

Experiences of oral health: before, during and after becoming a regular user of GC Tooth Mousse Plus[®]

Alexandra Sbaraini (✉ a.sbaraini@unimelb.edu.au)

University of Melbourne <https://orcid.org/0000-0002-9682-5028>

Geoffrey G Adams

University of Melbourne

Eric C Reynolds

University of Melbourne

Research article

Keywords: Tooth Mousse Plus, qualitative research, grounded theory, compliance, adherence, oral hygiene

Posted Date: June 3rd, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-28096/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published on January 7th, 2021. See the published version at <https://doi.org/10.1186/s12903-020-01360-8>.

Abstract

Background

Clinical trials and laboratory studies from around the world have shown that GC Tooth Mousse Plus® (TMP) is effective in protecting teeth from tooth decay and erosion, buffering dental plaque pH, remineralising white spot lesions and reducing dentine hypersensitivity. However, no other study has assessed the experiences of oral health, before, during and after individuals became regular users of TMP.

Aim

To identify how participants' oral health status changed after introducing TMP into their oral hygiene routine.

Methods

A qualitative study using Charmaz's grounded theory methodology was conducted. Fifteen purposively sampled regular users of TMP were interviewed. Transcripts were analysed after each interview. Data analysis consisted of transcript coding, detailed memo writing, and data interpretation.

Results

Participants described their experiences of oral health and disease, before, during and after introducing TMP into their daily oral hygiene routine, together with the historical, biological, financial, psychosocial and habitual dimensions of their experiences. Before becoming a regular user of TMP, participants described themselves as having a "damaged mouth" with "vulnerable teeth, dry mouth and sensitivity". Various aspects of participants' histories were relevant, such as, family history and history of oral disease. Having a "damaged mouth" with "vulnerable teeth, dry mouth and sensitivity" was explained by these historical elements. Despite some initial barriers, once being prescribed TMP by a dental professional, a three-fold process of change was initiated: starting a new oral hygiene routine, persevering daily and experiencing reinforcing outcomes. This process led to a fundamental lifestyle change. Participants transitioned from having a "damaged mouth with vulnerable teeth" to having "a comfortable mouth with strong teeth"; at the same time participants felt empowered by this newly found status of being able to "keep their teeth for life". Barriers and facilitators for incorporating TMP on daily oral hygiene routine were also identified.

Conclusions

Participants valued having “a comfortable mouth” and being able to “keep their teeth for life”. Seeing concrete results in their mouths and experiencing a more “comfortable mouth” boosted adherence to daily applications of TMP, which was maintained overtime.

Background

The context of this study: adult Australians who were prescribed GC Tooth Mousse Plus® by a dental professional

This study was designed to understand how everyday adult Australians became regular users of GC Tooth Mousse Plus® (TMP). To the best of our knowledge, there is no detailed data on the characteristics of regular users of TMP; hence the context of this study is based on data from oral health population surveys, as described below.

In Australia, around 51% of adults brush their teeth twice a day, with brushing habits declining as people age (1). Most people pay for their own dental treatments (including home care recommended products) or pay for the private health insurance that partly covers the cost of dental care (2). Most adults visit a private general dental practice for a check-up at least once a year on average; residents outside capital cities visit less frequently (2–4). Most individuals visit the same private dental practitioner on a long-term basis (3, 4). Financial burden is often cited as a reason why people do not visit a dental practice regularly or comply with proposed treatments (4). Hence, this study focused on adult Australians who were prescribed TMP by a dental professional (e.g. a dental professional being a dentist, a dental hygienist, a dental therapist or an oral health therapist) when visiting a private dental practice – that is, this study focused on consumers functioning in a typical Australian social context.

What do we know about oral health care compliance and how does it relate to this study?

The term “compliance” is commonly used in dentistry to describe a patient’s readiness and commitment to follow recommendations and instructions (5, 6). Compliance can be expected in relation to treatment provided in the dental practice or to oral health care instructions to be ensued at home. Wilson described compliance as “the extent to which a person’s behaviour coincides with medical or health advice”(7). However, it is well known from the dental literature that people frequently “perceive oral health care instructions as difficult to follow and time-consuming”(8). Therefore, at the beginning of this study we assumed that individuals’ compliance would be key to reach the desired outcome of incorporating TMP into their daily oral hygiene routines. We also assumed that we could identify reasons for non-compliance, such as socio-economic factors, uncertainty about the product, competing priorities and existing habits as previously mentioned in a study looking at compliance to preventive protocols (9).

What do we know about the product?

