and a flatter profile while Quentin has a more prognathic mandible and convex profile. The consensus is that Quentin is more attractive than his twin.

Figure 1: Traditional orthodontic treatment on Ben.
Illustrated by Heather Chen

Figure 2: Orthotropic treatment on Quentin.
Illustrated by Heather Chen

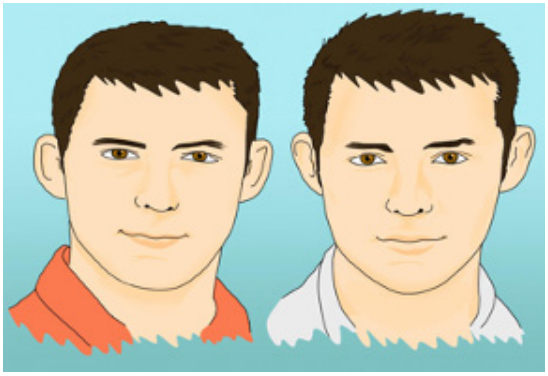

Figure 3: Ben (Left) and Quentin (Right) side by side.
Illustrated by Zariyaab Ali Butt

Worse for wear, better for bite

Orthotropics was developed in 1966 by Dr John Mew, who believed that malocclusion emerged as a dental disease of civilisation. Prehistoric skulls exhibited higher rates of wear but minimal crowding, unlike modern occlusions. This may be attributed to the Agricultural Revolution, which saw a gradual shift in mankind adopting a softer, calorie-rich diet compared to the Palaeolithic diet (wild whole grains, raw and cooked meat etc.) consumed 10,000 years ago. The human craniofacial volume has since diminished which is perhaps ascribed to reduced masticatory function, thus generating a sharp rise in malocclusion during the early/mid 18th century.

Infant Nutrition: Breast is best?

The Industrial Age saw many women give up breastfeeding, due to work opportunities, and instead began weaning at the earliest convenience. The two main oral health benefits of breastmilk are the presence of caries-inhibiting lactoferrin to protect against **ECC** and the suckling mechanism which protects against malocclusion. The pressured rise and fall of the tongue against the roof of the mouth during suckling has a widening, flattening and lengthening effect on the palatal-facial-sutural complex. Based on fossil designs, it is evident that prehistoric babies would breastfeed well into their third year, resulting in flat, broad-shaped palates as displayed in Figure 4. In contrast, narrow palatal vaults and V-shaped arches are common in today's Western-exposed children which can be related to the drop in traditional breastfeeding and increased consumption of artificial baby foods.

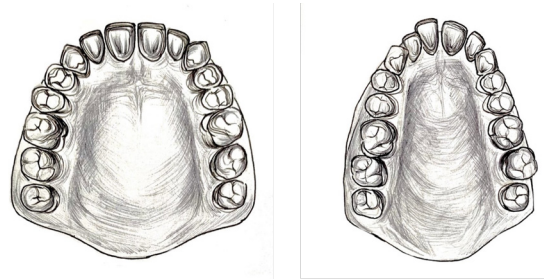

Figure 4: Prehistoric upper arch (Left) vs modern child's upper arch (Right). Illustrated by Demi Kaur Bains

Don't take inspiration from nasal inspiration

The past 1500 years has seen a rise in compact homes which has reduced the flow of natural air ventilating rooms and given rise to allergies, nasal obstructions and mouth-breathing. In 1981, an experiment was conducted on rhesus monkeys to observe the relationship between mouth-breathing and malocclusion by blocking their noses with silicone plugs. To cope with this nasal obstruction, a large proportion of the animals displayed increased tonic activity to protrude the tongue, elevate the upper lip and lower the jaw. The skeletal changes induced overtime included a downward displacement of the maxilla, increased **LAFH** due to dental extrusion, and a steeper mandibular plane. Intra-orally, **cross-bites** and **class III malocclusions** could be observed, as well as a tendency to develop a median groove in the tongue.

Similar findings can be observed in humans which suggests that mouth breathing may elicit a range of skeletal and dental irregularities. As deviant muscle recruitment is required for oral respiration, this active support decreases at night, leading to an obstructive and potentially life-threatening condition: sleep apnoea.

Complications of crooked teeth

Malocclusion being a predisposing factor for the development of chronic systemic illnesses is seldomly discussed. Obstructive sleep apnoea (OSA) is becoming increasingly prevalent in children. Paediatric OSA is often associated with early viral infections and poses life-threatening consequences. Associated risk factors for developing OSA include orally inspired air over nasal, narrow dental arches and retrognathic jaws. Furthermore, OSA has been found to have an impact on cognitive development, behaviour and quality of life. Typical findings in OSA are similarly found in children suffering from ADHD which include nasal congestion, mouth-breathing and an inability to concentrate. In 50% of children who had undergone tonsillectomy for OSA management, were also found to have their ADHD cured. This therefore highlights the importance of screening patients for OSA to prevent or manage disorders manifesting.

Baby steps

Despite efforts to draw links between aetiology, epidemiology and a cure for malocclusion, there is inadequate evidence to support the orthotropic theory. Its research has been limited and although certain clinically validating results have been displayed, it is still in its infancy stage. For the time being, it remains a philosophy, very much competing for a spot in science.

