Exploring the Oral Health Attitudes and Practices of Adolescent Mothers: A Case Study.

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Abstract

The purpose of this research is to explore the factors influencing oral health attitudes and practices of adolescent mothers. The New Zealand (NZ) Ministry of Health (MOH) has identified adolescents as a priority group, yet disparities still exist in oral health outcomes and access to services for children and adolescents. There has been little research conducted in this field in recent times, so it is timely for this contemporary research to take place. Internationally maternal oral health is well researched with a focus largely on prenatal care. This research aims to examine issues specific to adolescent mothers' oral health and the complexities of these young women achieving positive oral health outcomes, for themselves and their children, as these can be indicators of future oral health needs. A case study methodology was used to enable a close examination of the oral health experiences of a specific group of participants who are linked together through attending a teen parenting unit at their secondary school in Auckland, NZ. Nine adolescent mothers were recruited and consented to participate in a written questionnaire and an individual interview using semi-structured questions. Data was analysed using thematic analysis to generate, analyse and report on the key themes found. The key themes identified were: 1. Adolescent mothers' oral health attitudes and practices, 2. Experiences of oral health care, 3. Factors influencing oral health outcomes and 4. Oral health knowledge and literacy. Prompted to tell her own oral health story each young mother detailed her oral hygiene practices and the importance placed on the teeth of their children. While many of these young mothers self-reported good oral health, attendance for routine dental appointments and toothbrushing practices, they all had challenges with access to dental services largely due to a lack of time, availability, and cost. In addition, this study found oral health practitioners were not the primary source of oral health knowledge, rather this information came from a range of formal and informal education, including family conversations and health professionals. This finding suggests there is a role for schools, and other health professionals, to play in providing more formal oral health education for adolescents to improve oral health outcomes. Further research into collaborative education is warranted.

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signature Date: 23 May 2022

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Ethics Approval

Ethical approval was granted on 27 May 2019 by the University of Technology Ethics Committee AUTEC: Reference 19/177 **(Appendix A).**

Chapter 1 Introduction

This chapter begins with a background and rationale of oral health services in the context of Aotearoa New Zealand (NZ) with a focus on the Ministry of Health's identification of adolescents as a priority group for oral health. Survey data about the oral health of the nation is rapidly becoming outdated and despite a reorientation of community oral health services, adolescent utilisation of oral health care remains an issue. The researcher's position is outlined as well as the research question. The context of the research is explained as well as an overview of the thesis chapters.

1.1 Background and Rationale – New Zealand Oral Health Services

1.1.1 The availability of oral health care in Aotearoa New Zealand

In NZ oral health care for adults is available through both private and public providers, with most adults paying privately for oral health services. There is only a limited range of funded oral health services for those with medical conditions and disabilities through the public hospital system or subsidised emergency dental care, for pain relief or extractions (Counties Manukau District Health Board, 2005; Ministry of Health, 2019c). In contrast, eligible children and adolescents have access to free dental care from birth up to the age of eighteen years. Despite receiving free dental care, cost has been regarded as a barrier by adolescents and the lack of publicly funded services for adults reinforced the idea that dental care is a luxury for those who can afford it (Fitzgerald et al., 2004).

1.1.2 What is known about the oral health of New Zealand?

The Ministry of Health published a vision for 'Good oral health for all, for life' (Ministry of Health, 2006b), stipulating the need for research to support change. Research about the oral health and oral health behaviours of Māori, Pacific, minority groups, older adults, and pre / post-natal women was encouraged. To do this, the 2009 NZ Oral Health Survey was commissioned, to be conducted on a ten-year cycle (Ministry of Health, 2010). Oral health had improved for NZ adults since the previous oral health survey with the lifetime experience of dental caries (tooth decay) for those aged 20 to 24 years having almost halved from 1988 to 2009. However, there were still concerning levels of oral diseases, with 35.3% of adults over the age of eighteen, experiencing untreated

caries in one or more teeth and large numbers experiencing periodontal disease (Ministry of Health, 2010). The oral health survey found fewer than half (47.1%) of adults aged 18 and over had visited a dental professional in the previous year (Ministry of Health, 2010), further decreasing to 46.6% in 2018/19 (Ministry of Health, 2019a). While younger adults (18-24 years) had a higher prevalence (77%) of having visited a dental professional in the past year this may be skewed by the inclusion of visits made while still eligible for publicly funded care. 10.2% of adults (aged 18-64) had taken an average of 2.1 days off work or school in the past year with dental problems. 44.1% of adults avoided care in the past year due to cost (Ministry of Health, 2010).

The oral health status of adolescents was not reported in the NZ Oral Health Survey conducted in 1988. By 2006, the MOH had identified children and adolescents as a priority group (Ministry of Health, 2006b). The 2009 oral health survey extended its reach to include adolescents and found disparities existed in oral health outcomes and access to services for children and adolescents, especially if they identified as Māori and/or Pacific people or people living in areas of higher social deprivation (Areai et al., 2011; Ministry of Health, 2006b, 2010; Public Health Advisory Committee et al., 2003). These children were less likely to have accessed services or met toothbrushing recommendations (Ministry of Health, 2010). Only 61.3% of children (aged 5-17) were caries free in their permanent (adult) teeth with 7.6% of children having untreated caries in one or more permanent teeth (Ministry of Health, 2010).

There is a clear consensus about the impact of poor oral health on children among researchers. A systematic review into oral health and school performance reported children with one or more carious teeth had a higher probability of poor school performance and attendance (Bessa Rebelo et al., 2019). Similarly, Gussy et al. (2008) found poor dental health in childhood, could result in pain, affect growth, quality of life and potentially be an indicator of future dental problems. Watt et al. (2019) concur with oral diseases being a cause of pain, infection, and affect quality of life. The cost of treatment is a burden met by households and health systems. This view is supported by Moynihan et al. (2018) who reported dental caries is expensive to treat, costing 5-10 percent of healthcare budgets.

1.1.3 Reorientation of child and adolescent oral health services

One of the action areas published in 'Good oral health for all, for life', was to reorient child and adolescent oral health services and reduce inequalities in outcome and access to services (Ministry of Health, 2006b). The Ministry of Health (2019b) spent $198 million in 2017-2018 on oral health services. Over $140 million was spent on Community Oral Health Services (COHS) and adolescent services (Clarke, 2019). This has seen an investment in infrastructure, with new community and mobile clinics and delivery models (Ministry of Health, 2019b). There were previously 922 school based dental clinics, representing only 45% of schools, however these were only open on average sixty days per year. The reorientation saw an upgrade of equipment and the opening of 177 community clinics and 143 mobile units (Institute of Environmental Science and Research (ESR), 2016). An evaluation of the reorientation by parents showed work and other commitments resulted in their children failing to attend appointments. Research indicates some parents may not rate the importance of baby teeth since those teeth will fall out anyway (Broughton et al., 2014; Health Promotion Agency, 2018). This may contribute further to failure to attend dental appointments.

Re-orientating child and adolescent oral health services was intended to result in a seamless service without the clear demarcation seen between preschool, school, and adolescent services, ensuring access to oral health services for all young people (Ministry of Health, 2006b). The use of regional adolescent coordinators to raise awareness of oral health services available should have seen greater uptake amongst adolescents (Counties Manukau District Health Board, 2005). This should include those adolescents under eighteen years of age and eligible for publicly funded services who are in employment or alternative forms of education or training and engaging with other primary health care providers such as maternity services. Instead, the use of oral health services declined in adolescence (Koopu & Boyd, 2009). All this comes at a time when adolescents may have specific needs, potentially higher rates of caries, periodontal disease, and trauma. These may be accompanied by other complexities including poor nutritional habits, use of tobacco, alcohol, and pregnancy (Murray et al., 2015). This view is shared by Silk and Kwok (2017) who highlight the teenage years as a time of independence about choices of diet and personal care but also increased rates of gingivitis and caries.

1.1.4 Adolescent utilisation of oral health services

Despite millions of dollars being spent by the Ministry of Health attempting to reorient the COHS, service utilisation statistics for adolescents remain relatively unchanged (R. Clarke, personal communication, 17 April, 2019; Ministry of Health, 2012a). In 2009, the percentage of young people aged twelve to seventeen years who visited the dentist in the past year was 79.9% (Ministry of Health, 2010). The MOH sets a target of 85% for adolescent utilisation, with statistics slowly climbing from 2004 (53%) until they reached a peak in 2013 (74%). However, they have decreased (71%) and remain unchanged from 2016 to 2019 (R. Clarke, personal communication, April 17, 2019; Ministry of Health, 2012a; T. Vail, personal communication, January 18, 2021). This indicates the need for adolescents to remain classified as a priority group. It has been reported adolescents were becoming disengaged from oral health services through poor attendance (Counties Manukau Health, 2014). Recommendations made by Counties Manukau Health (2014) were to develop adolescent appropriate oral health messages, increase patient knowledge through health literacy approaches and provide clarity around the process of enrolment. Attempts have been made to understand adolescents' experiences, beliefs, and attitudes to oral health. In NZ, there has been some adolescent research using a variety of demographic characteristics including geographic location (Otago/ Southland) (Fitzgerald et al., 2004; Murray et al., 2015), ethnicity (Pasifika) (Smith et al., 2019) and secondary school students (Areai et al., 2011).

While reasons for low utilisation are not always clear, suggestions to improve attendance include making clinical settings more inviting, and having oral health professionals educate in schools, communities, and the family through presentations (de Castilho et al., 2013; Smith et al., 2019). The role of family, friends and the community has been identified as a factor in both promoting and limiting access to dental care (France et al., 2017). People with favourable dental beliefs from adolescence to adulthood had fewer missing teeth, less periodontal disease and better oral hygiene and self-related oral health (Broadbent et al., 2006). Physical appearance appears to be a motivator for adolescents to care for their teeth (Fitzgerald et al., 2004; France et al., 2017). Similar findings about appearance, looking good, or having a nice smile, were found in parents of pre-schoolers in NZ. The narrative though revealed findings were linked to a desire for their children not to be marginalised or shamed (Roguski &

McBride-Henry, 2020). Access to care by adolescents still appears to be a significant problem (Areai et al., 2011; Roguski & McBride-Henry, 2020; Smith et al., 2019), further compounded by ethnic inequalities (France et al., 2017). Furthermore, there appears to be limited research or at least a lack of currency of research into the needs of adolescents as an at-risk group.

1.2 Researchers Position and Background

I graduated with an undergraduate diploma in Dental Therapy from the University of Adelaide in the 1990's and worked in the public sector for the Department of Health, in Tasmania for two years after graduation before returning to NZ to settle. I was soon disillusioned with the school dental service in NZ as it lacked the resources for oral health education and placed restrictions on preventive therapies. The provision of little more than remedial restorative care conflicted with my training and professional ethics. Soon after I sought alternative employment in private practice as an orthodontic auxiliary until joining the Auckland University of Technology (AUT) Oral Health Department in 2009 as a practice manager. During my time as a practice manager, and with no recency of dental therapy practice, I sat and passed my registration examinations to apply for registration as a Dental Therapist. I also undertook further graduate and postgraduate studies at AUT and started supervising students as an educator in the Buckland Road oral health clinic. The clinic is situated in Mangere, South Auckland and provides oral health care to adolescents from year nine up to their eighteenth birthday.

As practice manager of the clinic part of my role was to co-ordinate appointments with a secondary school and ensure enrolled adolescents were examined and any follow up preventive and treatment requirements were met. In NZ, District Health Board (DHB) funded services are provided under the Combined Dental Agreement (CDA) for adolescents aged from school year nine up to their eighteenth birthday (Ministry of Health, 2021b). Despite access to funded services, many adolescents failed to attend the oral health clinic for a routine examination, yet alone for prevention or treatment. While oral health services are funded, barriers to accessing oral health care persist (Areai et al., 2011; Smith et al., 2019).

For several years now I have been involved with tertiary teaching and learning. Much of this has been in oral health education and promotion. Despite the improvements in

preventive and treatment strategies, oral diseases are still prevalent worldwide and across the lifespan. Despite the complexity of oral diseases, I firmly believe something else needs to change to improve people's attitudes, behaviours, and oral health outcomes. I believe education is the key to that success. My research, teaching, first-hand experiences, and observations of vulnerable community groups in the wider Auckland region leads me to believe further investigation into the attitudes and practices of adolescents is needed to ensure access, engagement, increased knowledge, and positive oral health outcomes are achieved.

1.3 Context of the Research

The specific purpose of this research is to explore the oral health attitudes and practices of adolescent mothers. In NZ, oral diseases like dental caries remain a burden to the public as they persist as one of the most prevalent chronic diseases (Ministry of Health, 2010, p. 1). It is recognised childhood oral health status has the potential to impact overall health and well-being as well as be an indicator for adult oral health (Gussy et al., 2008; Yumiko et al., 2011). There is a concern for pregnant or parenting adolescents, should they lack education and access to oral health services, this will compound oral health issues into adulthood. It may also increase the risk of adverse outcomes for their children, since NZ has some of the highest rates of adolescent pregnancy in the developed world (Education Review Office, 2018; Ministry of Health, 2006a). If a mother's oral health status is a determinant of child oral health, women's education could aid efforts in reducing oral disease and ill health in children (FDI World Dental Federation, 2014). However, research indicates there is a lack of oral health education during pregnancy, except for an awareness of basic oral hygiene (Chia et al., 2015).

In NZ, the MOH and Ministry of Education (MOE) offer support to pregnant and parenting adolescents to continue their education. Education can influence a shift in the standard of living for adolescent mothers (Pio & Graham, 2018). Education providers include alternative, mainstream, or teen parent units (TPU's) (Education Review Office, 2018). TPU's function as part of a host school and the MOE now funds 22 units nationally including 'Eden Campus' in Auckland. Similar teen support organisations exist world-wide with a focus on education, childcare, transport as well as other health or social services (Pio & Graham, 2018). These services were described by Vaithianathan et al.

(2021) as standard curriculum plus pastoral care, lifestyle advice and links to community programs and health care.

> More than just a school, a TPU is a community of young women with the same goal – to finish their secondary education and provide future opportunities for themselves and their child. The nurturing environment allows pregnant and parenting young women a chance to identify, reach and exceed their academic, emotional, and social goals. To develop skills for effective parenting by learning to make choices that have positive effects on their lives (Association of Teen Parent Educators New Zealand, n.d-a, para. 2-3).

When children are healthy, the mother, who is often the primary caregiver may have more time for other activities and productivity (FDI World Dental Federation, 2014). This could have a long-term financial impact on the mother (Gibb et al., 2015).

1.4 Research Question

The research question for this study was: 'What are the oral health attitudes and practices of adolescent mothers?' The attitudes and practices will be explored by identifying the adolescent's current oral health status and oral health literacy. Aims of the research are to explore what adolescent mothers know about oral health and practices and to identify barriers and enablers to improve oral health outcomes for adolescent mothers. In addition, a further aim was to make recommendations to address opportunities for oral health service delivery and policy. Ideally this will also contribute to research into pre-school oral health and improving oral health status.