TMP has been available in the Australian market since 2006. TMP is distributed globally by GC Corporation and GC America. In Japan, Europe, the United States of America and South America, TMP is

known as MI Paste Plus. TMP is available in strawberry, vanilla and mint flavours (Fig. 1). TMP can be easily applied after toothbrushing. TMP contains a milk-derived protein called RECALDENT™ with incorporated fluoride (CPP-ACPF: casein phosphopeptide-amorphous calcium phosphate fluoride). The level of fluoride in TMP is 900 ppm. In brief, calcium, phosphate and fluoride within TMP are available in a soluble form - this means the product provides extra protection for teeth, buffers dental plaque acid from bacteria in the mouth and protects teeth from acidic foods and drinks.

RECALDENT™ (CPP-ACP) is the result of many years of research by the University of Melbourne into the anticariogenic properties of milk. There is a high-level of evidence supporting the remineralization potential of CPP-ACP, that is, prevention and reversal of early caries lesions (10–14). In fact, there are now twelve published systematic meta analyses of the clinical studies to support the use of CPP-ACP (11–22). In addition, CPP-ACP effectiveness has also been demonstrated in relation to the reduction of cariogenic bacteria and increased colonization of commensal microorganisms, and the reduction of dentine hypersensitivity (23–26).

What do we know about consumers' expectations when applying GC Tooth Mousse Plus®?

While the effectiveness of RECALDENT™ (CPP-ACP) is well-established in the dental literature, it is not understood how regular users experience incorporating TMP into daily oral hygiene routines, what hurdles they might encounter when asked to change their routines and what is important and valued by them during such process.

In this paper, we report on findings from a qualitative study of TMP regular users' experiences while adding the product into daily oral hygiene routines, guided by the below research questions:

1. What was participants' experience of oral health before starting to apply TMP?
2. What was participants' experience of oral health after starting to apply TMP?

How has participants' oral status changed?

How do participants feel about this change?

3. What did participants value in their oral status after starting to apply TMP?

Methods

Study design

The design of this study was based on an established systematic methodology: grounded theory procedures (27). Grounded theory uses a methodically applied set of processes to generate rather than test theory (28). According to grounded theory procedures, questions are asked in an 'open' way: participants' points of view are sought at commencement rather than questions being asked to examine

pre-existing hypothesis or theories (27, 28). Accordingly, we sought to learn from participants how the process of becoming a regular user of TMP happened and how they made sense of it.

Sampling Strategy

Qualitative studies such as this one typically collect large amounts of data from a small number of participants: there is a trade-off between the number of informants and a wealth of detailed communications with each participant (28). This study was not designed to estimate proportions in a wider population, quantify relationships between pre-determined variables, or provide a single representative or average view or opinion (28). Instead, we sought to learn from participants how they experienced the introduction of TMP into daily oral hygiene routines, how they embraced or not this product, and how they interpreted this experience as explained through their views, needs, values and beliefs.

The target population for this study was consumers who had been regular users of TMP for at least 6 months prior to recruitment. Being a regular user of TMP meant applying the product daily, at least once a day. An important strength of this study is that we had an agreement with an Australian online supplier of TMP, the BreezeCare Oral Health Company. The BreezeCare Oral Health Company worked in partnership with the research team, so that consumers who bought TMP regularly could be invited to participate in this study. Breezecare's customers, who agreed to participate in the study, had different reasons for using TMP and the number of years they have been using the product also varied (Table 1). This purposive sampling allowed comparisons to be made between participants' experiences while introducing TMP into daily routines, as described during interviews.

Sample Recruitment

Breezecare's customers were invited to participate via an email invitation. This was done in partnership with BreezeCare Oral Health Company. BreezeCare Oral Health Company has a loyal base of customers, who purchase TMP regularly. Table 2 shows text used in the email blast communication sent to Breezecare's customers. We received 35 replies from customers of BreezeCare Oral Health Company. Out of those, 19 participants agreed to participate, but four dropped out: three participants dropped out because they did not have time availability for an interview and one because her child was the user of TMP instead of her.

Sample Size And Saturation

Sample size in qualitative studies is determined by reaching a complete understanding of the problem being studied – referred to as saturation (27–29). Saturation is determined by the data analyst. When new interviews became repetitive with prior interviews and central concepts were fully understood, the

analyst determined that saturation was reached (29). In this study, data collection ceased when all the important concepts arising from the analysis were fully understood. Data from the last three interviewees confirmed our findings rather than added new concepts. A total of 15 participants, ranging in age from 25 to 65 years or older, participated in the interview process (Table 1).

Interviews

In-depth interviews were conducted over the phone. Telephone interviews are of comparable length, content and quality to face to face interviews, as reported elsewhere in the literature (30). Approximately two to three one-hour interviews were conducted every month over 6 months with concurrent data analysis. The semi-structured interviews were digitally recorded, professionally transcribed in detail, and the transcripts were checked against the recordings. Table 3 lists questions that guided interviews. The main researcher/interviewer (AS) explored how participants introduced TMP into daily routines, what were their experiences of oral health before, during and after using TMP, and how this process was influenced by their social context. Interviews were conducted between August 2017 and January 2018.