Glossary

Malocclusion:
Variation from ideal occlusion which has dental health and/or psychosocial implications for the individual

Overjet:
Distance between the upper and lower incisors in the horizontal plane. *Normal overjet is 2–4 mm*

ECC (Early Childhood Caries):
Characterised by 1+ carious, missing or filled primary teeth in ages 5 or under

LAFH (Lower Anterior Face Height):
The vertical proportion of the face ranging from base of the nose to base of the chin

Crossbite:
The buccal cusps of the lower premolars and/or molars occlude buccally to the buccal cusps of the upper premolars and/or molars

Class III Malocclusions:
Where the lower incisor edge occludes anterior to the cingulum plateau of the upper incisors

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The Smartphone Apps that want to save Paediatric Patients

Written by **Demi Bains**
Edited by **Parsa Aghamohammadi**

Technology has become a staple in modern-day living with the vast majority of children being accustomed to the use of tablets and smartphones from an increasingly young age. This phenomenon has taken hold over the last decade, with young children in urban, minority and low-income families being highly likely to have their own device by the age of four. (Kabali et al 2015) It is estimated that many children are actually introduced to devices in their first year of life, and they grow up using them for games and videos. Studies show that low socio-economic households are more likely to rely on their smartphones as their only internet source – meaning the development of specific, oral health centred smartphone applications may hold the key to reducing oral health inequalities.

Power to the patient

The internet has proven revolutionary from a medical point of view, in providing adults with a greater sense of control through the research and self-management of diseases. This is often through the use of smartphone applications – distributed through Apple's app store or Google's play store. Such applications are not aimed at a paediatric audience, but the gamification of oral hygiene practices could prove particularly appealing to children and aid in the positive reinforcement of behaviour – thus instilling the correct habits from an early age (Radesky et al 2020).

A Public health predicament

Dental caries is one of the most significant diseases to affect children worldwide, with oral health being massively important in allowing a child to thrive and grow. Tooth decay is largely preventable but consequences to children include: poor concentration in school, lack of confidence, insomnia and difficulty eating. Caries occurring before the age of 6 is known as 'early childhood caries' and is often due to inappropriate feeding habits and heavy bacterial involvement. Furthermore, the most common cause of hospital admissions in children aged 5-9 in 2012-13 was tooth decay – once allowed to progress extensively, children often face the risks posed by extractions under GA (Public Health England 2014).

The severity of this problem points towards the need for a drastic change in how we bring children into the world of oral health. In an ideal world, all children would be enthusiastic about brushing their own teeth and feel the drive to participate in their own healthy living. Unfortunately, many parents struggle to get children engaged in these behaviours and find themselves prioritising other aspects of their child's life.

'a lack of dental education in parents can translate to poorer oral hygiene habits in children'

APParently, developers might be onto something

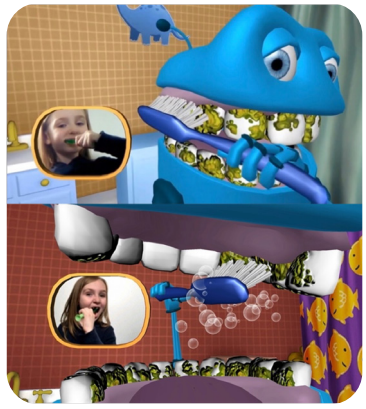
Researchers conducted a systematic search of online app stores, giving 146 oral health apps- with the majority providing brushing timers, or teaching oral hygiene techniques to its users (Nayak et al 2019). Experimental studies tested their effectiveness by developing prototype apps or testing the apps on the market already. In one study, children aged 4-7 underwent dental examinations- to include plaque indices and the detection of any carious lesions. Every child (and one parent) was given OHI chairside but those assigned to the study group also received an app as a supplementary tool for oral hygiene practice. For children over 5 years, "Time2Brush" (developer Bunner Mobile, retailer Bunner Inc © 2012 GlaxoSmithKline) was used and for under 5-year-olds, Brusheez- The Little Monsters Toothbrush Timer (developer Shondicon LLC) was used. Both apps were centred around a character that gave oral hygiene motivation for 2 minutes, with the incentive of unlocking additional features if used for a full 2 minutes. This approach proved effective, with study group children showing significant reductions in plaque accumulation, increased cooperation, and overall improved oral hygiene (Zotti et al 2019).

Another study used an app with a different approach – a gravitational sensor within manual toothbrushes was linked to a prototype app to improve manual toothbrushing. All children participating in the study were given the adapted manual toothbrush, but study group children received an app to aid in the visualisation of the mouth while brushing. Test group participants showed improved plaque indices and bleeding on probing scores at 6-12 week recall periods – compared to baseline measurements (Alkilzy et al 2019). Potentially the novelty of these apps may 'wear off' and children may lose interest, meaning any improvements may be short-lived. To avoid this, it is essential to ensure that apps continue to offer something new – such as new, unlockable features or in-game achievements to maintain interest. Unfortunately, a lack of dental education in parents

can translate to poorer oral hygiene habits in children, through a lack of understanding of the consequences to their child's health. A Saudi Arabian study set out to combat this issue with their app: "Your Child's Smile" which provided parents with essential information on their child's oral health. The level of knowledge was assessed by 2 similar questionnaires- filled by adults before and after using the app. Overall knowledge of healthy tooth development, the need for dental check-ups, and general caries preventative measures were greatly improved after app use, with parents expressing greater confidence in their questionnaire responses (favouring strongly agree/disagree options). According to the parents, 75% described it as a valuable tool in improving knowledge (Alqarni et al 2018). Educational tools such as this can be a great start to improving children's oral health but are often the least effective when used alone. Using this tool in combination with other 'hands-on' brushing apps and other preventative measures will enhance its effects.