1.5 Overview of the Thesis

This thesis is presented in six chapters. Following on from this introduction is chapter two, the literature review. The literature review begins broadly by defining oral health before examining oral diseases with a focus on dental caries across the life course. Risk factors, the role of sugar as well as prevention of caries are discussed. The focus is on a specific group; pregnant or parenting adolescents and the impact on oral health, by identifying national and international research on maternal oral health as well as gaps in the research. Given the participants of the study are parenting while attending secondary school, the role of oral health education and oral health literacy are also explored. Chapter three presents the methodology employed in this study. An overview

is presented of the methods used including a description of the participants, recruitment, ethical considerations, data collection and analysis. Chapter four presents the findings of this study. Four main themes are presented, and each theme is emphasised using the verbatim words of the participants. Chapter five discusses the key findings of the case study and relates this to existing research. Any similarities or differences in findings or approach are presented at this time. Chapter six concludes the thesis, as well as describes recommendations for future research, oral health service delivery and public health policy and limitations of the study.

Chapter 2 Literature Review

This chapter defines oral health, and a link is made between common risk factors associated with oral diseases and a range of chronic diseases. Furthermore, it examines more specifically the global and national burden of dental caries across the life course. A brief overview of the aetiology of caries is presented, with the role of sugar and preventive strategies briefly outlined. The chapter then discusses maternal oral health and oral health outcomes during pregnancy, with a focus on the attitudes and practices of pregnant and parenting adolescents. Improving oral health outcomes through education and defining oral health literacy will also be explored.

2.1 What is Oral Health? – A Definition

In September 2016, a new universal definition of oral health was published by the FDI World Dental Federation as part of their 'Vision 2020 – Shaping the Future of Oral Health'. It was hoped a universal definition would provide clarity and understanding for patients, health professionals and policy makers as well as include the wider effects of oral health on general health and well-being (Glick et al., 2016). The concept of oral health has broadened and is "multi-faceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex …" (FDI World Dental Federation, n.d, para.1). Similar language was used by Peres et al. (2019) to describe the multidimensional nature of oral health; to enable eating, speaking, and socialising without pain or embarrassment. Oral health outcomes are linked to a range of oral diseases and conditions including dental caries, periodontal diseases, oral cancers, and trauma (Petersen et al., 2005; World Health Organization, 2022).

2.2 Oral and Chronic Diseases

Oral health has been linked to general health and well-being, and with risk factors contributing to other non-communicable diseases (NCDs) (Beaglehole et al., 2009; Centre for Health Care Strategies Incorporated, 2017; FDI World Dental Federation, 2014; Ministry of Health, 2006b; Petersen et al., 2005). Oral diseases share some common risk factors and determinants with a variety of chronic diseases, including

cancer, diabetes, cardiovascular and chronic lung diseases. The use of tobacco, and the intake of sugar and alcohol are major risk factors (FDI World Dental Federation, 2014; Peres et al., 2019; Watt et al., 2019). Wider determinants of health like socioeconomic status, also impact oral and general health (FDI World Dental Federation, 2014).

Sheiham and Watt (2000) suggested it was rational to use a common risk factor approach to prevent both oral and chronic diseases. The common risk factor approach to general and oral health would allow oral health professionals across disciplines to develop health promotion programmes of benefit to large numbers of people (Somasundara Yale & Kumar, 2017). Smoking tobacco is linked to the incidence and progression of periodontitis (Alexandridi et al., 2018; Leite et al., 2018) which affects the tissues surrounding as well supporting the teeth (Peres et al., 2019). Research also supports the relationship between sugar consumed and caries development (Lagerweij & van Loveren, 2019; Moynihan & Kelly, 2014; World Health Organization, 2015). Prevention of oral diseases is needed to reduce the burden placed on health services. One of the benefits of adopting a common risk factor approach would be to see a reduction in dental diseases as well as mortality rates linked to cardiovascular disease, cancer, and diabetes (Bernabe et al., 2020).

2.3 The Burden of Dental Caries – A Global and National Problem

Dental caries is a global problem affecting 3.5 billion people (Peres et al., 2019; Watt et al., 2019; World Health Organization, 2022). Similarly, dental caries is prevalent in NZ (Aung et al., 2019; Ministry of Health, 2010). In NZ significant disparities in oral health exist (Ministry of Health, 2010). Dental caries is the most common childhood disease (Aung et al., 2019; FDI World Dental Federation, 2014; Ministry of Health, 2012b; Yumiko et al., 2011) and may impact educational outcomes. Children may suffer from pain, which can cause them to miss school or lose concentration, become tired and do poorly in school (FDI World Dental Federation, 2014). Poor utilisation of community oral health services by children and adolescents has implications for oral health outcomes in adulthood.

While caries has been described as a common childhood disease (FDI World Dental Federation, 2014; Yumiko et al., 2011), there is evidence of dental caries affecting people across the life course (Ministry of Health, 2010). In young children under the age

of six years, this may present as early childhood caries (ECC), in which one or more teeth may be carious, already restored or missing due to caries (Berg & Slayton, 2016). Dental caries may then persist throughout childhood, adolescence, adulthood, and later life (Broadbent et al., 2013; Peres et al., 2019). For mothers this has implications for their children, as George et al. (2017) reported poor maternal oral health could increase the development of ECC through transmission of bacteria via saliva to the child. Iida (2017) concurred, suggesting untreated maternal caries coupled with increased salivary cariogenic bacteria will increase odds for childhood caries. This is important, since children who experience ECC are more likely to have caries later in life (Finlayson et al., 2017).

Researchers have described 'life-course epidemiology', an approach suggesting there is an accumulation of events throughout life which can lead to health effects later in life (Public Health Advisory Committee et al., 2003; Yumiko et al., 2011). This view is supported by the Ministry of Health (2006b) who state that throughout our lives there will be exposure to the environment, an accumulation of adverse health events, coupled with individual behaviours which accumulate gradually increasing the risk of chronic disease and mortality. Similar research by Broadbent et al. (2016) found beliefs, socio-economic status, self-care, attendance, and dental caries experience were factors for oral health related quality of life at age 38. A lack of understanding of the importance of baby teeth may have implications for the adult dentition, with research suggesting socio-economic status and caries experience at age five is a predictor for an individual's oral health status at age 26 (Ministry of Health, 2006b; New Zealand Government, 2018; Public Health Advisory Committee et al., 2003). Thus, the impact of oral diseases remains associated with a range of social and economic consequences (Bessa Rebelo et al., 2019; Nurash et al., 2020), as well as pain and reduced quality of life outcomes (Nurash et al., 2020; Watt et al., 2019). This is a compelling reason to argue for further research to evaluate the effectiveness of prevention and health promotion across the life course. As oral diseases are present across the life course, extending the reach of publicly funded care beyond the current age of eighteen would be worthy of further study.

2.4 The Cause of Dental Caries

Dental caries occurs when the right conditions combine to promote the breakdown of tooth structure which can lead to cavities forming in the teeth. Some microorganisms present in the plaque biofilm that populates the mouth and adhere to teeth, can cause dental caries. Certain microorganisms are cariogenic, that is, can cause caries when sugars are consumed (Meyer et al., 2021). Tooth structure is lost due to dissolution of mineral caused by acids produced during bacterial metabolism of fermentable carbohydrates in the diet over time (Featherstone, 2008). Meyer et al. (2021) concur, free sugars from our diet are a requirement in the development of dental caries since bacteria metabolise sugars, producing acid which can dissolve enamel and dentine.

Free sugars are those sugars added during cooking and manufacturing, as well as those naturally found in honey, syrups, and juices (Moynihan et al., 2018). Kidd (2005) reported sucrose is not only the most cariogenic but also the most frequently eaten sugar, therefore is an important cause of dental caries. This suggestion is echoed by Moynihan (2016) who suggests dietary free sugars are an important risk factor for dental caries. Most sugars in the NZ diet are found in sugar sweetened beverages and confectionery (New Zealand Nutrition Foundation, 2022). NZ recommendations for children aged two to seventeen years are to prepare food and drinks low in sugar and limit consumption of sugar sweetened beverages. The preference instead is to favour the inclusion of milk and water, which is preferably fluoridated (Ministry of Health, 2012b). This is consistent with international research which supports water as the beverage of choice, avoiding carbonated drinks, juices, energy, and sport drinks (Silk & Kwok, 2017). Likewise, plain water is the preferred beverage of choice for adults, despite younger adults consuming soft drinks, juice, and energy drinks regularly (Ministry of Health, 2020). The World Health Organization recommends a reduction in intake of free sugars for the health benefits of reducing the risk of obesity and dental caries (World Health Organization, 2015).

Dental caries is recognised as a multifactorial disease (Cameron & Widmer, 2013; Iida, 2017; Kidd, 2005; Young et al., 2015), moderated by complex risk and protective factors (Young et al., 2015). Cappelli and Mobley (2008) support the claim dental caries is multifactorial. Their model of causation included preventive factors offered by dental

professionals such as fissure sealants, topical fluoride application and oral health education and what they termed ‘modulating factors’. Modulating factors include socio-economic status, oral health literacy, education, and behaviours such as hygiene practices and smoking. Watt et al. (2019) also described an array of social, environmental, and individual factors as well as economic, political, and commercial determinants which may be shared with other non-communicable diseases. Likewise, the complexity of dental caries is reinforced by Young et al. (2015) who described the role of personal, biological, behavioural, and environmental factors in the severity of the disease. This lends weight to the multifactorial nature of the caries process given the right conditions and risk factors, in the absence of preventive factors. Without intervention, caries can progress until the tooth is destroyed (Young et al., 2015).

2.5 Prevention of Dental Caries: Plaque Control and Fluoride

Research indicates there is a relationship between dental caries and exposure to fluoride. Peres et al. (2019) have described the importance of fluoride exposure in the promotion of remineralisation. Yumiko et al. (2011) recommends the prevention of dental caries using fluoride toothpaste. Effective brushing with a fluoride toothpaste serves two purposes, removing plaque biofilm and applying fluoride to the teeth (Health Promotion Agency, 2015). Proliferation of plaque biofilm occurs when teeth are not cleaned adequately or frequently enough (Meyer et al., 2021). A systematic review and analysis into maternal and child oral health by the Murdoch Children's Research Institute (2008) reports the decline in dental caries is primarily due to the use of fluorides rather than a reduction in sugar consumption. In NZ only 43% of children and adolescents aged 2-17 years brushed their teeth twice daily with a fluoride toothpaste (Ministry of Health, 2010).

For children, the MOH recommends parental assistance with brushing until around the age of eight or nine (Ministry of Health, 2021a). The literature suggests parents are not meeting recommended guidelines for supervising children’s tooth brushing. In a study of parents of pre-schoolers aged 12-24 months in rural Victoria, Australia, over fifty percent of parents felt children should be able to brush their own teeth by the age of four years. Roguski and McBride-Henry (2020) found parents across NZ described a supervisory role in their children's oral health, with some ceasing to be directly involved

in their child's oral health from the age of two years. This lack of parental involvement in children's oral hygiene practices may reflect a parents own oral hygiene practices. Two-thirds (65.3%) of adults were brushing twice a day with a fluoride toothpaste in 2009 (Ministry of Health, 2010), which had reduced to 62.2% in a 2018/19 survey (Ministry of Health, 2019a).

2.6 Maternal Oral Health

Links between oral health, general health, and well-being have been made in the field of maternal oral health. Globally, maternal oral health has been linked to negative pregnancy outcomes (FDI World Dental Federation, 2014; George et al., 2017; Murdoch Children's Research Institute, 2008; Russell & Mayberry, 2008; Vamos et al., 2015; Wagner & Heinrich-Weltzien, 2017). In addition, research suggests maternal oral health is associated with the potential for poor oral health outcomes for their young children (George et al., 2017; Iida, 2017). This view is supported by the Public Health Advisory Committee et al. (2003), who highlight the importance of maternal oral health in the biological role in commencement of caries in preschool children. Mothers who utilise oral health care regularly have been found to be more likely to take their children for care (Finlayson et al., 2017; Rigo et al., 2016), therefore, ensuring access to oral health services should benefit both mother and child.

Overseas findings show dental education and oral health care is both safe and necessary throughout pregnancy (Russell & Mayberry, 2008; Vamos et al., 2015). Yet Claas et al. (2011) found in their study in Wellington, NZ, only a third of the participants had seen a dentist during their pregnancy. The reasons cited by participants included they felt oral health care was not deemed necessary, was costly and some believed dental care is not recommended during pregnancy. In addition, it has been suggested practitioners were reluctant to provide care during pregnancy (Iida, 2017) which may further limit dental attendance. Mothers have expressed concerns about the safety of oral care during pregnancy with studies suggesting pregnant and parenting adolescents also believed dental care could harm their unborn child (Fadavi et al., 2009; Murphey, 2013). Since dental attendance is positively linked to favourable outcomes and quality of life (Broadbent et al., 2006) the oral health of pregnant mothers could be improved through routine examination and treatment during pregnancy (Counties Manukau District

Health Board, 2005). Despite recommendations by the Ministry of Health (2006b) for research into the oral health of pre/ post-natal women, this does not appear to be forthcoming (Claas et al., 2011). As poor maternal oral health is linked to negative pregnancy outcomes and oral health outcomes for children, further research could be undertaken into funding for general dental care for pregnant women and new mothers.

2.6.1 Oral and general health outcomes for adolescent mothers

Globally, there are around 16 million births to teenage women annually (Cook & Cameron, 2017). NZ has some of the highest rates of adolescent pregnancy in the developed world (Education Review Office, 2018; Ministry of Health, 2006a), with higher rates in Māori and Pacific ethnicities. In 2017, for women aged fifteen to nineteen years, 62% of babies were born to Māori women, 25% to women who did not identify as Māori or Pacific and 13% to Pacific women (Allen + Clarke, 2019). Research indicates increased risk of complications with adolescent pregnancies. The incidence of low birthweight and preterm birth is twice as likely in adolescent pregnancies with an increased risk of pre-eclampsia (Ministry of Health, 2006a). Babies born to women under the age of twenty experienced lower birth weights compared to all NZ born babies (Allen + Clarke, 2019).

Similar findings are reported in overseas studies suggesting there are increased medical complications during adolescent pregnancy and increased risk of premature birth, low birthweight and even death (American Academy of Pediatric Dentistry, 2020). These risks may be compounded by oral diseases, particularly periodontal disease in pregnant women, which has been linked to an increased risk of adverse outcomes for baby. These outcomes include preterm birth, low birthweight and pre-eclampsia, poorer oral and general health (FDI World Dental Federation, 2014; George et al., 2017; Murdoch Children's Research Institute, 2008; Russell & Mayberry, 2008; Vamos et al., 2015; Wagner & Heinrich-Weltzien, 2017). Therefore, there is potential to improve oral and overall health and well-being of both mother and child through oral health efforts targeted at pregnant women as well as prevent complications of oral diseases during pregnancy (Russell & Mayberry, 2008).