Ethics Approval And Consent

Ethics approval was obtained from the Human Research Ethics Committee at the University of Melbourne (HREC ID: 1748963). As in any ethical study, we ensured that participation was voluntary, that the participants could withdraw at any time, and that confidentiality was protected. All responses were anonymised before analysis, and we took particular care not to reveal potentially identifying details of locations, dental practices participants visited or clinicians who prescribed TMP to them. Prior to being interviewed, all participants had the study explained to them and signed a consent form. After the interview, participants received a tube of TMP as a thank you for their participation.

Data analysis

Coding and the constant comparative method

Charmaz's iteration of the constant comparative method was used during data analysis (27). This involved coding of interview transcripts, detailed memo writing and drawing diagrams. The transcripts were analysed as soon as possible after each interview. Coding was conducted primarily by AS, a trained researcher with PhD and experience of qualitative research. Data analysis was supported by team meetings and discussions when researchers compared their interpretations.

Coding occurred in stages (Table 4). During initial coding, as many ideas as possible were inductively generated from early data. In Charmaz's form of grounded theory, codes take the form of gerunds (verbs ending in 'ing') which emphasises actions and processes (27). During focused coding, a selected set of central codes was pursued throughout the entire dataset and the study - this process required decisions

about which initial codes were most prevalent or important, and which contributed most to the analysis (Fig. 2). During theoretical coding, the final categories were refined and related to one another (27) (Fig. 2).

Memo-writing

The primary analyst also wrote extensive memos which documented the development of the codes, what they meant, how they varied, and how they related to the raw data (transcripts). Two types of memos were written: case-based and conceptual memos (27). Case-based memos were written after each interview – containing the interviewer’s impressions about the participants’ experiences and the interviewer’s reactions – memos were also used systematically to question some of our pre-existing ideas in relation to what had been said in the interview (Table 5). Conceptual memos, on the other hand, were a form of (1) making sense of initial codes; (2) examining participants’ meanings; (3) understanding processes, including when they occurred and changed and what their consequences were. In these memos, data was compared to find similarities and differences (Table 6).

Results

During interviews, participants shared their stories at length – they had a clear understanding of what the process of “becoming a regular user of TMP” entailed and provided a detailed narrative of such process. Participants’ narrative revealed three distinct periods of their lives: (a) experiences of oral disease before TMP, (b) efforts made while introducing TMP into their daily oral hygiene routines and (c) experiences of oral health after becoming a regular user of TMP (Table 7).

At the beginning of the study, it was clear that participants had different reasons for being recommended TMP; the number of years they have been using the product also varied (Table 1). While reasons to start applying TMP contrasted, participants’ understanding of the consequences of oral disease, oral care routines requirements and their desire for achieving oral health were particularly similar. They described their experiences of oral disease before becoming a regular user of TMP and how they felt about it, physically and emotionally. Participants compared that period with experiences of oral health after becoming a regular user of the product, and what such change meant to them. Historical, biological, financial, psychosocial and habitual dimensions of their experiences were identified (Tables 8 and 9).

Experiences of oral disease before becoming a regular user of TMP

Before becoming a regular user of TMP, participants described themselves as having a “damaged mouth” with “vulnerable teeth, dry mouth and sensitivity”. Various aspects of participants’ histories were relevant: family history, personal history, and history of oral disease. Having a “damaged mouth” with “vulnerable teeth, dry mouth and sensitivity” was explained by these historical elements (Table 8).

Participants, who had grown up without having access to a dentist or who were not encouraged during childhood to take care of their teeth, revealed disappointment about “not doing enough tooth brushing”

and requiring restorative treatment when they eventually visited a dentist. According to them, having a “damaged mouth” had serious effects including not being able to “chew anything without a bit breaking off”, being unable to afford restorative treatment, needing “repeated fillings” and “believing this was common”.

Barriers to changing daily routines

There were three main barriers: difficulty to make it a daily habit, the cost of purchasing it and TMP not being available for buying at a nearby pharmacy/chemist.

The difficulty of starting a new habit was clear for all participants, but among the various reasons one stood out, life itself and its unexpected events including illness, divorce and death of a loved one:

“My TMP use was sporadic for about two months. I wouldn’t use it for one week, the next week I’d use it once, and in the following week I might use it two or three times. Suddenly, I became a patient [oral and throat cancer] and I’ve never been sick in my life, so it was like “Why me?” ... Yeah, so difficult initially to get into the routine, then also my mother passed away, my marriage broke down and I became deeply depressed. It was tough. So, to be honest, to put something extra on the routine was a pain. It became another chore; extra mouth hygiene became annoying. It was hard, and only when the depression started to lift, I saw the importance of looking after my teeth again”. ID6

Participants also talked about where they purchased TMP (e.g. at dental practices or from online dealers) and how much they paid for it at different locations. Cost was clearly defined as a barrier:

“I used TMP very sporadically because I thought it was a bit expensive, and then probably it wasn’t until about five years after that, I started using it regularly.” ID4

“Obviously, the cost is something that most people, including myself, find it difficult.” ID11

Few participants were happy to purchase TMP from their dental practice; others shifted to online purchase given the price difference between the two settings. While some wished they could purchase TMP from a nearby chemist, not having that as an option was also defined as a barrier:

“It would be so much easier if you could buy it at a chemist”ID12.