Budd to the rescue

The free version of the Brush-Up app uses an in-game character (Budd the toothbrush tutor) who guides the child from tooth to tooth while the mirror feature allows the child to visualise themselves. The song lasts 2 minutes and the tempo aims to determine the pace of the brushstrokes. A one-off purchase can offer a full year of brushing reports or a monthly subscription can offer frequent motivational prizes. A study in Georgia, USA discovered that children aged 5-6 improved their brushing of lingual, maxillary occlusal, and posterior buccal surfaces in particular – with improved quality of brushing also. It was noted that these improvements were dependent on app usage and were not maintained one year later without using the app (Jacobson et al 2019).



Source: Screenshot from Brush Up App

It seems reasonable to conclude that smartphone apps can only bring benefits to children's oral health, through increased awareness, and motivation to participate in oral hygiene practices. To ensure the greatest possible benefit to children, these apps should be used in conjunction with other preventative measures (e.g., regular dental appointment attendance, topical fluoride application and use of fluoride-containing toothpastes).

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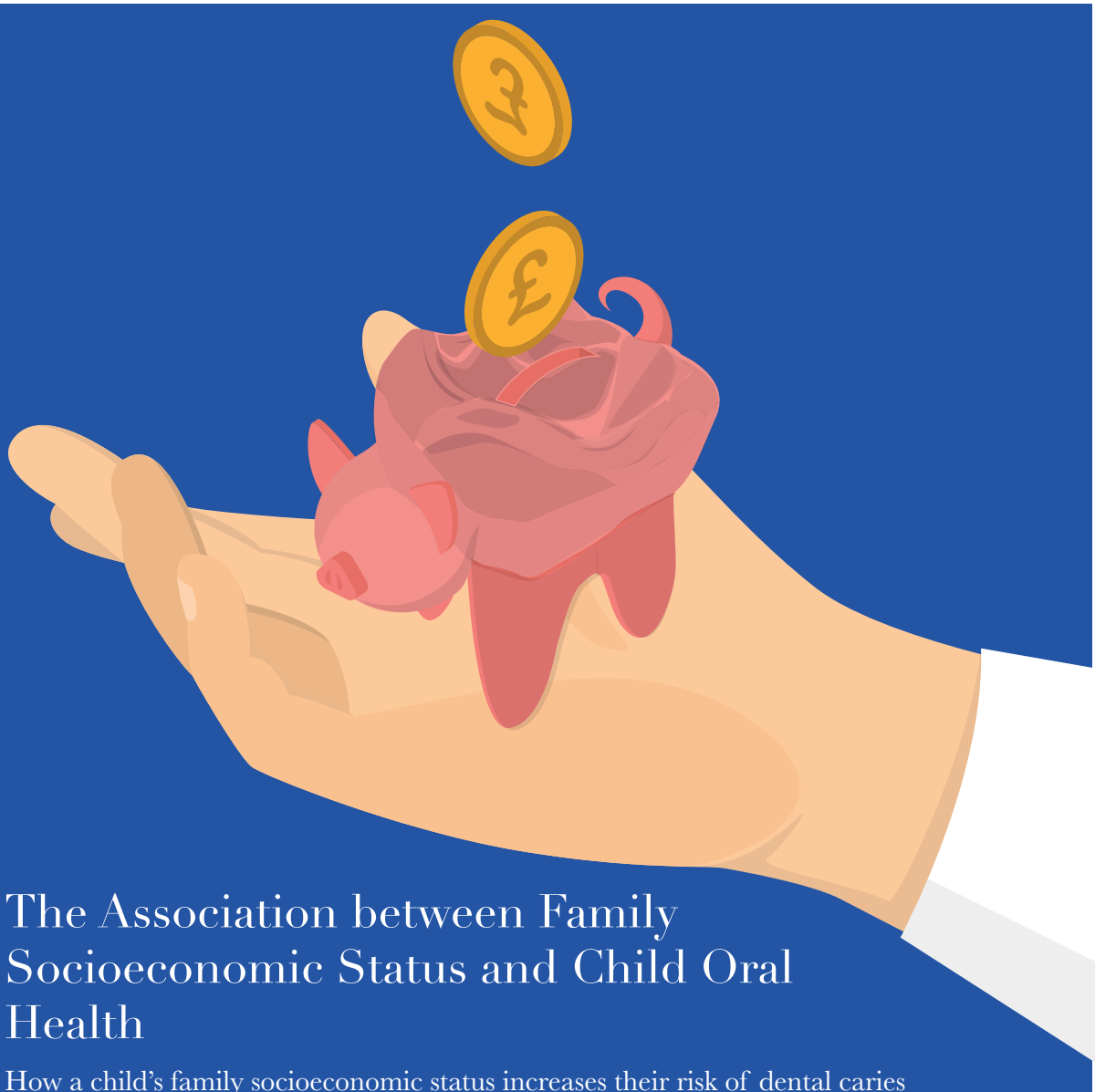