2.7 Oral Health Attitudes and Practices of Adolescent Mothers

Currently, little is known about the oral health attitudes and practices of adolescent mothers in NZ. Similarly, during a study of pregnant or parenting adolescents in

Southwestern United States, it was reported there was a lack of research into the group's oral health experiences (Murphey, 2013). In addition, research into the oral health attitudes and practices of adolescents fails to take into consideration the unique challenges facing adolescent mothers to access services and the role mother's play in the development of appropriate oral health education of their babies and preschool children. A literature review commissioned by the MOH sought to gather evidence on improving parents' knowledge, attitudes, and behaviours on preschool oral health. It was found parents had a low level of knowledge about the practices needed to ensure good oral health for their preschool-aged children and a poor understanding of the importance of baby teeth (Health Promotion Agency, 2015). By focusing on maternal oral health, it may be possible to improve adolescent and adult oral health as well as children (Counties Manukau District Health Board, 2005). The risk factors for poor oral health status in pre-schoolers include parental education level, family socio-economic status, and maternal knowledge of oral health (Health Promotion Agency, 2015).

2.8 Oral Health Education

Oral health education may be defined as "acquisition of knowledge (information) and the development of skills (instruction), favouring a change in an individual's behaviour and attitudes, creating new values that benefit the health of the patient ..." (Bijella, 1999 as cited in Rigo et al, 2016, p.220). Claas et al. (2011) reports over fifty percent of those surveyed reported they did not have any oral health information during pregnancy. This is despite it being suggested in NZ and overseas that pregnancy is a suitable time to promote health as it is a time when women are receptive to changing health behaviours (Abiola et al., 2020; American Academy of Pediatric Dentistry, 2020; Finlayson et al., 2017; Iida, 2017; Ministry of Health, 2006a; Russell & Mayberry, 2008). In the United Kingdom, a study of pregnant women showed there was a deficiency in knowledge about oral health and a third of participants had not received any oral health education during their pregnancy (Correia et al., 2017). This is particularly concerning as adolescents may need additional support with nutritional advice, more so if their social situation is vulnerable. The Ministry of Health (2006a) suggests particular attention be given to an adolescent's adult support, financial security as well as their life skills.

A lack of oral health education during pregnancy has the potential to impact the oral health of both mother and child. There are links between the mother's educational attainment and the incidence of poor oral health in children (Chia et al., 2015; Correia et al., 2017; de Castilho et al., 2013; Health Promotion Agency, 2015). Plutzer and Spencer (2008) reports oral health education targeted at first-time mothers in Adelaide, Australia during pregnancy was effective in lowering rates of early childhood caries in children aged approximately 20 months. Good habits established in the first year of life could be maintained through childhood (Rigo et al., 2016). Of particular concern are beliefs children should only be seen by an oral health professional after the age of two, and a quarter of respondents thought children should begin brushing their teeth after two years of age (Rothnie et al., 2012). A systematic review of the literature shows education, income, and occupation are significantly associated with a greater incidence of dental caries (Costa et al., 2012). This highlights the importance of education in reducing oral diseases and addressing disparities in oral health for mother and child.

2.8.1 Oral health literacy

Oral health literacy is defined “as the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate oral health decisions” (Baskaradoss, 2016, p. 867). A higher rate of oral health literacy is associated with an increased number of natural teeth and lower rates of caries while poor oral health literacy is associated with missed dental appointments (Nurash et al., 2020). Baskaradoss (2016) also linked poor oral health literacy with missed dental appointments, even after adjusting for demographic and other factors.

Literature suggests an educative role for health care professionals other than oral health professionals, who may have more frequent contact with mothers and parents of young children; therefore, it is feasible they could provide education and motivation to adopt early toothbrushing habits using fluoridated toothpaste (Gussy et al., 2008). This is echoed by Yumiko et al. (2011) who suggests paediatricians have access and opportunity to address oral health issues and therefore should be familiar with interventions before children require dental services. Schools have been suggested as a venue to reach receptive children and adolescents to promote oral health (FDI World Dental Federation, 2014). Moynihan et al. (2018) suggest oral health practitioners should be part of the planning or implementation of school activities. Maintaining oral health and controlling

at risk behaviour would also require supportive school policies, a conducive physical environment as well as health education (FDI World Dental Federation, 2014).

The health, attitudes and behaviour of the mother may contribute to oral health behaviour in children particularly relating to nutrition, accessing dental services, and aiding with oral hygiene practices (Correia et al., 2017; de Castilho et al., 2013; Public Health Advisory Committee et al., 2003; Wagner & Heinrich-Weltzien, 2017). Despite this, Vamos et al. (2015) discovered few oral health promotion opportunities available during pregnancy, and those available focused on the child's oral health rather than the pregnant woman. Even fewer specifically addressed oral-related symptoms, oral hygiene practices, and potential oral-systemic outcomes in pregnant women. There is a need for comprehensive oral health promotion and education for both mother and child since caries levels in adults are linked to social disparities in the access and uptake of oral health care in children under the age of five. As a result, addressing disparities to access by young children, can have a positive impact on their dental health later in life (Ministry of Health, 2006b).

2.9 Conclusion

Considering the multifactorial nature of dental caries qualitative research may provide an insight into the complex personal, biological, and environmental factors which influence dental caries (Young et al., 2015). Some research has explored oral health attitudes of adolescents, however there is a lack of research involving adolescent mothers, particularly in NZ. What research has been done has primarily focused on oral health knowledge and practices, rather than beliefs and attitudes that may underpin practice (Roguski & McBride-Henry, 2020). With a lack of research in a national context, global data was also examined. International sources mainly focussed on the lack of understanding about the safety of oral health care during pregnancy and the links between poor oral health and adverse outcomes for babies. Research is limited on the educational, social and health benefits of continuing oral health education for parenting or pregnant adolescents. Furthermore, existing research often relies on surveys to assess parent/caregiver's responses. Although this form of analysis is useful for understanding demographic trends, it fails to account for the richness of lived experiences when it comes to caring for a child's oral health. Research has examined the

provision of dental education in pre- and post-natal care; however, the role of oral health education and literacy was not well explored and is worthy of further study.

Chapter 3 Research Methodology

This chapter begins with the positioning of the researcher in this field of research and goes on to give an overview of case study as the chosen methodological approach. The chapter will then examine the research design and the participant recruitment process. The participants are a small group of pregnant or parenting adolescents completing their secondary school education. The process by which these participants were recruited is described along with a discussion of the prevalent ethical considerations: consultation, consent, confidentiality, and anonymity. The chapter also includes a description of the methods used to gather the data set, namely questionnaires and semi-structured interviews. Quality criteria and rigour are presented, together with an overview of the analytic method of thematic analysis.

3.1 Epistemological Positioning of the Researcher

The epistemological position of an interpretivist paradigm is subjective. The way in which knowledge is acquired and validated is not generalisable, much like case study methodology is not generalisable, as it is bounded by place, time, or context (Baxter & Jack, 2008; Creswell, 2013). The participants of this case study are quite unique as they are either pregnant or parenting adolescents who attend Eden Campus teen parenting unit seeking to continue or resume their secondary education, therefore the findings from this research are not generalizable. However, readers of this study may see similarities or differences in their own context. The researcher collected data at the participants' school campus which was important to the context of the case study and supported the need for the participants to be both interested and hospitable to the inquiry (Crowe et al., 2011). Data is generated by interaction between the researcher and participants indicating a level of connection between both parties and immersion in the field. Stake (1995) suggested an "ongoing interpretive role of the researcher is prominent in qualitative case study" (p.43) and the interpretive role is critical to knowledge production (Stake, 1995). Lincoln, Lynham and Guba (2011) as cited in Harrison et al. (2017) suggested interpretivists support the notion there are multiple realities and meanings which exist, but these are co-created by the researcher. This meaning is socially constructed as meaning is influenced by people and our experiences through social interaction.

3.2 Ontological Position

As researchers, we hold certain ontological stances; beliefs about reality, how it exists and what is known about it. Ontology expresses a view of the world and what constitutes reality (Takahashi & Araujo, 2019). This influences the research, the choices of methodology, methods, and data analysis. My ontological position of interpretivist research is relativism (Levers, 2013; Scotland, 2012); which holds a view of reality which "entirely depends on human interpretation and knowledge" (Braun & Clarke, 2013, p. 27). It is important to acknowledge the role of the researcher, not only in the co-creation of meanings but in their observations and interactions with participants. In interpretivist studies, therefore, not only is the interaction between researcher and participants accepted, but the role of the researcher is also emphasised so long as it is recognised (Elshafie, 2013). This so-called reflexivity is an awareness of one's background, experience, or culture which in turn affects the way in which the case study is explored and reported on (Eusafzai, 2014).

3.3 Case Study Research

This qualitative research uses case study methodology. Qualitative methodologies are used when the researcher wants to gain a deep, rich contextual knowledge of the subject. Case studies are applauded for their ability to generate data, which is in-depth, about a particular phenomenon (Merriam, 2009). This knowledge can be pursued through the research methods guided by the philosophical viewpoint of the researcher and the research methodology. According to Creswell (2013), case study "explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information … and reports a case description and case themes" (p. 97). It has been suggested case study has the advantage and versatility to accommodate the researcher's philosophical position (Harrison et al., 2017) and embrace different epistemologies (Yin & Campbell, 2018).

A case study methodology was chosen due to its applicability across a variety of subject areas including education and health care (Harrison et al., 2017) as well as, for its empirical nature of inquiry. Case study methodology "investigates a contemporary phenomenon within its real-life context and addresses a situation in which the

boundaries between phenomenon and context are not clearly evident." (Yin & Campbell, 2018, p. 15). The use of case study as an approach is useful when asking questions about how, what, or why? (Crowe et al., 2011). Regardless of the field of study, case studies provide a means to help understand social phenomena while also retaining a holistic, real-world perspective (Yin & Campbell, 2018).

Stake (1995) further defined three categories of case study research. One of these, *intrinsic*, is about understanding the case and what is happening for the participants in a particular time and place (Baxter & Jack, 2008; Cousin, 2005; Stake, 2003). It is called intrinsic:

> …if it is undertaken because, first and last, the researcher wants better understanding of this particular case. Here, it is not undertaken primarily because the case represents other cases or because it illustrates a particular trait or problem, but because, in all its peculiarity and ordinariness, this case itself is of interest (Stake, 2003, p. 136).

In this research, an intrinsic approach allowed the researcher to take on an exploratory stance to a unique case of interest, which sought to understand 'what are the oral health attitudes and practices of adolescent mothers?' It is not the purpose of case studies to make gross generalisations (Takahashi & Araujo, 2019).

3.4 The Case Study

In this research the case was a group of adolescent women in Auckland who were not only balancing the challenges of secondary schooling and everyday life but were also either pregnant or parenting. In this case study, the participants could be bound by context, time and place and this assists with focussing the research question (Baxter & Jack, 2008).

> A case study tends to be *bounded*, which means that it is focused and intensive as well as narrow in scope. It also means that the case has clear boundaries or limiters. If a case is bounded, then there should be a finite number of people who might be interviewed, a finite number of documents to be reviewed or a finite number of observations that might be made (Savin-Baden & Major, 2013, p. 154).

Eden campus is a teen parent unit (TPU) located in Mount Eden, Auckland whose host school is Auckland Girls' Grammar. Eden campus offers NZ national certificate of

educational achievement (NCEA) curriculum. In addition, students have access to careers advice, counselling as well as social workers, a variety of health practitioners and an on-site early childcare centre. The unit educates students in school years nine to thirteen, up to the age of nineteen who wish to achieve their secondary education while pregnant or parenting (Association of Teen Parent Educators New Zealand, n.d-b). At the time of the research design there were likely to be ten to fourteen students enrolled at the campus. With a small number of students, it was planned all enrolled secondary students from the age of sixteen and over would be invited to participate.

3.5 Demographic Profile

There were nine participants aged from sixteen to nineteen years who participated in the research. Participants who consented were all female, adolescent secondary school students who were pregnant or mothers attending Eden campus. One fifteen-year-old was excluded as consent was obtained only from those aged sixteen or older. Only one student omitted her age on the questionnaire. Eight participants had one child, ranging in ages from three months to four years, with one sixteen-year-old having two children. One sixteen-year-old was 38 weeks pregnant at the time of the interviews. Most participants were non-smokers with two classifying themselves as social smokers.

Table 1 *Participant Demographics*

Participant	Age	Ethnicity	Child's age(s)
P1	Not answered	Samoan / Niuean	7 months
P2	16	New Zealand European / Tongan / Other	19 & 7 months
P3	16	New Zealand European	2 years
P4	16	Tongan /Māori / Niuean	pregnant
P5	17	New Zealand European / Māori / Niuean	6 months
P6	17	New Zealand European	16 months
P7	17	New Zealand European / Māori	4 years
P8	18	New Zealand European / Māori	3 months
P9	19	New Zealand European	1 year

3.6 Recruitment of Participants and Ethical Considerations

Recruitment of a small cohort of students for the case study took place at a secondary school in Auckland, NZ. Due to the age of the participants to be recruited for this

research, and to fulfil ethical considerations, an initial consultation was made with the campus' head teacher who had verbally agreed to work with the researcher. Written assent was then gained from the head teacher, to undertake research with the Mount Eden campus students **(Appendix B)**. Further consultation with the head teacher was held during the ethics approval process. This was to ensure the values, practices, and beliefs of all participants would be respected, and the research approaches were appropriate. Recruitment of participants only occurred after ethical approval was gained from AUT University's ethics committee (AUTEC).

An appointment time was scheduled for the researcher to visit the campus to discuss the research proposal in an environment familiar to the potential participants. This was a time convenient to the school, where it would have minimal impact on the students' daily lessons. As the researcher and interviewer, I met with the students to discuss the purpose of the research and answer any questions from potential participants. During the visit, interested participants were given a participant information sheet **(Appendix C)** and consent was obtained. The participants information sheet and consent process were designed to be transparent and rigorous. Participants were free to ask questions about the research and were free to decline to participate or withdraw from the research without repercussion. By presenting this information about the research and collecting data in the participants own familiar environment it was anticipated the participants would feel they were in a safe space and able to be honest and frank in their answers.

3.6.1 Ethical considerations

The application for ethical approval to the Auckland University of Technology Ethics Committee (AUTEC) was received in May 2019. Ethical approval was granted on 27 May 2019 by AUTEC: Reference 19/177 **(Appendix A)**. An ethical consideration raised by AUTEC was for participants to be informed the interviews will happen at school during normal school hours. A consultation was carried out with the campus head teacher to discuss assent and recruitment. The main ethical considerations were the provision of participant information, gaining consent and the management of confidentiality and anonymity.