“The fact that you could only buy it from the dentist sort of made it a hassle to acquire.” ID7

The Process Of Becoming A Regular User Of TMP

Despite encountering initial barriers, once being prescribed TMP by a dental professional, a three-fold process of change was initiated: starting a new oral hygiene routine, persevering daily and experiencing reinforcing outcomes (Table 7). This process led to a fundamental lifestyle change with five types of outcomes: historical, biological, financial, psychosocial and habitual. Participants transitioned from

having a “damaged mouth with vulnerable teeth” to having “a comfortable mouth with strong teeth”; at the same time participants felt empowered by this newly found status of being able to “keep their teeth for life”.

Facilitators for changing daily routines

During this process of change, participants identified key facilitators for changing daily routines to include TMP application. These included seeing the long-term positive effects of TMP, seeing research evidence that TMP works, TMP being endorsed by their dentist, being educated by the dentist/dental team on how to apply the product and having the support of a family member.

Participants were drawn to the product because it gave them an option apart from restorative care. Seeing concrete long-term positive effects of TMP in their mouths was a revelation, which positively reinforced daily application of TMP.

“Seriously, for the first time in my life, after about two years of using it [TMP], I sort of realised that I hadn’t had a new cavity, a broken tooth, for two years.”ID12

They also spoken about how seeing research evidence that TMP works was important to believe in the product and to start applying it.

“The community health dental team were the ones who convinced me that it [TMP] worked. They showed me a lot of research evidence, which showed how well TMP worked and everything, so that was it then; I was sold”. ID4

Equally important was to have dentists and dental team advocating the product and educating participants on how to use it:

“My teeth were just on the verge of breaking and he [dentist] said to take this TMP; he explained the chemistry behind it and how it can rebuild your enamel, and how to apply it. I took that tube, I brushed my teeth normally, then I applied TMP every day for almost a year. And then when I went back to the dentist, my enamel was all healed and stronger. So, I swear by the stuff [TMP]. So, even though my teeth are strong now, I go to the oral hygienist once a year and because my teeth are so good, he says he doesn’t need to see me, but I go to the oral hygienist just to get my teeth cleaned, and that is when I buy my TMP.” ID3

For one participant, it took a while to become a regular user of TMP but having her husband’s support made it happen.

“My husband has encouraged me - he’s taken an interest there. And that is nice, you know. He understands that I need to spend the money and spend the time.”ID10

For another, it was about his parents taking the time to find a “different kind of dentist”, a dentist who “would not just fix teeth”:

“When I was younger, I went to the dentist near where I live but, about ten years ago, my parents found a different dentist: he was good. He was kind of different from other dentists; he would not just fix your teeth. He was more about looking at how to prevent deterioration in your mouth. At that time, he said take this product [TMP] to rebuild your enamel.” ID9

Experiences of oral health after becoming a regular user of TMP

After becoming a regular user of TMP, participants no longer felt that their fate was to have a “vulnerable mouth” (and all its consequences), as they were able to achieve tangible lifestyle changes. The dimensions shown on Table 8, which had a deteriorating effect in participants’ life, were altered and reinforcing outcomes started to be noticed (Table 9). Participants realised that their dental history had changed: their teeth were stronger, less sensitive and did not require frequent restorations. Participants linked these clinical outcomes with a newly and invigorating emotional status of “feeling complete” – feeling complete or being complete simply meant they considered their body was whole and healthy because their teeth could be maintained and would not be missing from their mouths. Being complete enabled participants to enjoy life and smile again. Participants stated that applying TMP is “tooth protection” that one can do at home. So, applying TMP became part of their life and it was comparable to daily exercise and eating healthy meals. While reflecting about the reinforcing outcomes noted after becoming a regular user of TMP, participants referred to TMP as “being an essential part of their life”.

Discussion

Transferability of findings and limitations of the study

As with all qualitative research, opinions about the transferability of findings to other locations rely on understanding the context of this study. This was a study of regular users of TMP in Australia. Participants in this study were regular Australians, who were used to visit a private dental practice once to twice a year for check-up appointments. When restorative treatment was required, participants faced a financial burden. The above described participants characteristics are like the Australian average (1–4).