The Association between Family Socioeconomic Status and Child Oral Health

How a child's family socioeconomic status increases their risk of dental caries

Written by **Sally Techaposi**
Edited by **Aryana Keisserian**

Dental caries is largely preventable yet it remains the most common chronic disease in children in the UK. The Child Dental Health Survey revealed that nearly a third of five-year-old children and nearly half of eight-year-old children had obvious caries experience in their deciduous teeth (Health and Social Care Information Centre, 2013). Maintaining good oral hygiene is crucial to a child's quality of life, as poor oral health has a significant impact on the child's quality of life. It may lead to pain, infection, distress, difficulty with eating, speaking, socialising, sleepless nights for children and parents, and time off school and work. An average of three days of school was missed due to dental problems, and 38% of children had sleepless nights because of dental pain (Public Health England, 2020).

Socioeconomic status

Caries is a multifactorial disease. A high sugar diet and poor oral hygiene largely affect its occurrence. However, all dietary and behavioural determinants of dental caries are influenced by people's

socioeconomic status (SES). For children, their SES is based on the baseline family income and the parent's educational level (Lambert et al., 2017).

Dental caries disproportionately affects children from low-income families. These children had significantly higher decayed, missing and filled teeth (DMFT), and surfaces (DMFS) than children in higher-income families (Lambert et al., 2017). The prevalence of dental caries experience was 24% higher in five-year-old children living in the most deprived areas than those living in the least deprived areas (Public Health England, 2020). 21% of five-year-old children from low-income families had severe or extensive dental caries, compared to 11% of five year-old children from higher-income families (Rouxel and Chandola, 2018).

Oral health behaviours

Children from lower SES families were reported to have different oral health behaviours from those from higher SES families, which explains the difference in caries rate between the two groups of children. Those from lower SES backgrounds are more likely to begin brushing later in life and brush less frequently. Even though parents from both areas received the same dental health advice, parents from deprived areas were less likely to act on that advice. This may be because they are busy with other commitments such as work to earn an income to support their family, thus having less time to practise oral hygiene on their children. Consequently, these children had a higher plaque index score which means they are more likely to suffer from dental caries (Lambert et al., 2017) (Hamasha et al., 2006).

Dental attendance

Despite NHS dental care being free for children, half of the five-year-old children from deprived areas are still irregular attendees of the dentist compared to 8% of children from affluent areas. These children from disadvantaged communities only attend the dentist when they have symptoms, meaning they often see the dentist when their carious lesion is so deep, that it cannot be restored, hence resulting in extractions (Tickle et al., 1999). Moreover, children from deprived areas had lower rates of specific preventive interventions than children from affluent areas which means they get less protection from caries, resulting in a higher risk of caries (Shaban, Kassim and Sabbah, 2017).

Oral health-related hospital admissions

Dental caries is the most common reason for hospital admission for children aged five to nine years old, with over 26,000 admissions each year (Public Health England, 2017). Children from the most deprived areas were 2.6 times more likely to be admitted to hospital due to dental caries than children from the least deprived areas. As a result, many children would be missing school, resulting in the majority missing at least two school days. Not only will the missed days affect the child, but their family too. Many days off work are potentially lost as parents or carers have to take time off to take their children to the hospital, which consequently affects their income (Public Health England, 2019).

Food insecurity

Food insecurity is a social determinant of health and is defined as inadequate access to food that results in food shortages, disrupted eating patterns, and hunger. Many low-income children live in households that encounter food insecurity. Food-insecure children were three times as likely to consume fast food as food-secure children and studies suggest a relationship between fast-food consumption and dental caries in children (Chi et al., 2015).

Children from low SES families also consistently consumed significantly more sugary drinks during their first eight years of life compared to children from high SES families as such beverages are relatively inexpensive compared to milk. Moreover, over three-quarters of the children from deprived areas were reported to have a sugar-containing drink at bedtime or during the night. The differences in their dietary behaviours explain the higher rates of caries in children from low SES families (Hamasha et al., 2006).

Effect of COVID-19 pandemic on the younger patient's oral health

The COVID-19 pandemic has undoubtedly exacerbated oral health inequalities in children. Dental public health programmes have been paused since the start of the pandemic in March 2020. This has meant that children from deprived areas no longer receive fluoride varnish and supervised tooth brushing at nursery or school, whilst parents are still required to work from home, meaning they won't have time to supervise their child's tooth brushing. Additionally, routine check-ups are suspended which means a higher risk of dental caries remaining undetected, resulting in more severe caries that could lead to extraction. This also means that children don't get the benefit of receiving fissure sealant and fluoride varnish, which would otherwise help protect them from dental caries (Alderson, 2020). Dental public health programme leaders are working on a remobilisation plan to adjust to the school closure due to the COVID-19 pandemic so that children can continue to get support regarding their oral health during the lockdown. Water fluoridation is a valuable programme in preventing dental caries in the world of COVID-19 as it has a unique ability to reach all people at a minimal cost. It will be particularly useful for children that cannot receive fissure sealant and fluoride varnish due to the pandemic (Crawford, 2020).