3.7 Consent

The adolescent mothers were made aware of this research project during the participant information presentation. The information was supported by the AUTEC approved participant information sheet **(Appendix C).** Participants were free to take away the information to review in privacy but were also given the opportunity to consent to participate at the information session. AUTEC approved consent forms **(Appendix D)** were completed before participants were able to participate in the research. A copy was supplied to each participant at their interviews to keep for their own information. Participants were reminded their participation was voluntary, and they could withdraw from participating at any time. Participants were also free to change their mind from the time they completed the initial questionnaire to the individual interviews. If participants chose to withdraw from the research, they would be offered the choice between having any data identifiable as belonging to them removed or allowing it to continue to be used. A total of nine adolescents consented to participate and all completed the initial questionnaire and participated in the individual interview process.

It was intended the researcher would collect contact details to book participant interviews, but with nine participants, an appointment time was booked with the head teacher to conduct the individual interviews. Having established a rapport with the participants during the research presentation, further engagement and connection with the participants occurred during the interviews, while still maintaining professional boundaries. It was noted the potential for a power imbalance in the relationship between the participants as adolescents and students and the researcher as an academic and health professional. DeJonckheere and Vaughn (2019) remind us it is important to consider any power imbalance between the interviewer and the participant and list other issues which should be considered: “reducing the risk of harm, protecting the interviewee’s information; adequately informing interviewees about the study purpose and format; and reducing the risk of exploitation” (p. 4). However, transparency in the process leading to the data collection and clarity around the use of the data also helped manage any perceived imbalances. Aside from the question asking about ethnicity, which could be left unanswered, the participants cultural or other diversity shown will not influence the research. At all times, the participants individuality

and diversity were respected which is consistent with AUT University principles and the health practitioner's regulatory authority, Dental Council NZ.

3.8 Confidentiality and Anonymity

The security of the research data was in accordance with the AUTEC approval. All electronic data was saved onto a password protected external hard drive and the written questionnaires stored in a locked filing cabinet. The data will be stored for six years as prescribed by AUTEC and then all paper copies will be shredded, and electronic files erased. Participants were advised all the information collected will be dealt with sensitively and with discretion. The interviews were digitally recorded by the interviewer for transcription purposes and not shared. No external transcribers were used; however, they would have been subject to a confidentiality agreement. Participants were free to answer questions or decline to answer questions if they chose to. The participants were reminded the individual interviews would be conducted in a relaxed interview style, at their school, during normal school hours. Stake (2003) made the point qualitative researchers are guests, who should have good manners and a strict code of ethics.

Participants were encouraged to be frank and honest about their experiences since the data would be confidential and no names would be used. As the participants were a small, close-knit group, it was acknowledged some people might be able to guess what response a given participant said but the researcher would try to do everything to avoid this. However, it may be possible for someone to recognise another individual based on a response made in the questionnaire or interview. There is a balance needed between safeguarding the participant and maintaining the integrity of the research using rich description. Bradshaw et al. (2017) state there is a responsibility to protect the participants identity while also reporting as close to the literal participant description as possible. Subsequent interpretation of the data must relate to the research question (Bradshaw et al., 2017). No individuals are identified in this case study. To protect the anonymity of the participants, references to data from the questionnaire or the interviews in the findings and discussion chapters are identified by a participant (P) and number = P1. Information regarding confidentiality and anonymity was included in the participant information sheet.

3.9 Methods of Data Collection

Data was gathered from the descriptive statistics of the demographic data generated from the written questionnaire **(Appendix E).** Then, more detailed information about the complexities and richness of the adolescents' responses was gathered by individual interviews **(Appendix F).** Interviews were transcribed and analysed using thematic analysis. Combining data collection methods aligns well with case study methodology giving rise to both depth and breadth of data but also contributed to improving the credibility of the research (Baxter & Jack, 2008). Since interpretive research methodology and methods can be criticised for their rigor and validity, quality criteria will also be discussed in section 3.10.1 'Quality criteria and rigour'. An overview of the data collection methods, justification and administrative process follows.

3.9.1 Questionnaires

Questionnaires are a data gathering technique commonly used in qualitative research. They usually consist of demography style questions and some open or closed ended questions on a particular topic being explored. Questionnaires are relatively quick, inexpensive (Braun & Clarke, 2013) and simple ways to collect data. Questionnaires offer anonymity since face-to-face contact is not required (Kumar, 2019). To overcome any disadvantage caused by clarity around the questions asked or the appropriate use of language the questionnaire was reviewed by the research supervisors and indicative questions were approved by AUTEC. Questions were piloted on an adolescent who reported no difficulty in completing or understanding the questions asked.

The questionnaire for this research project included some initial closed questions to gather background demographic information about the participants age, ethnicity, and their children. Ethnicity was indicated using the Statistics NZ standard ethnicity collection question (Ministry of Health, 2004). In addition, the purpose of the questionnaire was to explore the adolescent's oral health knowledge, attitudes, and practices. The questionnaire was further divided into sections on general oral health as well as oral health risk and protective factors. Some questions asked were easily quantifiable, requiring satisfaction criteria (excellent, good, average, poor, unsure) to be indicated while others were more qualitative in nature. Simpler questions appeared first, then some questions were deliberately open-ended to allow the participants to

explain in their own language and to help inform the discussion during the semi-structured interviews.

In this research the questionnaire was used to collect the data from the student group, largely in one sitting following the presentation of the research proposal and participant information sheet. Some students were absent and were approached at a follow up visit and invited to participate. Data from the questionnaire was entered into a Microsoft Excel spreadsheet. Answers to open-ended questions were typed verbatim. Other background information and demographic data were used to produce simple descriptive statistics for the participants. Familiarisation with the data in the questionnaires allowed for the semi-structured interview questions to be refined, particularly the questions relating to the links between common risk factors and general health and well-being and regarding the role of sugar in dental caries.

3.9.2 Interviews

Interviews are a qualitative research technique designed to converse with participants and collect data. The purpose is to collect data from the point of the view of the participant, using their own language and explanations of their experiences and attitudes in relation to the questions. Interviews contribute toward trustworthiness when the participants own words form the data. “This involves providing an in-depth description of participant perspectives and being sure to include multiple perspectives” (DeJonckheere & Vaughn, 2019, p. 7). Using a semi-structured interview approach allowed the researcher time to prepare the questions prior to the interviews. While the indicative questions **(Appendix F)** were approved by AUTEC, being semi-structured allowed the researcher to be reflexive to the participants language and level of comprehension.

All nine students who completed the written questionnaire participated in the individual interviews. As some students were absent on the day of the interviews a return visit was scheduled and all interviews completed. The flexibility of semi – structured, open-ended questions also allowed for a more in depth understanding and richness of the data. According to Braun and Clarke (2013), where the subject is one in which the participant has a personal stake in, interviews are well suited to exploring understanding and perceptions. The interviews were designed to further explore the oral health attitudes

and practices of this case study. Through the questions, the participants discussed their experiences, current oral health status and oral health literacy. Questions related to oral diseases as well as overall health and well-being and the role of nutrition. The interviewer also asked whether oral health services in NZ were fit for purpose, about any access issues and ways to improve service delivery.

3.9.3 The interview processes

The interviews were conducted at Eden Campus, as agreed in the AUTEC ethics approval. This was deemed to be a safe, familiar environment in which to carry out the interviews. Interview dates were scheduled to provide minimal disruption to the academic day. Times to conduct the interviews were booked to minimise any disruption to the participants' schoolwork and it was envisaged these would take around thirty minutes per interview. The researcher conducted the interviews after first gaining signed consent from each participant. Participants were advised and permission was sought to record the interviews for research purposes and the content of the interviews was confidential. This information was explained in the participant information sheet disseminated at the earlier information session. The participants were reminded they could choose to not answer a particular question(s), should they wish. Not all students were at school on the initial day interviews were conducted. Two short re-visits enabled all participants to be interviewed.

A small, quiet room, away from other students was used for each interview. Each interview began with a thank you and a reminder of the purpose of the interviews / research. As each participant had signed consent at the participant information session, a copy of the signed consent was issued to each participant, with a reminder participation was voluntary. Before completing the interview, participants were asked again if they agreed to recording of the interviews according to the information provided in the participant information sheet. For the interviews, a list of indicative questions designed to answer the research question and address the aims of the research was developed and approved by AUTEC. Indicative questions were designed with a view to being adapted if necessary, depending on the responses in the oral health survey questionnaire. This would inform the final development of the semi-structured interview questions, although no changes were indicated. At the completion of the

interview each participant was thanked for their input and the data saved onto a secure password protected storage system.

3.9.4 Transcription

The interviews were short, much shorter than the anticipated thirty minutes outlined in the research proposal. They ranged from eight minutes to fourteen minutes. Each was recorded on two devices (a Sony voice recorder and a Samsung Galaxy S9 phone) in case of any technical issues with the audio recording. The semi-structured interview questions were used for transcription, but changes to the script were tracked where the question or language was modified for the participants understanding of the questions. The responses were transcribed verbatim. The researcher transcribed all the semi-structured interviews to aid with familiarisation with the data.

3.10 Data Analysis

3.10.1 Quality criteria and rigour

There are numerous approaches to achieving rigour or trustworthiness in qualitative research. Guba and Lincoln (1994) discussed four concepts for interpretive research: credibility, transferability (external validity), dependability (reliability) and confirmability. Credibility or internal validity is demonstrated when the findings accurately represent the data (DeJonckheere & Vaughn, 2019). This can be improved by establishing trust, rapport and expressing empathy with participants (Bradshaw et al., 2017) through participant information sessions or the interviews, themselves. Data triangulation (the use of many sources of data) has been proposed as a strategy to improve a study's internal validity (Crowe et al., 2011). Multiple data sources or triangulation, thick, rich descriptions and reflexivity contribute to interpretation. Confirmability examines whether the findings may be biased by the researcher (DeJonckheere & Vaughn, 2019) and they are representative of the participants using direct quotes (Bradshaw et al., 2017).

3.10.2 Thematic analysis

A reflexive, thematic analysis was the analytic method used to generate, analyse, and report themes from the data sets (Braun & Clarke, 2006, 2020). The approach followed a blended six-phase approach to analysis described by Braun and Clarke (2006, 2020)

through familiarisation with data, generating initial codes, searching for themes, reviewing themes, defining, and naming themes and producing the report. An inductive approach was used, with data analysis not following existing theory, but instead shaped by the researcher's point of view, knowledge, and epistemology. "Despite not having *inbuilt* theory, TA can never be conducted in a theoretical vacuum; researchers always make assumptions about what data represent ..." (Braun & Clarke, 2020, p. 10).

3.10.3 Familiarisation with the data

Initial familiarisation occurred after the questionnaire, during entry into Microsoft Excel and used to gauge the level of oral health education, attitudes, and practices to inform the semi-structured questions. Immersion with the data continued while the researcher carried out the transcription of the interviews while listening and relistening to verbatim interviews to ensure accuracy of the transcriptions. Ongoing familiarisation with the data occurred when the responses from each participant were entered into a table using Microsoft Word, so data could be viewed at one time. This familiarisation provided opportunities to notice data of interest or specific issues. This led to groupings of words, common phrases, short sentences, and ideas into a list of potential codes.

3.10.4 Generating initial codes

Coding allowed data related to the research question to be identified. Complete coding was used across the entire data set to identify all items of interest or data that may be relevant to answering the research question (Braun & Clarke, 2013). Colour coding of the data was carried out manually using a table in Microsoft Word. Initially the indicative interview questions were included, and each participant's corresponding responses added in columns. The questions were then removed, and coloured fonts or highlighting used to make it easier to identify words, phrases, differences, similarities, patterns, and ideas. A further column was then added to generate initial codes using simple phrases or words. To maintain focus the researcher reflected on the research question; "What are the oral health attitudes and practices of adolescent mothers?" These codes were therefore data-derived codes or semantic codes, based purely on what the participants said. An element of researcher derived, or latent codes also occurred since the researcher has made some assumptions about what is said in the data. Braun and Clarke

(2013) suggest the separation between semantic and latent codes is not pure, and codes may have elements of both.

3.10.5 Searching, reviewing, and naming themes

Once all the data had been initially coded, further analysis allowed for a systematic approach to identify frequent, important, and meaningful patterns across the data set (Braun & Clarke, 2013). Without access to a printer (during the Covid-19 lockdown) several soft-copy lists of codes were created. The list of codes was hand-written onto cards and manually laid out to create a mind map **(Appendix G)** to help identify themes. "Themes in reflexive TA are patterns of shared meaning, united by a central concept or idea" (Braun & Clarke, 2020, p. 341). Themes were identified, then reviewed and refined, and the resulting map was reproduced using Microsoft Visio. This aided in the visualisation of the overarching themes, themes, and sub-themes in relation to the original research question and aims. Braun and Clarke (2013) point out these visual maps can be a useful aid to exploring the relationships between the codes and various themes and subthemes. A meeting was held with the researcher's supervisors to discuss the themes generated and it was noted during the writing of the findings that some sub-themes may become redundant or overlap other sub-themes. This idea is supported by Braun and Clarke (2006) who suggested "some initial codes may go on to form main themes, whereas others may form sub-themes and others still may be discarded" (p. 90).

3.10.6 Producing the report

This phase involved final analysis as well as to describe the complexity of the case study data set for publication or scholarly reporting. Braun and Clarke (2006) stress the importance of providing a "concise, coherent, logical, non-repetitive and interesting account of the story the data will tell – within and across themes" (p. 93). For each theme, the researcher returned to the mind map identifying the key themes and sub-themes and then back to the columnated data set. This contained extracts from the original transcripts which enabled the process of reporting the findings by telling the participants stories using narrative contained in the transcripts from the interviews. The narrative used in the discussion chapter honours the data, maintains anonymity but creates interest through use of the original words of the participants.

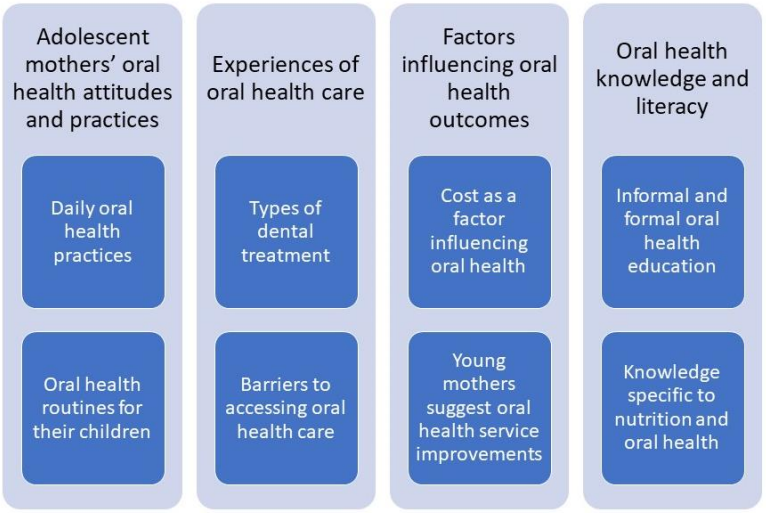
3.11 Conclusion

This chapter focussed on discussing case study methodology and the methods used to answer the research question and address the aims of the study. The chapter gave an overview of the research study design, including the participants, their recruitment, ethical approval, and consultation process. Data collection was described, including the participant information process and consent. The data collection methods of questionnaires and semi-structured interviews were outlined as well as how the data set from the methods employed were analysed using thematic analysis. The findings from the analysis are presented in chapter four.