As in all qualitative research, the participants in this study were invited to participate because they were expected to share a wealth of information, rather than being representative

of a wider population. As previously discussed, the sample was made of consumers from the BreezeCare Oral Health Company: they had been purchasing TMP regularly for at least 6 months prior to recruitment. Among participants, we noted different reasons for applying TMP (e.g. dry mouth, dental caries, dentine hypersensitivity). While reasons to start applying TMP contrasted, the aspiration for being free from oral disease associated suffering was central to participants TMP story. All things considered, as in most research, there may be some selection bias resulting from participants having to actively choose to participate in this study and to reply to the invitation email.

Brief overview of findings and relevance to the dental literature

During this study, we developed a better understanding of how participants experienced oral disease and oral health. Historical, biological, financial, psychosocial and habitual dimensions of participants' experiences were revealed (Tables 8 and 9). We saw marked differences between participants' experiences prior to becoming a regular user of TMP and after having done so. It was clear that participants went through a process of change: without exception, they described experiencing a profound change in their oral health and in their quality of life because of that. Among other things, this process entailed (1) being encouraged to make a change, (2) accepting that an additional step was required (applying TMP daily after tooth brushing) and (3) abandoning old beliefs, such as being comfortable with requiring repeated restorative treatment while believing that was a common occurrence when visiting a dental practice (*"Isn't a filling what everyone gets when visits a dentist?"* ID12).

This study confirmed that a series of barriers can be encountered when one is asked to change oral hygiene routines. However, despite the existing barriers, modifications occurred and were strongly linked to participants having support from a dental professional. While the focus of this study was not on the relationship between dental professionals and patients, it was evident that the quality of such relationship was essential for participants being encouraged to modify their daily routines. Participants talked about the value of TMP being prescribed by a dentist and at the same time being educated by dentists and members of a dental team on how to apply the product. It is well established in the literature that dentists' and dental team members' attitude towards patients can impact on treatment acceptance and home care compliance (9, 31–34). In this study, finding a "different kind of dentist" who would not only "fix teeth" meant that participants found someone who was dedicated to help them reach a status of having a "comfortable mouth with strong teeth". Participants explained that a "different kind of dentist" was one who took the time, showed and explained to them TMP research findings and how the chemistry behind TMP "works" – these were effective facilitators of change.

Marital status was also important during this process of change: having a supportive partner made it easier to become a regular user of TMP. Accordingly, previous research suggested that marriage supports maintenance of healthy oriented activities (35, 36). In this study, we considered marital status not only as socioeconomic status, but as a source of social and physical support. Our findings indicate that partners can provide encouragement during the process of becoming a regular user of TMP. Similarly, previous evidence showed that having a partner as a source of support increases motivation for better oral care (37). However, our findings also demonstrated that participants who were single parents or divorced lacked social support to change oral hygiene routines.

Compliance versus Adherence

At the beginning of this study, we wrongly assumed that individuals' compliance would be key for becoming a regular user of TMP. Throughout the study, we have learned that becoming a regular user of

TMP required a lot more than simply following dental professionals' recommendations and instructions. Adhering to a new oral hygiene routine meant that participants in this study took an active and independent role in their oral health care. During the process of becoming a regular user of TMP, participants understood the significance of applying TMP daily. Rather than being obedient and having a passive role, they took control of their oral health care: they faced and conquered a series of barriers, they made the most of facilitators of change and, at the end, they were able to achieve encouraging outcomes.

Conclusion

When TMP was recommended and participants started applying it, they recognized the enormous disparity between life as they knew it (before TMP) and life after becoming a regular user of TMP. This change was described by all participants in the study. Before TMP, signs and symptoms of oral disease were very familiar to them. Individuals were living with "vulnerable teeth" which were brittle, painful, and/or sensitive; some had a dry mouth which led to more discomfort. Participants were used to visiting a dental practice, expecting a restoration at every appointment, and paying the price. It was not a happy life and the simple thought that life could be different did not even cross their minds.

When TMP was first recommended to them, despite not being pleased with the possibility of "keep losing teeth", incorporating an additional step into their oral hygiene routine was not straightforward - as it is expected with any change of habit. However, they knew something had to shift, if they sincerely wanted to keep their teeth. Feelings such as anxiety, uncertainty, determination, confidence, and reassurance were part of such process. So, when for the first time during a dental appointment, restorative treatment was not necessary, individuals were astonished by it. They suddenly realised it was a consequence of them becoming a regular user to TMP – it was their accountable daily actions that made it possible. From that moment on, TMP effectiveness was cemented in their consciousness. Hence, experiencing tangible results in their mouths was crucial for truly believing in TMP. Participants described themselves as being responsible for this highly valued status of having a more "comfortable mouth". They felt empowered by the sense that they would be able to "keep their teeth for life".