Conclusion

Although oral health inequalities remain a huge part of our society, it is not something that we can simply acquiesce to. It is critical to target children from low SES families to minimise their risk for dental caries, to improve both their, and their family's quality of life.

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The Importance of Children's Oral Health in Refugee Camps

Written by **Wafaa Muhidin**
Edited by **Parsa Aghamohammadi**

The International refugee crisis

It is estimated that there are currently 80 million people around the world who have been forcibly displaced by violence, persecution, or natural disaster. 2.6 million of whom make it to a refugee camp. Approximately half of these individuals are under the age of 18, a quarter of which are unaccompanied by an adult (UNHCR, 2021).

As a definition, a refugee camp is a "quickly built shelter for refugees who are fleeing for their lives" (The Oxford English dictionary, 2020). Whilst a refugee camp may often serve as a temporary safe haven for desperate people, it is not surprising that in such camps, basic amenities like nutrition, water, sanitation and medical facilities are in limited supply, since the majority of refugees move to neighbouring countries who are often themselves struggling in many ways.

It is crucial to understand these population changes as refugees bring unique health and cultural experiences with them which greatly affects various aspects of their health.

Access to oral hygiene products

Where survival is in question - physical, mental and social health and wellbeing tend to be low on the priority list. I feel this is best summarised by a conversion I had with a doctor 5 years ago when I was discussing his experiences working close to a refugee camp in Kenya. He made a statement that I'll never forget: "when people have several hungry children, they are not going to spend their money on medication, let alone a bar of soap even if they desperately need it". You can imagine how far down this priority list oral hygiene products would be. It is therefore not surprising that such communities are often faced with a greater burden of oral disease.

Access to oral health services

The oral health challenges faced by children living in refugee camps are unique. Many refugee children have limited access to oral health care services. This means that key educational oral hygiene messages are absent, and in the case of torture and trauma missing and fractured teeth are common.

A child refugee living in a camp is often faced with a language barrier and limited finances. It is therefore understandable that they are more likely to face challenges when it comes to navigating the unfamiliar healthcare system of the host country (Keboa, Hiles and Macdonald, 2016).

Unique culture

The country of origin for a child refugee living in a camp is important. To understand this fully, we must engage in educating ourselves on the cultural aspects of these communities.

Each culture is unique. Some traditional diets involve a high sugar intake, and prolonged bottle feeding is common in others. Some cultures practise brushing with a branch rather than a toothbrush. All will have had varying exposures to fluoride. For many, dental caries is seen as a normal part of childhood. Some cultures may even routinely extract disease-free anterior teeth for cosmetic purposes! (Willis, Schacht and Toothaker, 2005) We must therefore seek to understand practices that influence the incidence of oral diseases amongst each refugee community.

Diet

A limited diet among those living in refugee camps greatly contributes to their associated poor oral health. We know that poor oral health has a significant effect on the quality of life. As an example, a child experiencing pain due to oral disease will have a restricted nutritional intake. This could be a major issue for one living in a refugee camp where the variety of food available is limited. Younger children and those unaccompanied by an adult are less able to communicate such pain and so there is inevitably a high rate of undiagnosed oral disease (Keboa, Hiles and Macdonald, 2016). It is therefore paramount that we focus some efforts towards reducing the burden of oral diseases amongst refugee children living in camps.

What is being done?

Oral health for refugee children living in refugee camps has been consistently noted as a concern by the World Health Organisation (WHO) (World Health Organisation, 2018). However, we currently have very limited data and literature available on this crucial matter. Various international treaties exist and obligate that essential healthcare services are available for all refugees. The degree of variance to which this moral responsibility is interpreted differs worldwide.

The FDI World Dental Federation has been working to understand the needs of this community and strategizing methods of relieving some of the known barriers and issues discussed above (FDI World Dental Federation, 2020). To widen and enable easier access to oral healthcare services for all refugees, it is vital that countries that host refugees address known barriers to curative and preventative measures of healthcare systems.

Communities that are at a greater risk of developing oral diseases, would benefit from the implementation of oral health promotion strategies (Moysés, 2012). Such strategies involve messages that must be tailored to each unique context and should include targeted culture-specific practices. Several successful dental interventions exist. An example of which is The Dental Point Project (DPP).

The DPP is active at the Moria Refugee Camp in Lesvos, Greece, and sees more than 4000 emergency patients each year (FDI World Dental Federation, 2020). Ideally, these services and messages should be delivered by members of their own community to facilitate the sustainability of the message. Focusing oral health promotion on educating children and their carers on the importance of preventing and treating oral health disease will equip such a community with good future habits.

Extra note

It is easy to want to detach from the atrocities and horrors occurring around the world in an attempt to maintain one's sanity. However, the refugee crisis is real, and it is particularly close to my heart. My own family fled the war in the 90s and became refugees in the UK. I was once technically a refugee - although I have no recollection of this. We were fortunate to have never lived in a refugee camp nor to have had to brave the cold, dark ocean in a desperate attempt for safety. We need to remember that refugees are not just statistics. Rather they are ordinary people like you and me, who have left everything behind often with no possession but the clothes on their backs. Just like you and I, refugees seek a secure and dignified life for themselves and their children.