Chapter 4 Findings

This chapter provides a rich overview of the participants experiences of oral health services and their oral health attitudes and practices. These 'thick descriptions' emanating from the data typically align with case study research (Merriam, 2009). The data collected from questionnaires and interviews of adolescent mothers is presented thematically to allow the voices of the participant to be clearly visible to the reader. Every effort has been made to conceal the identity of the participants using a simple numerical identification system connected to the participant number. Thematic analysis of the data identified four key themes along with several sub themes as illustrated by the figure below. The figure below provides an overview for the reader of the themes presented in more detail within the chapter.

Figure 1 A visual representation of the findings themes and subthemes



4.1 Adolescent Mother's Oral Health Attitudes and Practices

4.1.1 Daily oral hygiene practices by the participant

All the participants reported they brushed their teeth twice a day, although one amended this by adding 'when I remember' and most brushed their children's teeth (if they had teeth) twice daily. One participant who regularly brushed her child's teeth was less consistent with her own brushing:

> *… probably for me, it's probably like once a day, or twice to be honest. I try to remember and stuff … I normally do it like in the mornings ...*

> *obviously after breakfast and before you go out, but sometimes at night I just fall asleep sometimes and forget. Like baby, finally put her to sleep and I just fall asleep (P1).*

All participants were using toothpaste for themselves and knew either the brand, or a specific ingredient of their toothpaste. An array of toothpaste products was used by the group, including 'Colgate®', a baking soda paste by 'Red Seal®' (non- fluoridated), coconut oil paste, and a charcoal paste. Although tooth brushing practices were regular, this was not the case with flossing, with only four participants flossing regularly, three 'sometimes' and two not at all. Varied reasons were given for flossing habits including the cost of dental floss.

4.1.2 The importance placed on children's baby teeth and oral hygiene

All participants rated baby teeth as very important, the highest of the satisfaction criteria. Despite this, only two participants had taken their children to an oral health practitioner. The importance the participants placed on their children's baby teeth may have been reflected in their children's brushing practices. Most of the participants used toothpaste when assisting their children to brush their teeth with most choosing to use a paste for infants/children such as 'Colgate Baby®' and 'Grin®' brands. Only one participant was not using toothpaste for her child. Opinions differed amongst participants about the age they should be assisting children with brushing their teeth. Three participants did not know the age recommended by the Ministry of Health (Ministry of Health, 2021a) or New Zealand Dental Association (New Zealand Dental Association, n.d) to support and supervise children's brushing. The participants responded with an age range from five months to six years. One participant asked:

> *when is it … the most important time to start … really … brushing my son's teeth because he doesn't eat that much sweet stuff yet … and he doesn't really let me brush his teeth that well. I get the back and front and stuff but … I don't know. I don't know … is it … so important for me to start like thoroughly brushing his teeth now? (P9).*

Some participants gave descriptions of the ways they engaged their children with brushing based on routine and having fun. One participant was using a silicone finger brush with her child: *"… every night and morning I brush my … she's nine months, so I brush her teeth with a silicone rubber brush … that you put on your finger, and you can brush their gums" (P1).* Her daughter had ten teeth, *"she started getting teeth really*

early, so she's got a lot, she eats more food than she drinks. She eats a lot of food so you gotta brush it quite regularly" (P1). Two participants accounts were of their children loving to brush with one participant establishing a routine for mother and child to brush together: *"…he loves brushing his teeth, so whenever in the morning and at night-time I go to brush my teeth he'll … run after me and we will do it together" (P6).*

Another participant usually brushed in the mornings with her four-year-old daughter, but she described:

> *… if we are in a rush, then obviously we can't do it. But she gets this little chart from her Kohanga, and it has … morning and night and she likes putting it on the bathroom wall. She'll get her pen and she'll tick it … so we like to do that in the morning and at night (P7).*

One participant was brushing her one-year-old son's teeth in the morning and night but stated:

> *I'm trying to teach him to do it himself and then for myself, I … just brush my teeth in the morning and sometimes during the day. Depends if I've eaten and then at night, I … floss and then brush my teeth and then use a charcoal powder (P9).*

Creative tactics were being used by another participant with her son (two and a half years) who liked to brush his teeth first himself:

> *… he'll have a turn and then I'll say OK now it's my turn and he'll be like, no, and now we are going to get … and I'm gonna tell him what we had for dinner and I've got to get this off your teeth, broccoli or whatever, and he goes … broccoli, and now he thinks back to what he had for dinner and he goes, broccoli and chicken and then he goes … telling me to get it all off his teeth and I go OK. So now he likes it cos he's like oh yeah, we're getting everything off my teeth (P3).*

4.2 Experiences of Oral Health Care

Participants had varied experiences related to their interactions with oral health practitioners, dental clinics, and their staff. Other factors including the clinics administration contributed to the participants oral health care experiences. At the time of data collection, only one participant had not seen an oral health practitioner in the past year, with three attending a dental appointment once and the rest two or more times. Interestingly, although most of the participants reported good oral hygiene

practices and rated the health of their teeth and mouth compared to others their age as 'about average', and one as 'better than most', numerous treatment interventions were reported in their interviews.

Around half of those who attended a dental appointment went for a routine examination while the others attended for pain, problems, or other treatment. One participant claimed her teeth were pretty good, *"It's gotten way better … when I was younger, I just hated the dentist so I wouldn't do it" (P9).* When questioned further about her past dental experiences she recalled at around age six or seven having a general anaesthetic to have dental treatment carried out; *"like it was so bad to go to the hospital, so I just started … cooperating" (P9).*

One participant expressed a positive view of health practitioners in general:

> *Well, I like the dentist, I like the doctors, I like everything … like how people are scared of it ... I'm not scared of it … Yeah, like getting the injections because I don't like needles but going and seeing them, I don't know, I think it's because my teeth aren't bad so I'm not worried that anything is going to happen (P3).*

One participant suggested *"… clinics are just kind of like boring, like, not boring, but like you know … it's not … what's the word? Like you don't really feel like you want to be there as such" (P6).* Despite her description of clinics as unappealing places, she admitted *"I've always kind of … strangely loved going to the dentist".* When asked 'why strangely?' it appears this may be due to her lack of dental intervention:

> *… well, everybody in my family seemed to have … some traumatic experience of going. My little brother doesn't like it … but … I think it's because … I've never really been in lots of pain; I've never had a tooth removed or something like that (P6).*

4.2.1 Types of dental treatment received

The participants had varying accounts of dental treatment including extractions and restorations. Only a small number of participants gave accounts of preventive strategies employed by oral health practitioners. Participants described a mix of historical care during early childhood and more recent experiences. Four participants had histories of childhood extractions, one under general anaesthesia. When asked about her oral health experiences one participant recalled:

> *I think when I was younger … I must have had lots of sugary foods as I had to go to the dentist heaps when I was younger, and I had to get a few teeth pulled out … and since after that I think I've been OK. I haven't been to the dentist for anything … major or anything (P7).*

Similarly, while talking about her most recent restorative treatment another participant also recalled a childhood extraction:

> *… so, I recently just got three fillings … in one tooth, but … my teeth are pretty good. I've had, when I was younger, I actually had a rotten tooth and got it pulled out, because of too much candy and then I get check-ups every year with my school, for dental and then just recently about two weeks ago I got three fillings in one of my top teeth, so yeah, that's pretty much it, nothing major (P1).*

One participant who self-reported only average satisfaction with her teeth and mouth discussed persistent oral health concerns:

> *I had … heaps of holes and fillings and they just kept falling out, so I had to get them redone and then I was meant to have … what do you call it, you know when you get that drill down here … [Interviewer: a root canal?] …Yeah, a root canal, but then they … tried something else to just see if that would work, just tried filling it in, like it was a massive hole, and … because it was like just not deep enough to get a root canal they said. … Yeah, but my mouth is quite sensitive as well, when I eat, my teeth hurt, like they ache … that's with like with biscuits, like anything (P2).*

Not all participant accounts were linked to caries, but also to congenitally missing teeth, orthodontic treatment, or previous trauma. One participant had *"one tiniest filling but only one, tiny little one"* done when she was younger which had to be redone recently. Her current experiences were limited to extractions for orthodontic purposes and wearing braces on her teeth for the past two months. There was no pain which suggested a filling was required and the cavities were detected on routine examination: *"they were … you've got a little something, we're going to do a filling" (P3).* Another participant regularly attended the dentist to maintain some baby teeth due to missing adult teeth. Talking about this issue, she described a restoration which frequently needed replacing: *"I'm actually missing teeth, my adult ones never grew … I always have to make sure the baby teeth stay in until I can get a fake one and that's, so I don't get braces" (P5).* In one case the participant gave an account of her history of trauma: *"I*

knocked these two teeth out … my baby teeth and they affected my adult teeth when they grew through" (P8).

4.2.2 Barriers to accessing oral health care

The participants reported good attendance at dental appointments, although if they had missed an appointment the main reasons were due to a lack of time or the availability of appointments. A clinics' opening hours, consequences of failing to attend appointments and issues around childcare and transport were the primary concerns of participants in their experiences of accessing dental care. Other reasons participants had missed appointments were illness, or simply not wanting to go. The clinic environment also featured, with one participant describing clinics as *"all …. very sterile and clean. I guess that's how it should be" (P6)* but for people her age [seventeen], she felt clinics did not feel like places you want to be.

Residing in a teen parent group home at the time of the interviews, one participant indicated a lack of support to access oral health services was her primary concern. She felt her ability to access oral health care had been *"all over the place and … my old caregivers used to book appointments for me, and never took me" (P2).* Living in a group home added a layer of complexity for this participant, who went on to say:

> *… I'm in a teen parent home so it is quite hard because I am really busy. Like that house is really full on so I don't always have the time to go just book one when I need to. But if I am at school I can … (P2).*

Time was a common frustration to accessing oral health care, with both P6 and P8 answering, *"finding time".* P6 did not have a driver's licence either, so transport was often an issue. Another participant also struggled with having no-one to mind her baby [six months] and found a clinic's opening hours also restricted access:

> *… they're not open past ... five o'clock most of the time ... five o'clock is pretty much when everyone finishes work, and I can get someone to look after her ... obviously that's when they want to close too (P5).*

Participants discussed clinic opening hours, the limited time mobile dental services were at school and the length of time it took to get an appointment. The timeframe of how long the dental bus stayed at school and returning forms on time was an issue for one participant who had moved schools frequently (P1). When another participant rang to

make an appointment, her challenge was the wait time, *"… when we call, it's … a long waiting line … it usually takes about ten minutes at the most … with my dentist (P4).* Rescheduling also posed challenges:

> *… I reckon it's hard because of how long we have to wait … and booking in, rescheduling, because of, either I can't make it or … sometimes I don't even get seen until at least two weeks later (P4).*

Despite this, P4 was still able to be seen, whereas the participant who failed to attend appointments described restrictions being placed on her ability to make subsequent appointments:

> *... lately I've been trying to book some, but I've missed some of them and if you ... book it ... two times and then you miss them I couldn't book another one after that ... they wouldn't let me" (P2).*

4.3 Factors Influencing Oral Health Outcomes

4.3.1 Cost as a factor influencing oral health

The cost of oral health care was a key concern of the participants. Few participants felt oral health services met the needs of New Zealanders, with the exception being free dental care for those aged under eighteen years. One participant thought it was good children received free dental [care], however she was not sure the oral health needs of adults were being met. She replied:

> *I don't actually know. I just know it's pretty expensive. Yeah, and … some can't afford it, so they just don't, or they just don't … care or they just don't bother because of how expensive it is I think (P1).*

Seven participants discussed cost and a lack of money as a factor impacting peoples access to oral health care. One participant illustrated this by stating:

> *… people with not a lot of money … you can definitely notice … the difference between having money and not having money with teeth. Just, people with … not a lot of money have really bad hygiene with their teeth, like they don't see the dentist a lot. Like you can definitely tell (P5).*

Another of the participants used her dad as an example, *"… he's … got really bad teeth and he smokes and he's like I need to go see the dentist, but I don't have the money so it's … oh well I can't, because of money" (P3).*

Despite still being at secondary school, two participants aged eighteen and nineteen were no longer eligible for publicly funded dental care under the community oral health services scheme which provides free care for children and adolescents up to the age of eighteen. Both participants suggested services could be free to encourage access by families. One participant stated simply *"I don't have the money to pay for it" (P8).* Commenting on cost, the other participant described how a consultation and removal of a wisdom tooth had cost her $1500. *"I think before I turned nineteen it was really good cos everything was free … but now it's just gotten way harder because it's … so expensive" (P9).* The high cost was reinforced by another participant who stated, *"I just feel like the cost is … really, really high" (P7).* In addition, the cost of consumables could also impact oral health with the same participant stating, *"I know I need to floss, but floss is kind of expensive for me at the supermarket … Otherwise I know that I need to do it, but I haven't been lately" (P7).*

4.3.2 Cost of healthy eating and food choices for mother and baby

Concerns were also expressed by participants about the cost of healthy food compared to less healthy options. One of the participants would like to have:

> *… more … healthy foods available in supermarkets … like when you go to the checkout, having … different healthier options in the aisles, not just all lollies and stuff … You know that gets her [daughter aged four years] all when we go to the supermarket … Mum can I have some of those? (P7).*

This was echoed by P9 who said:

> *… just maybe not having juices and … sweet foods … at so many family places. Like having healthier options that you can buy easily … like the zoo … when you go there, and they just have … coke and stuff (P9).*

Two of the participants did not report issues making healthy eating choices for themselves, with one reporting a good knowledge of food and a dislike of anything but water to drink (P5). Another participant felt her diet of eating meat and three different vegetables every night for dinner was healthy (P8). However, a common view expressed

by participants were the challenges they faced making healthy food choices for their children. The key factors related to time, motivation, affordability, availability, and other people's involvement in the feeding of their children. To eat better one participant would probably stay at home more and involve family members:

> *… we make everything that she eats [daughter aged seven months] … is all homemade … my parents help me with it … so, probably … when I go out, I probably get something on the run, but when we are at home we just eat at home (P1).*

The living situation impacted the participants choices when it came to feeding their children. In contrast, two participants were living in a group home for teenage mothers, and one struggled with shared cooking routines where the cook's food preferences influenced the choice of food: *"some nights we don't get veges cos she goes nah I'm not eating them so I'm not making them" (P3).* The influence of the group home staff concerned the mother, when her son sees and wants the foods and drinks consumed by staff:

> *… every single day it's like oh another bottle of fizzy, another bottle of fizzy and then they're [staff] … eating things and my son he sees it and he's like oh I want the same and he will jump up next to them and they'll give it to him (P3).*

Like P3 though, another participant also struggled with people offering her baby *[age six months]* food to eat:

> *…even in the weekend I had people feeding her hot chips…I'm sitting there … I'm just having her food, you get lost! [laughs]. I guess for me it's mostly just other people going oooh baby … I'll give her lollies, I'll give her cake, you know? … Just that sort of stuff is probably my biggest thing and eating and I don't really like to be … 'you don't feed her', I hate doing that so that's probably my biggest thing (P5).*

Both P6 and P9 avoided giving their children sugar [aged 16 months and one year respectively], despite P6 admitting to having a sweet tooth herself. She credits her son for his love of food and not being a fussy eater. She summed it up by saying *"I just don't want him to have sugar because his teeth are coming through and I'm like no they're too precious" (P6)*.