We conclude that, based on the findings of this study, participants seeing concrete results in their mouths and experiencing a more "comfortable mouth" boosted adherence to daily applications of TMP, which was maintained overtime. Such knowledge provides an important interpretive context for key research-proven benefits of TMP and can assist dental professionals when recommending TMP to their patients.

Abbreviations

TMP: GC Tooth Mousse Plus; CPP-ACP: Casein phosphopeptide–amorphous calcium phosphate.

Declarations

Ethics approval and consent to participate

Ethics approval was obtained from the Human Research Ethics Committee at the University of Melbourne (HREC ID: 1748963). All participants provided written informed consent.

Consent for publication

Not applicable.

Availability of data and materials

Study data and materials may be made available on request with the appropriate human research ethics committee approval and with the consent of the participants.

Competing interests

AS is an employee of GC Australasia Dental PTY Ltd.

Funding

The authors received no financial support.

Authors' contributions

AS, GGA and ECR have made substantial contributions to conception and design of this study. AS carried out data collection, analysis, and interpretation of data. AS, GGA and ECR have been involved in drafting the manuscript and revising it critically for important intellectual content. AS, GGA and ECR read and approved the final manuscript.

Acknowledgements

We thank participants for their invaluable contributions to the study. We also gratefully acknowledge the support of Mr Stephen Haynes during this project.

References

1. ADA. Australia's Oral Health Tracker Adults : Australian Dental Association Accessed 16 March 2020.
ADA. Australia's Oral Health Tracker Adults: Australian Dental Association; 2018.
<https://www.ada.org.au/Dental-Professionals/Australia-s-Oral-Health-Tracker/Australia-s-Oral->

- Health-Tracker-Adults/ADA_AHPC_oralhealthtracker2018_adults_08032018.aspx. Accessed 16 March 2020.
2. AIHW. Australia's dental generations: the National Survey of Adult Oral Health 2004-06. Canberra: Australian Institute of Health Welfare; 2007. <https://www.aihw.gov.au/reports/dental-oral-health/australias-dental-generations-survey-2004-06/contents/table-of-contents>. Accessed 16 March 2020.
 3. AIHW. Oral health behaviours in the Australian population 2004-06. Canberra: Australian Institute of Health Welfare; 2009. <https://www.aihw.gov.au/reports/dental-oral-health/oral-health-behaviours-2004-06/contents/summary>. Accessed 16 March 2020.
 4. AIHW. Oral health and dental care in Australia [Internet]. Canberra: Australian Institute of Health and Welfare; 2019. <https://www.aihw.gov.au/reports/dental-oral-health/oral-health-and-dental-care-in-australia/contents/introduction>. Accessed 16 March 2020.
 5. Wilson TG. Jr. Compliance and its role in periodontal therapy. *Periodontol 2000*. 1996;12:16–23.
 6. Wilson TG. Jr. Supportive periodontal treatment introduction–definition, extent of need, therapeutic objectives, frequency and efficacy. *Periodontol 2000*. 1996;12:11–5.
 7. Wilson TG. Jr. How patient compliance to suggested oral hygiene and maintenance affect periodontal therapy. *Dent Clin North Am*. 1998;42(2):389–403.
 8. Silverman S, Wilder R. Antimicrobial mouthrinse as part of a comprehensive oral care regimen: Safety and compliance factors. *J Am Dent Assoc*. 2006;137:22-S6.
 9. Sbaraini A, Carter SM, Evans RW, Blinkhorn A. Experiences of dental care: what do patients value? *BMC Health Serv Res*. 2012;12(1):177.
 10. Reynolds EC. Casein phosphopeptide-amorphous calcium phosphate: the scientific evidence. *Adv Dent Res*. 2009;21(1):25–9.
 11. Lapenaite E, Lopatiene K, Ragauskaite A. Prevention and treatment of white spot lesions during and after fixed orthodontic treatment: A systematic literature review. *Stomatologija*. 2016;18(1):3–8.
 12. Imani MM, Safaei M, Afnaniesfandabad A, Moradpoor H, Sadeghi M, Golshah A, et al. Efficacy of CPP-ACP and CPP-ACPF for Prevention and Remineralization of White Spot Lesions in Orthodontic Patients: a Systematic Review of Randomized Controlled Clinical Trials. *Acta Inform Med*. 2019;27(3):199–204.
 13. Bijle MNA, Yiu CKY, Ekambaram M. Calcium-Based Caries Preventive Agents: A Meta-evaluation of Systematic Reviews and Meta-analysis. *J Evid Based Dent Pract*. 2018;18(3):203 – 17.e4.
 14. Wu L, Geng K, Gao Q. Early Caries Preventive Effects of Casein Phosphopeptide-Amorphous Calcium Phosphate (CPP-ACP) Compared with Conventional Fluorides: A Meta-analysis. *Oral Health Prev Dent*. 2019;17(6):495–503.
 15. Yengopal V, Mickenautsch S. Caries preventive effect of casein phosphopeptide-amorphous calcium phosphate (CPP-ACP): a meta-analysis. *Acta Odontol Scand*. 2009;67(6):321–32.