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Preventing Disastrous Decay in Children

Written by **Duniya Majumder**
Edited by **Aryana Keissarian**

Tooth decay is reaping money and gnawing away at young people. Prevention is our solution.

Waves of excruciating and throbbing pain caused by severe tooth decay can turn a child's carefree world into a pain-filled nightmare: biting into an apple at break-time is like crunching down on a shard of glass, a game of Chinese whispers is overshadowed by the consciousness of foul breath and a good night's sleep is replaced by a restless, torturous night. Such a scenario is not uncommon; in England over 43,000 children are admitted to hospital to have teeth extracted under general anaesthetic costing the NHS £36 million annually (RCS England, 2019). This agony and large expenditure are completely unnecessary and entirely preventable. With regular visits to the dentist, a healthy diet and maintenance of good oral hygiene, children can eat, sleep, play and yell at ease.

Causes of dental decay

There is no magic toothpaste to disappear dental decay. Decay is a multifactorial disease and everyone with teeth is at risk of getting it. There is a wide range of factors that affect the risk of cavities: tooth morphology and location, diet, age, salivary flow etc. Sugary drinks are one of the most common causes of decay in young people (Mathur et al, 2017). In babies, this is most pertinent when bedtime bottles are filled with sugar-containing liquids such as milk, formula, or juice as this sits on their teeth all night, feeding bacteria that cause cavities (Dykes et al, 2002). During work experience, I encountered a young patient who was shocked when they found they had many cavities and would need multiple fillings.

The patient insisted they had a very balanced and healthy diet as they were working toward an athletic career, but it was found that seemingly healthy juices and trendy fruit-packed smoothies, which the patient consumed daily, were the culprit. This comes to show that even the healthiest young people can be affected by decay as sugary drinks come in many different forms.

Main methods of prevention

Due to the many factors and risks involved in the development of decay, every child is at risk of caries. Thus, preventive interventions are required for all children (Zipporah et al, 2015). To combat poor oral hygiene in young patients, dentists advise that children aged six and under should have supervised toothbrushing until they can brush their teeth effectively (NHS, 2017). Lack of fluoride is also a major cause of caries, as fluoride helps prevent cavities and can even reverse the initial stages of tooth damage. Thus, a fluoridated toothpaste containing at least 1000ppm of fluoride should be used (Munday et Polly, 2008). Professional intervention involving the biannual application of fluoride varnishes and placement of fissure sealants are standard practices used in children for the prevention of caries. There is a 'substantial caries-inhibiting effect of fluoride varnish' (Marinho et al, 2013) in children and resin-based sealants 'are effective for preventing caries in children' (Ahovuo-Saloranta et al, 2017).

On a broader scale, prevention is promoted through education – e.g., talks in schools – and a wider availability of fluoride and oral care products. The Childsmile initiative in Scotland ensures free daily supervised toothbrushing in nurseries and primary schools, free dental packs to support toothbrushing at home and twice-yearly fluoride varnish applications. This programme has been hugely effective, with lower levels of caries seen in children (NHS, 2019) and similar initiatives are the key to eradicating the occurrence of decay in children.

A Dentist's experience of decay in young patients

Based in Glasgow at his practice 'Ciao Paolo', Dr Paul Trevisan shares his experience of dental decay in children.

Q: Clinically, what have you found to be the most common reason for caries in children and teenagers?

'Decay is a multifactorial disease and everyone with teeth is at risk of getting it'

A: Caries is multifactorial so there are multiple factors at play. Caries used to be far more prevalent but now it's said that 90% of the caries is in 10% of the population. This is, not surprisingly, linked to socioeconomic deprivation. Specifically, due to frequent sugary intake, poor oral hygiene, lack of fluoride and poor nutrition. Also causing additional damage in teenagers is erosive tooth wear from fizzy drinks, fruit juices and sports or energy drinks.

Q: What have you found in practice to be the most effective method for the prevention of decay in young people?

A: Simple advice – if the family can be engaged – diet change and twice daily effective plaque removal with fluoride toothpaste or a higher fluoride toothpaste can be prescribed if required.

Q: What are the main impacts of dental decay that you see in young patients?

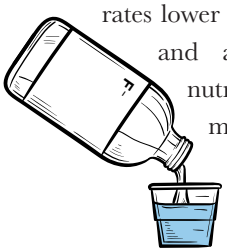
A: Suffering and trauma of dental care which may include sedation or anaesthetic. The development of phobia and avoidance of care, being unsuitable for necessary orthodontic care, resulting in hospital resources being stretched for general anaesthetic tooth removal.

Q: How do you think COVID-19 is affecting the occurrence of decay in children?

A: Much decay is going untreated resulting in the worsening of oral health. Diet during lockdown is likely to be more comfort-oriented, presumably more frequent sugary snacks and there may be possible difficulty in accessing care and delay in treating pain.

Q: Finally, do you have any other thoughts on the prevention of decay in young people?

A: Adjusting fluoride in water supplies nationwide to 1ppm can reduce smooth surface caries by 30% and is a very low-cost beneficial public health measure. Whilst this is adding fluoride in most areas, in others, it is reducing the concentration. I think bringing people out of poverty will see decay rates lower in children along with education and a proper attitude to healthy nutritious food more generally. It may be more difficult to change the prevalence of caries in areas or pockets of the population where deprivation is endemic.