4.3.3 Young mothers suggest oral health service improvements

While participants discussed a range of barriers to accessing oral health care, some solutions were offered. To overcome access issues for adolescents it was suggested there could be dental clinics in colleges as well as primary schools so students can attend *"even when they are at school, so they don't have to go to appointments during the weekends or after school just to make it easier to go to them" (P7).* One participant highlighted the importance of recall reminder letters to prompt her to return to a dental clinic with her four-year-old daughter:

> *… I haven't had lots of letters … to tell me that I need to come in and get her teeth checked … otherwise people wouldn't usually take their kids in if they didn't have a push for them to take them in (P7).*

One participant wanted to encourage young people to attend while care was still free, and her suggestion was to encourage attendance through a points system or free toothpaste. She also thought dental services would be more accessible to families if more emphasis was placed on how important it is to attend:

> *I can't really remember in school, that much … people coming in maybe. Telling students … why you need healthy teeth and like how expensive it can get after [they leave school]. So that kids know, cos that's probably something I didn't know until I went to the dentist just recently … kids they don't take it seriously probably and then like afterwards it's really expensive (P1).*

4.4 Oral Health Knowledge and Literacy

The participants appeared to lack knowledge about the relationship between oral health and well-being. Commenting on 'what does oral health mean to you?' one participant knew oral health was related to *"your teeth, the health of your mouth"* from what she had seen on toothpaste (P1), but limited knowledge was illustrated by mixed answers making references to teeth and gums or oral hygiene practices like brushing or flossing. One participant when asked, said *"… I don't even know what oral means, does it mean overall?" (P2).* The participants oral health knowledge was learnt through informal means, including advertising, via conversation, storytelling, and family as well as formal education routes. When participants were asked about where their oral health advice came from, the contribution made by family to the participants knowledge was also demonstrated through quotes such as:

> *"… we've had oral health students, I think that's some students, come in [to school] … Plunket … information from them. And I think just my Mum and Dad and family (P7).*

> *"My mum … Not really, just my mum … and the dentist" (P8).*

Formal oral health knowledge was provided by both health practitioners and educationalists. Surprisingly, oral health education, especially about nutrition by oral health practitioners was limited.

4.4.1 Participants thoughts about oral health and well-being

There was some confusion about 'what is oral health?' with one participant using examples from products. Oral health is *"like your teeth, the health of your mouth… it's what I see on the toothpaste" (P1).* All participant's thought diet was important for their oral health, but they were unsure why this was so. In their responses the participants attempted to make sense of this with some suggesting sugar was bad for teeth or attributed to rotten teeth. One participant suggested *"drinks (coffee, fizzies) make teeth yellow. Unhealthy foods like lollies eat your teeth" (P1).* Another participant suggested *"… sugary foods if not cleaned away can lead to decay" (P7).* One participant used advertising to describe the role of sugar in dental caries: *"I always just think to … an ad I think I've seen where … the sugar is like little bugs and they … attack" (P5).*

Two participants made a link between oral health and well-being with one stating: *"If teeth are infected and not treated, they can poison you (go into your bloodstream)" (P1).* Another participant supported this notion by saying *"you think of your body as a whole so therefore it is all connected, and the health of your teeth ultimately leads to the overall health of your body" (P7).* Two other participants related oral health to general physical appearance and how you might get treated by others. The following quotes from participants support this:

> *"Gross teeth make people think your dirty" (P5)*

> *"Because if it's sore [the tooth] it affects your ability to focus and if it [the tooth] looks funny you may be bullied" (P8).*

4.4.2 Informal education: The role of family in oral health education

Participant stories about oral health in their family showed this informal source contributed to their knowledge, as well as practices. The participant who made the link between oral health and well-being talked about her own father's experience:

> *… my dad had to have some really serious gum disease or something and all his teeth got taken out, and he's got like a full set, cos it was … getting to his heart or something. It's poison … the gum, it can poison you … and … your heart and stuff I don't really know details, because they didn't really tell me that much, but yeah, just knew something like that (P1).*

One participant had been told by the dentist to brush and floss daily as her teeth were the same as her family. *"My mum said that … her family, their teeth are … real soft, like that's just how they are" (P9)*. For that reason, her mother did not allow her to eat chewy lollies when she was younger. Another participant was critical of the role parents play in their child's oral health. She felt parents should educate their children and exercise control over their diets:

> *… just seeing my little cousins … their teeth are really bad. They've all had to be crowned, capped, it just looks hideous … I don't know, obviously it's not their fault, it's the parents for … letting them know a bit more and taking more control of … lunches (P5).*

4.4.3 Formal oral health education

Where education was given by oral health practitioners, this was largely restricted to the oral hygiene practices of tooth brushing and flossing. When describing advice from her dentist, one participant recalls being told *"… just keep brushing, … yeah that's it" (P4).* When attending the dentist, another of the participants was advised to brush twice daily, to eat healthy and to floss: *"… he just told me I should keep flossing cos why I got fillings was cos food got stuck in between and made holes or something" (P1).* One participant had been scared by the tactic used by her dentist to encourage oral hygiene practices recalling the dentist saying *"we'll remove your tooth if you don't" [brush/floss] (P5).* Another participant was advised to use a fluoride toothpaste but when I probed and asked, 'why fluoride?' she laughed while saying *"I know it does something good to your teeth, I don't know" (P3).* There was a suggestion by one participant for oral health practitioners to improve their explanations by using easy to understand language:

> *... they should improve on explaining what's going on more ... and ... using terms that we understand ... instead of saying 'oh your next appointment is this and blah, blah, blah, blah ... explain what it is ... and what has to be done (P4).*

Much of the participants knowledge about nutrition did not come from dentists but other sources who visited the school campus including nutritionists, doctors, nurses, Plunket, as well as family. Nutritionists visited the campus and spoke about eating a variety of food groups and portion sizes. Advice was also given on healthy food the participants could make. Some advice focussed on nutrition for their children, rather than the mother which may have influenced participants to adopt healthy practices for their child: *"… for my children … I know that I would need to show them it to you know influence them to do it … be healthy …" (P2).* The same participant had been told sugar was unhealthy but did not really understand why and she did not really care. When it came to her own health, she had attended courses by health professionals but liked to make her own decisions:

> *I don't really listen to it though … I like to decide what I eat … and do with my body and I tell them … you know if it happens it's my fault … like you know I've had this talk so many times (P2).*

Oral health practitioners were not a primary source of knowledge related to nutrition and oral health. Six of the participants had limited knowledge about the role of sugar as a risk factor in the initiation of dental caries. In common, participants talked about sugar making teeth rot or if sugar or food is left on the teeth this contributes to the decay process. One participant said, *"they say sugar is bad for you but what's in sugar that makes it bad? I kind of don't understand it ... sugars bad ... but ... there's gotta be stuff inside the sugar" (P2).* Another participant recalled an advertisement when answering: *"I think I've seen where … the sugar is like little bugs and they … attack … some weird ad' like that" (P5).* P4 admitted having no knowledge about the role of sugar and what it does to teeth whereas another participant attempted to answer the question with a question: *"It goes into your teeth doesn't it? Like into your gums and teeth and stuff?"* but mumbled when she admitted *"I don't know. I'm guessing" (P3).* P7 was a little more confident in her response; she knew if you ate sugar before bed it stays on the teeth: *"I think that when we eat sugary foods and you don't brush your teeth then it can cause bacteria to grow ... and then cause, I think it's called, cavities".*

4.5 Conclusion

This chapter presented four key themes: the adolescent mothers' oral health attitudes and practices, their experiences of oral health care, factors influencing oral health outcomes and oral health knowledge and literacy. The participants reported good oral hygiene practices despite a range of historical and current accounts of dental treatment received, some of which was complex including restorations, extractions, and trauma. Participant accounts described the importance of their children's baby teeth and the strategies they used to engage children in oral hygiene practices and healthy eating. Several barriers to positive oral health outcomes were identified including time factors, access to dental practices, eating a healthy nutritious diet and the costs associated with dental care. Interestingly, participants identified suggestions which might improve oral care service delivery. Finally, the findings provided an insight into the participants oral health literacy and their sources of both informal and formal knowledge.

Chapter 5 Discussion

The purpose of this case study was to explore and answer this question: 'What are the oral health attitudes and practices of adolescent mothers?' The research question and themes guide the discussion. The themes and subthemes are related and influence one another as they can be seen through the participant's experiences of oral health care as well as their sources of oral health knowledge. As a result, there may be barriers and enablers to improving oral health outcomes for adolescent mothers and their children. These factors will be discussed and may contribute to existing knowledge in this area. The analysis of the questionnaire and interview responses would appear to confirm previous research presented about the oral health attitudes and practices of adolescents, however there are added complexities for these adolescents attending secondary school while pregnant or parenting. The discussion will also address one of the aims of this study which was to address opportunities for service delivery improvement.

5.1 Adolescent Mothers' Oral Health Attitudes and Practices

5.1.1 Daily oral hygiene practices by the participants

The participants had excellent brushing practices, and all were brushing their teeth twice a day which exceeded the findings from the 2009 oral health survey where only around two-thirds of children and adolescents brushed twice a day (Ministry of Health, 2010). However, participants were using a variety of toothpaste brands and types, with only 55% using a fluoride toothpaste, which is comparable with research showing only 43% of children and adolescents aged 2-17 years were brushing with a fluoride toothpaste (Ministry of Health 2010). The findings in this case study are consistent with Murray et al. (2015) who reported in their study of year 12-13 students in Southland that knowledge of fluoride was lacking, 83.5% of females were brushing twice daily, but only 53.5% were using fluoridated toothpaste. These findings have important implications for suggestions to improve greater access to preventive strategies including professional applications of fluoride, improved access to fluoridated water and toothpaste containing fluoride.

5.1.2 Establishing a routine for children's oral hygiene

Most of the mothers brushed their children's teeth twice a day. This contrasts with Gussy et al. (2008) who reported frequency of brushing was impacted by a parent's lack of confidence to clean their children's teeth. It was heartening to see participants describe teaching their children to brush, engaging in activities such as using a brushing chart and other games to make brushing an enjoyable activity. These strategies are a source of valuable practical information for the oral health professional. Something as simple as engaging patients in meaningful conversations while taking a social and dental history could serve two purposes, building a rapport with the patient and giving and receiving of information to inform oral health practitioners in their education with other mothers.

However, it was somewhat surprising given the high importance participants placed on their children's teeth and the way in which mother's engaged with children during brushing practice, there was uncertainty expressed by participants as to how long they should support children with their brushing habits. On reflection it was disappointing to hear one participant ask: *"when is it … the most important time to start … really … brushing my sons' teeth [age one] because he doesn't eat that much sweet stuff yet" (P9).* By age one, it could already be too late with untreated disease such as ECC already present. If childhood caries is a predictor of oral health in later life (Ministry of Health, 2006b; New Zealand Government, 2018; Public Health Advisory Committee et al., 2003), oral health professionals could be committing a child to a lifetime of treatment which could be prevented through effective brushing and targeted oral health education.

Three participants did not know how long to oversee their child's brushing and other participants suggestions were well below the recommended age of eight to nine years, with six years being the oldest answer given. The Health Promotion Agency (2015) cited research demonstrating the misunderstanding surrounding when children can brush their own teeth and if fluoride toothpaste should be used. The findings agree with those obtained by Chia et al. (2015) who found 48% of respondents answered incorrectly about the age at which children should be helped with toothbrushing. In this case study, six participants were using toothpaste, one was not. These findings support evidence from a previous study which reported confusion by parents about the frequency for brushing a toddler's teeth and whether to use fluoride toothpaste (Gussy et al., 2008).

Of the participants using toothpaste for their child(ren) four were using paste designed for infants/children such as Colgate Baby® and Grin® which may have contained reduced or no fluoride concentrations. In NZ, toothpaste containing less than 1000 parts per million (ppm) fluoride concentration is not recommended (New Zealand Medicines and Medical Devices Safety Authority (Medsafe), 2017). It has been found a higher fluoride concentration in toothpaste is associated with an increased dental caries preventive effect (New Zealand Guidelines Group, 2009). The emphasis now is on using an appropriate concentration of fluoride toothpaste, with an age-appropriate amount of toothpaste based on the child's age. The findings in this case point to a need for better access to fluoride containing products for children, clearer guidelines around the safe and effective use of fluoride for pre-school aged children and education for their parents.

5.1.3 The importance of the participants children's baby teeth

All participants ranked the importance of their children's baby teeth as 'very important' which was pleasing to see as this was contrary to the findings of the HPA (2018) which found nine percent of respondents "agreed that baby teeth are not that important as they are going to fall out" (p. 36). Broughton et al. (2014) surveyed pregnant Māori women from the Waikato- Tainui region, with 23% believing holes in baby teeth did not matter since those teeth fall out. The view baby teeth lack importance is further supported by Roguski and McBride-Henry (2020) who reported a discourse amongst NZ parents / caregivers of preschool children who lacked adherence to child oral hygiene practices. The rationale related to the temporary nature of baby teeth as well as a view of adult teeth as a second chance to access care later in life. Roguski and McBride-Henry (2020) described this discourse as representative of a lack of knowledge of the need for preventive care for preschool children. The findings from this case suggest the role of the TPU, which provides education, childcare, health, and social services may positively contribute to health awareness of the participants.

Despite the importance placed on baby teeth by this case study's participants, only two had taken their children to see an oral health practitioner yet five participants had children older than one year. This finding must be interpreted with caution, as the reason for participants not taking their child to a dentist may have been related to the child's place of birth. If a child is born in one of Auckland's main hospitals, they are

automatically enrolled with the children's community dental service and will be invited to attend an appointment around age one. If participants have moved or changed telephone numbers, it can be difficult to follow up these enrolments. The reasons many of the participants had not taken their child to a dentist are unclear, however the findings suggest this may be due to a lack of knowledge by participants about when a child should first be seen. The current advice is to enrol babies early with a first visit usually occurring between the first and second birthdays (Ministry of Health, 2019c). Confusion about the age at which children should be first seen has been reported in the literature (Roguski & McBride-Henry, 2020). International recommendations by the American Academy of Paediatric Dentistry suggest a similar timeframe, with an examination no later than 12 months of age (Finlayson et al., 2017; Plutzer & Spencer, 2008).