16. Bader JD. Casein phosphopeptide-amorphous calcium phosphate shows promise for preventing caries. *Evid Based Dent*. 2010;11(1):11–2.
17. Lopatiene K, Borisovaite M, Lapenaite E. Prevention and Treatment of White Spot Lesions During and After Treatment with Fixed Orthodontic Appliances: a Systematic Literature Review. *J Oral Maxillofac Res*. 2016;7(2):e1.
18. Ekambaram M, Mohd Said SNB, Yiu CKY. A Review of Enamel Remineralisation Potential of Calcium- and Phosphate-based Remineralisation Systems. *Oral Health Prev Dent*. 2017;15(5):415–20.
19. Tao S, Zhu Y, Yuan H, Tao S, Cheng Y, Li J, et al. Efficacy of fluorides and CPP-ACP vs fluorides monotherapy on early caries lesions: A systematic review and meta-analysis. *PLoS One*. 2018;13(4):e0196660.
20. Pithon MM, Baiao FS, Sant'Anna LID, Tanaka OM, Cople-Maia L. Effectiveness of casein phosphopeptide-amorphous calcium phosphate-containing products in the prevention and treatment of white spot lesions in orthodontic patients: A systematic review. *J Investig Clin Dent*. 2019;10(2):e12391.
21. Asokan S, Geethapriya PR, Vijayasankari V. Effect of nonfluoridated remineralizing agents on initial enamel carious lesions: A systematic review. *Indian J Dent Res*. 2019;30(2):282–90.
22. Ma X, Lin X, Zhong T, Xie F. Evaluation of the efficacy of casein phosphopeptide-amorphous calcium phosphate on remineralization of white spot lesions in vitro and clinical research: a systematic review and meta-analysis. *BMC Oral Health*. 2019;19(1):295.
23. Al-Batayneh OB, Al-Rai SA, Khader YS. Effect of CPP-ACP on *Streptococcus mutans* in saliva of high caries-risk preschool children: a randomized clinical trial. *Eur Arch Paediatr Dent*. 2019.
24. Fernando JR, Butler CA, Adams GG, Mitchell HL, Dashper SG, Escobar K, et al. The prebiotic effect of CPP-ACP sugar-free chewing gum. *J Dent*. 2019;91:103225.
25. Barbosa JG, Benetti F, de Oliveira Gallinari M, Carminatti M, da Silva ABD, Lopes INI, et al. Bleaching gel mixed with MI Paste Plus reduces penetration of H₂O₂ and damage to pulp tissue and maintains bleaching effectiveness. *Clin Oral Investig*. 2020;24(3):1299–309.
26. Alexandrino LD, Alencar CM, Silveira A, Alves EB, Silva CM. Randomized clinical trial of the effect of NovaMin and CPP-ACPF in combination with dental bleaching. *J Appl Oral Sci*. 2017;25(3):335–40.
27. Charmaz K. *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis*. London: Sage; 2006.
28. Sbaraini A, Carter SM, Evans RW, Blinkhorn A. How to do a grounded theory study: a worked example of a study of dental practices. *BMC Med Res Methodol*. 2011;11(1):128.
29. Guest G, Bunce A, Johnson L. How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. *Field Methods*. 2006;18(1):59–82.
30. Sturges JE, Hanrahan KJ. Comparing Telephone and Face-to-Face Qualitative Interviewing: a Research Note. *Qual Res*. 2004;4(1):107–18.

31. Fox C. Evidence summary: what do we know from qualitative research about people's care-seeking about oral health? *Br Dent J.* 2010;209(5):225–31.
32. Lahti S, Tuutti H, Hausen H, Kaarlanen R. Patients' expectations of an ideal dentist and their views concerning the dentist they visited: do the views conform to the expectations and what determines how well they conform? *Community Dent Oral Epidemiol.* 1996;24(4):240–4.
33. Flink H, Tegelberg A, Arnetz J, Birkhed D. Patient-reported outcomes of caries prophylaxis among Swedish caries active adults in a long-term perspective. *Swed Dent J.* 2016;40(1):101–10.
34. Flink H, Tegelberg A, Arnetz JE, Birkhed D. Patient-reported negative experiences related to caries and its treatment among Swedish adult patients. *BMC Oral Health.* 2017;17(1):95.
35. Zheng H, Thomas PA. Marital status, self-rated health, and mortality: overestimation of health or diminishing protection of marriage? *J Health Soc Behav.* 2013;54(1):128–43.
36. Finkel D, Franz CE, Horwitz B, Christensen K, Gatz M, Johnson W, et al. Gender Differences in Marital Status Moderation of Genetic and Environmental Influences on Subjective Health. *Behav Genet.* 2016;46:114–23.
37. Tenani CF, De Checchi MHR, Bado FMR, Ju X, Jamieson L, Mialhe FL. Influence of oral health literacy on dissatisfaction with oral health among older people. *Gerodontology.* 2020;37(1):46–52.