Conclusion

Decay is still the leading oral disease in the UK and can have detrimental impacts on the overall well-being of a child. Prevention is the key tool in fighting the occurrence of decay, with simple lifestyle and diet swaps and minimally invasive precautionary treatments, all children can be caries-free.

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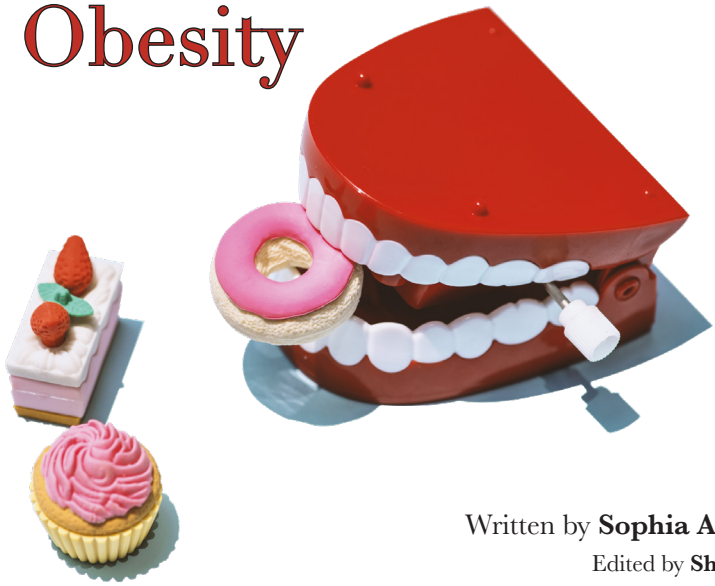
Caries & Obesity

An inextricable link?



Written by **Sophia Antoniou**
Edited by **Shiva Naser**

In 2015-16, dental extractions performed on paediatric patients cost the NHS £50 million pounds[1]. Data from Public Health England indicates that the majority of these extractions were on carious teeth. Tooth decay was the number one cause for hospital admission for children aged 5 to 9 years-old and the sixth most common procedure in hospital for children aged 4 years and under [2]. The statistics are abysmal. It is no surprise that children every day are opting to eat sugar-filled, processed snacks as a result of the unhealthy food culture we are surrounded by in the UK. The vibrant, seductive packaging of chocolate bars lands just at the eye-level of children going shopping with their parents. The local shops offer incessant deals on doughnuts. The kebab shop right next to their school is releasing greasy aromas right at the peak of their after-school hunger pangs, enticing them in. The radio and television advertisements are saturated with tantalising descriptions of ninety-nine pence burgers from inflated fast-food chains.

Synergistically, the UK has one of the highest rates of childhood obesity in Europe. Obesity is defined as having a body mass index of 30-39.9 and above if severely obese. 10% of children aged 4-5 years old were classified as obese in 2018, whilst 20% of children ages 10-11 years-old were classified as obese [3]. Children are highly influenced by their environment and upbringing. The duty falls on their parents and caregivers to set a stellar example in an attempt to fight the poisonous anti-health efforts of current society. It is no doubt easier for adults to buy the cheaper, colourful yet unhealthy snack; rather than spend more on a small punnet of berries to appease their unruly children.

Similarly, older children with raging hormones, are far more likely to choose the neon yellow bottle of Mountain Dew, than the mundane bottle of water on the shelf above it. The affordability of the Eatwell guide has been questioned, thus, there is yet a lot of work to do, to make healthier choices the easiest ones.

Though obesity is weighing heavily on the NHS, healthcare professionals must also observe the other end of the scale. A member of BSPD noted that the single unifying factor between dental health and a child's weight is poor diet [4]. The members that attend the clinic are either underweight or obese, healthy weight children are not seen as often in hospital clinics for multiple extractions. The tooth decay and resultant infection is a result of poor dietary choices, likely in combination with insufficient dental education and rotten oral hygiene practice.

The good news is, that both caries and obesity have several shared risk factors. By reducing the risk of one of the diseases, we can simultaneously tackle both using the common risk factor approach. The next few paragraphs will outline which risk factors we can target to reduce the risk of both caries and obesity.

Diet plays a role in the pathogenesis of both caries and obesity. Habits such as snacking, high frequency of sugar attacks, meal choices, consumption of fermentable simple carbohydrates, sweetened foods, all surmount to a highly cariogenic and high energy diet. The frequency and amount of simple sugars are both responsible for increasing the risk of developing these preventable yet chronic conditions. Reducing the frequency and amount of sugar consumed is critical to prevent health degradation in children. This is no easy feat as the dopamine released as part of the reward circuit for the consumption of sugary foods and drinks leads to addictive behavioural habits. As the poor dietary habits continue, the brain adjusts to release less dopamine, hence, the behaviour is repeated in increasing volumes and higher frequency to achieve the same reward 'high'[5]. By activating the opiate receptors, the compulsive habits are continued despite the detrimental effects; toothaches, headaches, hormonal imbalances, weight gain and many more.