These findings suggest several courses of action including greater education about the importance of baby teeth and the recommended age at which children should first have a dental examination. Continued efforts are needed to make oral health care more accessible to adolescents and children, including improved enrolment processes to ensure pre-school children are seen at the recommended age. For these participants this may require a commitment by healthcare and education providers to collaborate. This could see oral health education and enrolment information delivered earlier when pregnant adolescents engage with a maternity carer. In Australia an oral health service initiated by midwives was developed which provided training for oral health education, oral health screening and referral (Ajwani et al., 2019). Conversely Abiola et al. (2020) suggested oral care providers could be part of a prenatal team. There is support in NZ for collaborative practice from regulatory authorities since there is provision in NZ legislation requiring authorities to "promote and facilitate interdisciplinary collaboration and co-operation in the delivery of health services" ("Health Practitioners Competence Assurance Act 2003," s 118ja).

5.2 Experiences of Oral Health Care

5.2.1 Participant utilisation of oral health care services

The participants were aware of the importance of visiting an oral health professional. The proportion of the participants who had visited an oral health professional (88.9%)

in the past twelve months was higher than adolescents aged 12-17 years (79.9%) reported in the NZ oral health survey (Ministry of Health, 2010). The higher attendance may be related to the small sample size or that all participants in this case study are female with other studies including all genders (Fitzgerald et al., 2004; Ministry of Health, 2010; Smith et al., 2019). Research indicates females are more likely to have attended a dental clinic in the past twelve months (Areai et al., 2011; Murray et al., 2015). It may also be the participants awareness was raised during pregnancy, a time when women may be more receptive and motivated to adopt healthy behaviours (Abiola et al., 2020; American Academy of Pediatric Dentistry, 2020; Finlayson et al., 2017; Iida, 2017; Ministry of Health, 2006b; Russell & Mayberry, 2008). However, parenting adolescents may be conflicted by their independence and desire for freedom of choices concerning diet or personal care (Silk & Kwok, 2017). Counteracting that, the niche school environment provided by the TPU may have contributed to the health awareness of these participants, since the health of themselves and their babies is also a part of their education, where they have access to visiting health professionals such as public health nurses and nutritionists.

Even when taking into consideration gender, eight of the nine case study participants had attended at an oral health professional in the past year exceeding the attendance by women aged 15-24 years of age across Auckland, of whom only 62% attended an oral health practitioner in the past year (Ministry of Health, 2021c). This finding about attendance is encouraging; however, three participants were aged seventeen and two others were already no longer eligible for publicly funded dental services. This does not bode well, with these participants signalling potentially fewer dental visits in the future, which fits with reports by Murray et al. (2015) of attendance dropping away after the age of eighteen years in NZ. A decline in dental attendance aligns with reporting of older adolescents being less likely than their younger counterparts to have visited an oral health practitioner in the past year (Børsting et al., 2015). This has the potential to worsen in adulthood with only 50.5% of Auckland women aged 15 to 65 years and over attending a dental practitioner in the past twelve months (Ministry of Health, 2021c). Regardless of the reasons for non-attendance, there are two-fold reasons for improving utilisation: “improved access to dental care for young adults could also make a difference to child oral health, because young adults are frequently parents of young

children" (Broadbent, 2020, p. 8). It is important for these participants to access oral health care to improve oral health outcomes for themselves and their children as prior research supports maternal oral health as an indicator for child oral health (Counties Manukau District Health Board, 2005; Public Health Advisory Committee et al., 2003).

The reasons given for attending the dentist for approximately half of the participants were for a routine check-up, while the other half attended for pain or treatment. If participants had missed a dental appointment this was for a variety of reasons, including appointment availability, lack of time, sickness, and simply not wanting to go. Similar findings about access or being too busy to attend were reported by the Ministry of Health (2010). These findings suggest oral health service providers need to look at ways of supporting adolescent utilisation to improve attendance. Children up to the age of thirteen receive free care through community oral health services who provide ongoing enrolment information at the end of school year eight. There is currently a disconnect between an adolescent's school year and their age for eligibility to publicly funded treatment under the CDA. Adolescents are eligible from the start of school year nine up to the day before their 18th birthday, however, some students in this case study and other adolescents turn eighteen while still enrolled at secondary school. A recommendation would be to align the CDA with the school year regardless of age. Then students from year nine to year 13 would remain eligible, however this would not serve those adolescents who are eligible but no longer in school.

Adolescents from year nine can then enrol directly with a private dentist who continue to provide free care under the CDA, however, if adolescents must phone around to do this, it puts another barrier to accessing care in place. Failure by adolescents to choose a dentist could contribute to explanations for low utilisation by adolescents who need to find their own provider. There is an argument here for improved transition from community oral health services to adolescent services, or for a review of dental service agreements given the Ministry of Health's position that children are entitled to free oral health care until they turn eighteen. A further recommendation would be to increase the age limit for publicly funded treatment to capture older adolescents and provide care at a time when many are engaged in secondary or alternative education or embarking on tertiary education or employment.

Even then, enrolment does not guarantee utilisation and further initiatives may be required to improve adolescent dental service utilisation. Quantitative data of adolescent utilisation statistics is current as at 2019 (T. Vail, personal communication, January 18, 2021), but there is a lack of contemporary qualitative data. Furthermore, studies looking at knowledge, attitudes and perceptions are becoming dated (Chia et al., 2015; Murray et al., 2015). It is worth noting much of the research regarding utilisation is secondary analysis of data from existing surveys (Areai et al., 2011; Børsting et al., 2015) some of which dates back from 2007. The findings in this case study support further research to establish whether extended opening hours, increased geographical location of providers or the provision of mobile services would improve utilisation. This may also require greater uptake of contractors under the CDA. Holding a contract to provide adolescent oral health care may not be attractive to private providers who can command greater payments from fee paying patients. Completing a package of care for an adolescent under the CDA consisting of a routine examination, radiographs, prophylaxis / supragingival scale, fissure sealants, one-surface posterior restorations and preventive treatment gives the provider a payment of approximately $163 for a decile 1-3 student. This is a significant price differential to private fees with a median cost of $98 for an examination and x-rays and approximately $250 for each restoration (Consumer New Zealand, n.d). Considering data reporting adolescent utilisation was unchanged from 2016 – 2019 (R. Clarke, personal communication, April 17, 2019; T. Vail, personal communication, January 18, 2021), asking adolescents to contribute to future initiatives to re-orient oral health services could improve utilisation.

Contrary to expectations, fear did not feature strongly in this case study, yet is cited in the literature as a reason for not attending dental appointments (Murray et al., 2015). Participants described their first-hand experiences with oral health practitioners as mostly positive in nature. The participants experiences included historical accounts of restorative treatment and extractions. 44% of participants reported having had dental extractions and while all participants were aged sixteen or older, these were accounts from childhood. This finding is higher than the national data for girls aged 1-14 years, which showed 8.7% had teeth removed due to dental caries, abscess, or infection in their lifetime (Ministry of Health, 2021d). The reason for the higher rates of extractions is not clear but may be related to a surgical intervention model of care by dentists which

is centred on disease treatment rather than prevention of underlying causes of oral diseases (Watt et al., 2019). These findings have important implications for future research into dental curricula to see if a shift in focus away from the treatment of illness to a public health approach promoting healthy lifestyles and prevention of illness better meets the needs of children and adolescents.

The findings presented suggest prevention had been lacking resulting in more invasive treatment including restorations and extractions, rather than oral health education, and preventive strategies such as fluoride application and fissure sealants. A focus on prevention rather than treatment could see greater uptake of oral health care by adolescents. Silk and Kwok (2017) hold the view teenage years are a time for prevention through fluoride varnish application, fissure sealants and education in the form of motivational interviewing to reduce the risk of caries and periodontal disease. This suggestion corroborates the work of Watt et al. (2019) who suggested a shift to a team approach to public health services and a focus on prevention and health promotion rather than a focus on existing disease. Future work could examine whether non-dental health care providers who may have greater contact with adolescent mothers as indicated by the findings of this case study could potentially screen for oral diseases.

A natural progression of this work might be to see if this team approach could extend to the provision of preventive services or oral health education. Not only are preventive appointments less invasive but they can be scheduled for shorter appointments at times which are more convenient, further removing reasons for non- attendance due to lack of time. For those at increased risk of caries, fluoride is recommended as a preventive measure in both adult and baby teeth (Munteanu et al., 2022). The economy and efficacy of fluoride varnish was reported in a Cochrane review which showed an average 43% reduction in caries of adult teeth in children and adolescents (Silk & Kwok, 2017). Similar findings by Munteanu et al. (2022) also reported professionally applied fluoride is cost effective and noted varnish modalities are quick to apply. It is therefore suggested a review of the guidelines published in 2009 for the use of fluorides in NZ (New Zealand Guidelines Group, 2009) be undertaken to see if they are aligned with contemporary oral health care.

5.2.2 Barriers to accessing oral health care

While the case study findings show some barriers to accessing oral health care these were related to being a parenting adolescent, such as arranging childcare and finding time. However, these participants were able to shed some light on generalised barriers for other adolescent groups, something other research have struggled to do. While researchers agree improving oral health care access is a significant problem (Areai et al., 2011; Smith et al., 2019), solutions are not readily forthcoming. A comparison of the findings with those of other studies failed to confirm reasons for low utilisation, although de Castilho et al. (2013) and Smith et al. (2019) suggest it could be improved by making clinical settings more inviting, similarly supported by the findings in this study. Access issues relating to transport were expected and is consistent with earlier works (Ministry of Health, 2010; Smith et al., 2019). Notably, clinic administration was found to be a barrier with opening hours, clinic locations and rules about appointment scheduling confounding efforts for participants to attend appointments.

5.2.3 The oral health clinic as a barrier to accessing care

There were issues raised by one participant about the length of time it took when telephoning to make an appointment. This is concerning, given a lack of time is already a barrier to adolescents. Another participant was unable to make a subsequent appointment due to her history of missed appointments. However, a one-size fits all approach to booking adolescent appointments does not always take into consideration the reasons why adolescents may fail to attend appointments. These findings were supported by France et al. (2017) whose study shows adolescents struggle with organizing their own appointments. France et al. (2017) went as far as to suggest “in the absence of a coordinated system and with more freedom of choice during adolescence, participants who had experienced negative oral health care encounters seemed to avoid utilizing publicly funded oral health care” (p. 22). As oral health practitioners we should be breaking down barriers to access, not putting further barriers in the way of adolescents. One of the participants who had taken her four-year-old daughter to the dentist for an examination recalled not having received a lot of reminders to make an appointment. Recall reminders could also serve as an important adjunct to attendance.

Another incentive suggested by one participant was to receive free toothpaste. Preschoolers are only now in 2022 starting to see the targeted distribution of free toothbrushes and toothpaste from the Ministry of Health following the 2016/2017 marketing campaign 'baby teeth matter' delivered by the Health Promotion Agency (Allen and Clarke Policy & Regulatory Specialists Ltd, 2015). Even once participants overcame struggles with appointment making, the surgery environment was something that made an impression on the participants. Comments about the uninviting, clean, sterile environment were reminiscent of Fitzgerald et al. (2004) whose study of Otago adolescents also found clinics smelt weird and albeit a necessary feature, were too clean for comfort. All this suggests a need for a targeted service centred on the needs of the patient, and it could be as simple as asking adolescents about changes necessary to oral health services for improving access and reducing barriers.

5.3 Factors Influencing Oral Health Outcomes

There was a mix of views and actual experiences of barriers to accessing oral health care, with participants using their own stories to illustrate a point. This went further than just the perceived or actual cost of oral health services and included the cost and availability of nutritious food. Consistent with other research, a strong relationship was found between the cost of dental treatment and attendance (Fitzgerald et al., 2004; Freeman, 1999; Ministry of Health, 2010; Murray et al., 2015) even though most participants were under the age of eighteen years and still eligible for publicly funded care. Although dental care is free for this age group, Murray et al. (2015), propose the barriers to attendance may relate to knowledge, factors influencing the perceived importance of oral health, negative connotations about dentists or issues relating to transport to and from dental clinics.

Environmental issues ranged from a lack of support from well-meaning friends and family in the provision of healthy foods and beverages for the participants children, to an inability to find affordable, healthy alternatives in supermarkets and other venues. The findings also raised an awareness of other factors influencing attendance, including transport, time constraints and clinic administration. Even the clinic environment was implicated as a barrier, with participants not shying away from suggestions to improve access and appeal as well as suggesting promotion of publicly funded dental services.

5.3.1 Cost as a factor influencing oral health

The findings raised several challenges faced by participants and their families which had the potential to influence access to oral health care. The cost of oral health care featured in the participants responses. The two participants aged eighteen discussed the cost of attending the dentist now they are no longer eligible for publicly funded treatment. This cycle, where cost was given as a reason for not going to the dentist was something some participants have seen in their own families. This viewpoint was reflected in research by Murray et al. (2015) who found 90.6% of year 12 and 13 students in their Southland study thought people were put off going to the dentist because of cost. The cost of oral health care and healthy eating will increasingly become an issue, as the participants lose their eligibility for publicly funded care. This highlights the importance of prevention of oral diseases which may reduce the burden of cost once adolescents are no longer eligible for publicly funded dental care.

This may be particularly important to this case as it has been suggested becoming a mother prior to the age of twenty has a prolonged impact even at age thirty on economic circumstances (Gibb et al., 2015). The impact of the pending loss of free dental care for these participants highlights the need for policy action to fund oral health care beyond the age of eighteen since 44.1% of adults avoided dental care due to cost (Ministry of Health, 2010). One of the issues arising from the findings suggested there could be more done to promote the importance of healthy teeth, accessing services and how expensive it can be after leaving school. This was consistent with France et al. (2017) whose study of Pacific adolescents suggested school support could continue including oral health promotion and advice about free dental care.

5.3.2 Cost of healthy eating and food choices for mother and baby

One unanticipated finding of this study was the concerns raised by the participants about the environmental issues related to healthy food for their children, parental support or the lack of support, and the cost and availability of healthy food options. This was not found elsewhere in the literature on the question of nutrition, although challenging behaviours of family members was an issue reported by Roguski and McBride-Henry (2020) in non-adherence to oral health care. Participants appear to be aware of the impact of environment, but not the specifics of the role of nutrition in oral

health. Currently, nutrition in oral health literature largely focusses on the role of sugar from food and beverages in caries initiation (Lagerweij & van Loveren, 2019; Moynihan & Kelly, 2014; Peres et al., 2019; World Health Organization, 2015). Allen and Clarke Policy & Regulatory Specialists Ltd (2015) found a barrier to good oral health practices for many families was the cost of nutritious food, toothbrushes, and toothpaste.