Tables

Due to technical limitations, Tables 1-9 are provided in the Supplementary Files section.

Figures



Figure 1

GC Tooth Mousse Plus®

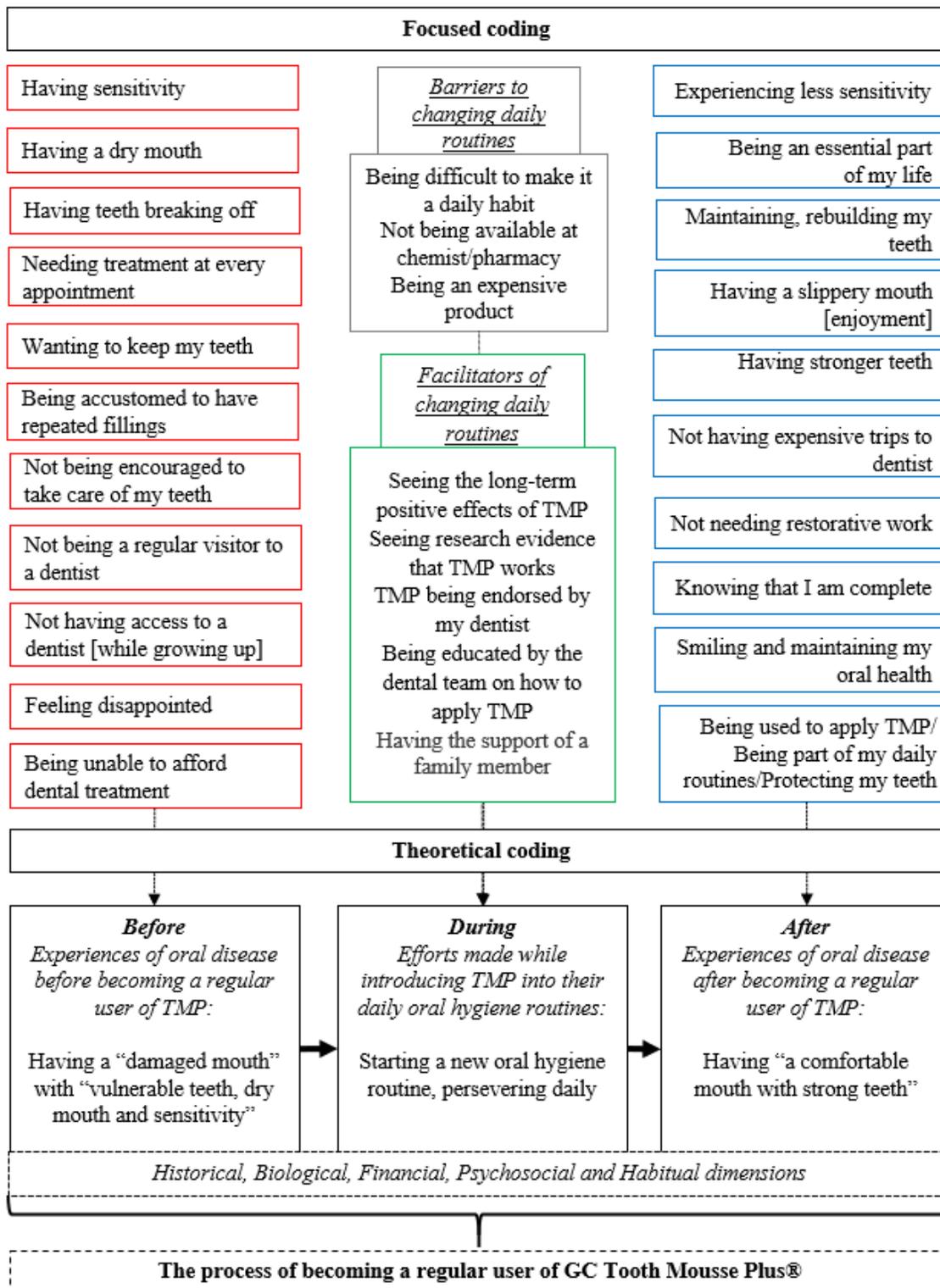


Figure 2

Coding tree

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Tablesrevised13May2020.pdf](#)
- [ISSMCOREQChecklistconvertedSbaraini.docx](#)