Lifestyle characteristics have changed for many of us since the beginning of the first COVID-19 lockdown. The increased amount of time spent at home for children will likely have involved their physical activity rates decreasing, perhaps higher consumption of snacks, potentially more time listening to the television and radio all of which are likely to have negatively impacted their physical and mental health.

Unfortunately, once the disease has become established. A downward spiral may be initiated; mastication is affected by dental caries which may serve as a deterrent to crunchy, hard nutritious foods such as raw vegetables and fruit, which are harder to chew and may get stuck in the cavities. Children may instead opt for softer, processed choices which may exacerbate their dental decay and obesity status. Restricted diets will expose children to nutritional deficiencies, this concern is pronounced at such a critical stage of development. Vitamins A, D and minerals such as calcium and phosphate play an important role in tooth composition and eruption patterns. Reduced prevalence of these micronutrients in the diet of small children may predispose them further to dental caries [6].

Many other factors are involved such as socioeconomic status. It is stated that being both underweight, overweight and the presence of caries could be due to poverty and low socioeconomic status [7].

As budding dentists, we should be aware of the responsibility that lies on our shoulder to impart knowledge to those who are willing to listen and fight for changes to be made to transform our current dietary habits within the UK. Children are pivotal in enforcing a change in future generations; thus their knowledge of nutrition must be emphasised, even as they progress into adulthood.

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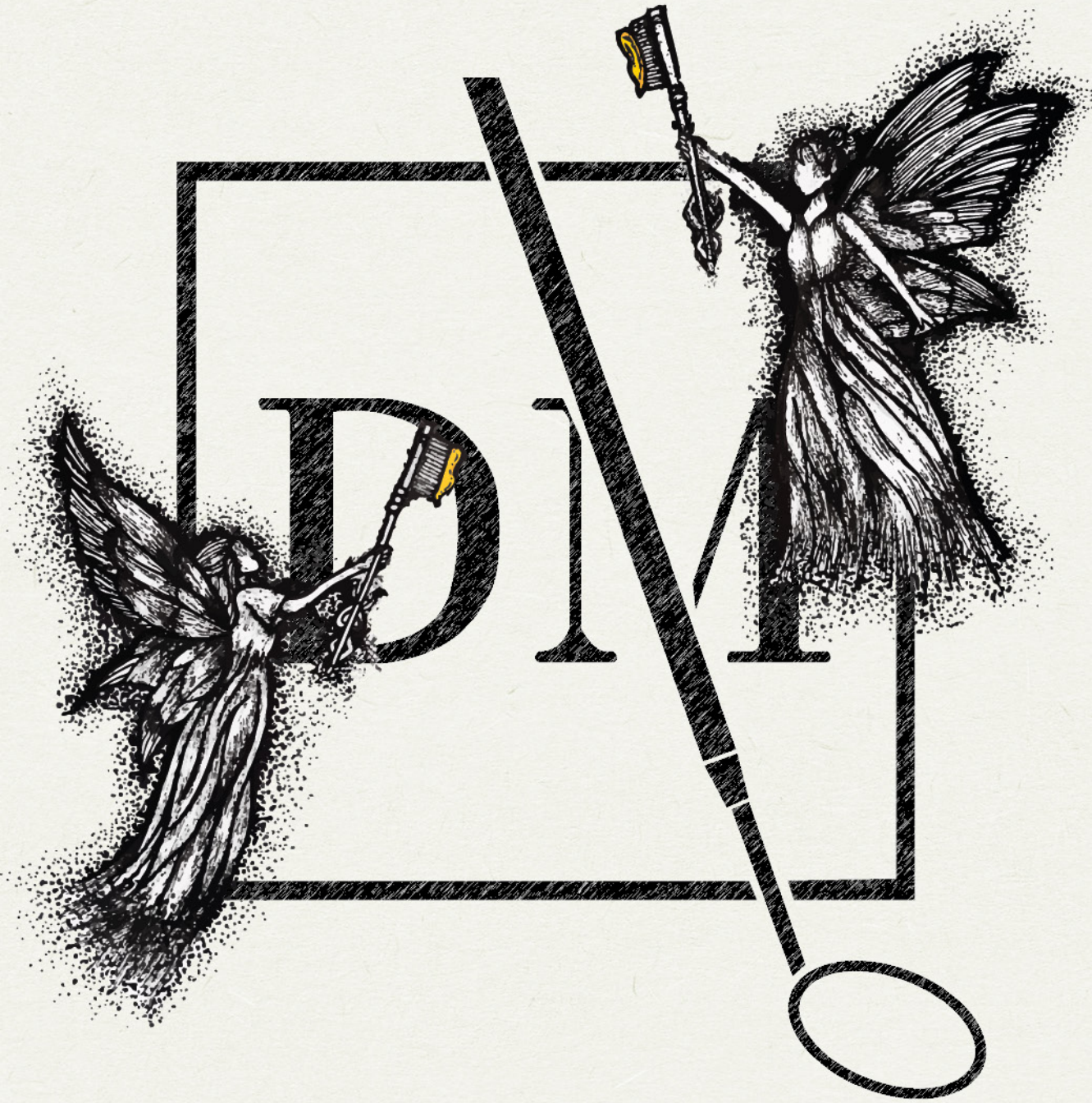

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