Marketing to children in supermarkets was also discussed by participants. This finding echoes Harris et al. (2020) who reported studies show there is extensive marketing carried out in supermarkets of nutrient poor foods targeted at children. Views were expressed by participants that unhealthy foods should be more expensive than their healthy counterparts and there is a need for healthy options at public sites. Impetus is gathering as more research has emerged internationally. This has the support of 'FIZZ,' a group of NZ researchers and public health professionals who advocate to raise the cost of sugary drinks through taxes, restrictions on sales, marketing, and advertising as well as policies developed for sugary drink free workplaces and public institutions (FIZZ, n.d). In NZ, it is time to consider the role of fiscal and other policy to improve nutrition and prevent non-communicable diseases, such as sugar taxes and bans on sugary drinks at public events and in workplaces, hospitals, and community centres (New Zealand Beverage Guidance Panel, 2014; Wilson et al., 2020).

5.3.3 Young mothers suggest oral health service improvements

The participants in this case study demonstrated the impact of being time poor, a lack of transport and other barriers on their access to oral health care with the need to arrange childcare having the potential to further compound attendance. Comparable findings including wait times, clinic hours and distance were reported by Roguski and McBride-Henry (2020). There appeared to be a lack of support available to enable access to oral health care especially for those participants not living at home. For one participant, who moved schools frequently, *"the timeframe of how long the dental bus stays at school"* was an issue (P1). Another participant had suggested dental clinics be situated in colleges as well as primary schools to make attending easier while at school rather than evening or weekend appointments. However, under current community oral health services, care for adolescents is provided in specific practices and mobile dental units in some high schools /colleges. The dental provider must also hold a contract to deliver these services, otherwise they are not free of charge.

If identifying barriers to achieving positive oral health outcomes are to be addressed, a better understanding of access needs to be developed. An unexpected finding of this case study were suggestions put forward by participants to improve access to oral health care. The participants highlighted an area not currently seen in the literature with their recommendations for dental practices, including dentists talking to their adolescent patients and making them aware of the lack of free dental care after age eighteen. A natural progression of this would be to undertake further research into the community based oral health services. The move to a model where oral health care is provided in fixed and mobiles clinics may not serve all adolescents well. This may be particularly relevant for adolescents who are in alternative education arrangements, vocational training or no longer at school. Ongoing evaluation of the re-orientation of COHS is recommended with an opportunity here for adolescent groups to share their unique viewpoint and contribute to future insights and recommendations for service delivery models.

5.4 Oral Health Knowledge and Literacy

5.4.1 What is oral health?

One unanticipated finding was the concept of 'oral health' was poorly understood, with participants primarily talking about teeth and gums, or mouth health. The findings suggested participants also lacked knowledge about the relationship between oral diseases and systemic disease. This is consistent with France et al. (2017) who found Pacific adolescents did not make the connection between oral health and overall well-being. Six of the participants indicated sugar played a role in the cause of dental caries but appeared to have limited knowledge about the mechanism by which sugar contributed to dental caries. A similar finding was reported by Fitzgerald et al. (2004), who found Otago adolescents appeared to have a poor understanding generally of the mode of action of dental caries.

Participants in this case study did relate oral health to physical appearance, as did a group of Otago adolescents who were concerned with the cosmetic or appearance role of teeth (ugly teeth, bad breath) rather than function (Fitzgerald et al., 2004). Similar findings were made by France et al. (2017), in their research into Pacific adolescents' attitudes and beliefs. Their participants also echoed aesthetics – teeth make you look

good or contributed to self-esteem, confidence, and social relationships. A further study focussed on oral health literacy is therefore suggested to gain a greater understanding of how adolescents obtain, process, and understand health information to enable them to make appropriate decisions.

5.4.2 Sources of knowledge

It was anticipated this study may show exposure to advertising through platforms such as television and social media would result in greater awareness of oral hygiene products and oral health. The findings of this case study did not show this as a common thread although one participant used advertising to describe the role of sugar in dental caries. A prior study of Otago adolescents had identified the importance of media advertising of oral health care products as a significant source of information (Fitzgerald et al., 2004). Similar to findings in this case study, the Otago adolescents were not able to define gingivitis per se but were able to recite dialogue and imagery from advertisements about oral hygiene related products (Fitzgerald et al., 2004). Findings in this case study about education provided by oral health practitioners seemed to focus on the practical aspects of brushing and flossing. This finding was unexpected due to the multifactorial aetiology of dental caries and the importance of sugar in the cause of dental caries (Kidd, 2005).

Contrary to expectations, this study did not find oral health practitioners were the primary source of oral health related information. Utilisation and access to oral health services may have contributed to this finding. The findings in this study indicate most of the education by oral health practitioners was of a practical nature concerning toothbrushing and flossing. It was surprising education about nutrition was limited by oral health practitioners, despite oral diseases having a multifactorial aetiology. It was interesting to note over half of the questions by participants were nutrition related. This raises the question why the oral health profession is not taking the lead on nutrition given the role of sugar in the dental caries process. A possible explanation might be for oral health literacy efforts to extend beyond the patient to include the health care providers themselves (Nurash et al., 2020). If education is not coming from the oral health profession, then where should this come from? This is an important issue for future research into the place of nutrition in the dental curriculum, which is supported by Moynihan et al. (2018) who went as far as to say not only oral health, but all health

practitioners should receive adequate nutrition related education and recommended a review of current dental curricula in nutrition.

5.4.3 Alternative sources of oral health education

The role of the TPU in the provision of oral health-related education should be commended. This case study has shown some education about oral health and nutrition is received through the school curriculum or by visiting professionals such as public health nurses, Plunket, and nutritionists. This finding reflects those of Gussy et al. (2008) who reported other health care professionals who may have more frequent contact with parents could provide education about toothbrushing from an early age and appropriate choices of fluoride toothpaste. With appropriate training other health care professionals could also aide in screening children for early signs of caries (Yumiko et al., 2011) as seen by the 'Lift the Lip' training for Well Child / Tamariki Ora Providers as a simple tool for screening infants and preschool children for caries (New Zealand Dental Association, 2008).

5.4.4 Links between education and oral health status

Poor oral health can lead to missed education opportunities and low academic success, which may result in adverse social and economic effects (Bessa Rebelo et al., 2019). Research also shows there is evidence of an association between teenage pregnancy and educational underachievement (Pio & Graham, 2018). However, the TPU provides an opportunity for pregnant and parenting adolescents to complete their secondary school and access health and social services. The TPU may be well positioned to target oral health education to first time mothers during pregnancy which has been shown to be effective in lowering rates of ECC (Plutzer & Spencer, 2008). It has been reported health promoting interventions may be better received by first time mothers than mothers in general (Plutzer & Spencer, 2008).

As parenting adolescents there may be implications for the oral health of the participants children too. Studies have shown increased caries in children where the parents had lower education levels (Chia et al., 2015; Health Promotion Agency, 2015). The level of education of the parents, the family's socioeconomic situation, and the level of information the mother has about oral health were identified as three significant risk factors for poor oral health status in the literature (Health Promotion Agency, 2015).

This is consistent with the findings of Rothnie et al. (2012) whose study of Dunedin expectant women demonstrated poorer child oral health knowledge in mothers who were younger, first-time mothers, from low socioeconomic status groups or were not NZ Europeans. Schools therefore could be appropriate sites for the provision of oral health education (FDI World Dental Federation, 2014; Moynihan et al., 2018) although this would require changes in NZ curriculum to include oral health.

Chapter 6 Recommendations and Limitations

This final chapter presents recommendations and limitations of the case study. There appears to be little research into the oral health attitudes and practices of adolescent mothers in NZ. Although this study focused on the attitudes and practices of adolescent mothers, the study contributes to the existing knowledge of oral health care by adolescent groups by providing findings for discussing factors influencing oral health outcomes. While prenatal oral health care was not the purpose of this study, further research should grow the evidence base in a NZ context, reported to be lacking (Claas et al., 2011). Furthermore, the findings in this case support previous researchers' recommendations for further research into the motivators and barriers to achieving good oral health for pre-school children. The recommendations are divided into two broad areas, contemporary research and those supporting healthy public policy. Limitations of the case study are explained, then a conclusion presented to highlight the importance of the role of education in improving oral health literacy.

6.1 Recommendations for Contemporary Research

More broadly, due to the lack of currency of quantitative data, contemporary research is recommended to examine if the statistics presented on dental attendance or oral hygiene practices remain consistent, given it has been almost thirteen years since the NZ oral health survey was conducted by the MOH (Ministry of Health, 2010). Social determinants of health are moderated by ever changing environmental, economic, political, and other factors impacting on housing, food, education, and income, which in turn affect health and well-being. Therefore, to explore lived experiences, contemporary qualitative data is also recommended. The findings of the case study indicate similarities to existing research related to access and utilisation. Undertaking further qualitative research to explore the oral health attitudes and practices of adolescents across a wider demographic is recommended. Qualitative research into utilisation of oral health care could contribute to knowledge about issues related to access, failed appointments, and inform policy.

Despite the Ministry of Health's plan to work with DHB's, oral health providers and intersectoral advisory groups during reorientation of the COHS (Ministry of Health,

2006b), there appears to be no research involving adolescents themselves in the development of a service delivery model to improve their engagement. Findings in this case study supported a lack of knowledge by participants about oral health and nutrition therefore further research focussed on oral health literacy is recommended. Research could explore what is known by adolescents about nutrition specific to oral health and factors affecting food choices in this particular age group. Further research could be undertaken to broaden the knowledge base about the role of health promotion and education and to explore better collaboration between health care and education providers in the delivery of oral health education. In addition, where oral health promotion interventions are undertaken, further research is recommended to assess the efficacy of improving knowledge, attitudes, and practices of adolescents.

6.2 Recommendations Supporting Healthy Public Policy

Several findings of this case study are consistent with recommendations made by other researchers in the field of healthy public policy. A further recommendation would be to develop or update existing policy supporting healthy choices across a range of risk factors for oral diseases.

Therefore, the recommendations are:

Dental service delivery:

- Co-design with adolescents to improve access and appeal of oral health clinics
- Improve guidelines on enrolment into COHS
- Revised guidance for CDA contractors on processes for missed appointments and recall appointments
- Extended age eligibility criteria under the CDA
- Broaden scope for dental and oral health therapists to provide restorative treatment to treat over eighteen-year-olds

Oral hygiene practices:

- Promotion of fluoridated water and toothpaste
- Improved guidelines on the recommendations for brushing

- Updated guidelines for the use of fluoride toothpaste at differing levels of fluoride content to avoid confusion for consumers

Implementing fiscal policies to promote healthy diets:

- Consideration be given to a tax or pricing policy on sugar sweetened beverages
- Tax exemptions for healthy foods

Maternal oral health policy and education:

- Specific NZ policy developed for maternal oral health in line with international guidelines
- Targeted oral health education for maternal oral health benefitting mother and child

Review of dental curriculum for oral health professionals to include:

- Oral health education and nutrition
- Role of prevention and patient centred care
- Maternal oral health
- Pre- and post-natal oral health including early childhood

6.3 Limitations of the Study

The small sample of participants may provide a restricted view of the oral health attitudes and practices of adolescent mothers. The limited sample of participants may make it difficult to compare the findings to other child / adolescent data sets, for example the differences in the accounts of dental extractions. A further limitation of the study was the questionnaire data was self-reported so there was potential for participants to report what they thought the researcher; a registered oral health practitioner, might want to hear, rather than being an entirely accurate representation. Notwithstanding these limitations, the participants appeared to have given frank and candid responses during the semi-structured interviews. Future research could include participant dental examinations or an evaluation of patient records.

Despite its limitations, the study adds to our understanding of the unique challenges faced by adolescent mothers to access oral health services. While a case study

methodology may limit the generalizability of the findings, this approach was chosen to produce rich, in-depth contextual data. It was not the intention of the case study to represent all parenting /pregnant adolescents, yet despite its exploratory nature, this study does offer some insight into adolescent attitudes and practices. Nor was it the purpose of this qualitative study to produce generalisable findings to a wider adolescent population. However, demographic data captured along with findings presented may be used to provide an insight into the oral health attitudes and practices of adolescents more generally. Readers of this case study may be able to draw comparisons with their own experiences with adolescents to support engagement, utilisation, and improved oral health outcomes.

6.4 Conclusion

The purpose of the case study was to explore the oral health attitudes and practices of adolescent mothers. Findings from the case study suggest pregnant and parenting adolescents have similar oral health attitudes and practices to other adolescent groups. Attitudes and practices were informed by a range of factors including the participants' experiences of oral health care, any barriers they faced to accessing care and their knowledge about oral health. Parenting adolescents share some of the same barriers and enablers as other adolescent groups in accessing and utilizing oral health services compounded by the added complexities of parenting. Commonly these were a lack of time, the availability of appointments or opening hours of clinics, and transport. In addition, there were childcare considerations in meeting appointments. Consistent with other adolescent studies, this case showed cost was a barrier to oral health services despite access to publicly funded care. This study strengthens the need to undertake a review of community oral health services, including a review of the age limit for publicly funded oral health care.

The case study highlights the importance of the role of education to improve the oral health literacy of participants. Knowledge about oral health was associated with informal means, including advertising and family as well as formal education from teachers and health professionals. Few participants in this case study were able to make the connection between oral and systemic health or well-being. Instead, the cosmetic role of teeth appeared as a factor as was consistent with other research findings. While

participants knew they needed to brush their teeth and some knew to eat healthily for good oral health, the case study highlighted a general lack of knowledge about the role of sugar in caries initiation and progression. Generalized nutrition education was received, though the primary educators were teachers, nutritionists, and other health practitioners and not the oral health practitioner. The findings support research suggesting schools like Mount Eden TPU are a place where oral health professionals could either provide education or be a part of the planning and implementation of health promoting activities. Renewed research in this field is recommended, as many studies being published are reporting secondary analysis of aging data sets. This could shed light on current attitudes and practices as well as barriers to accessing oral health care by adolescent groups. Improvements in oral health promoting policy, service delivery, oral health literacy as well as attitudes and practices could result in a reduction in oral diseases in children and adolescents in the future and support improved oral health outcomes. Overall, this could see improved quality of life and a reduction in the burden of oral diseases for generations to come.

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Appendices

Appendix A *Ethics Approval*

Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

27 May 2019

Patricia Lucas
Faculty of Health and Environmental Sciences

Dear Patricia

Re Ethics Application: **19/177 Exploring the oral health outcomes for secondary school mothers: a case study.**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 27 May 2022.

Non-Standard Conditions of Approval

1. 1. In the Information Sheet, please make it clear that the interviews will happen at school during normal school hours.

Non-standard conditions must be completed before commencing your study. Non-standard conditions do not need to be submitted to or reviewed by AUTEC before commencing your study.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using form EA2, which is available online through http://www.aut.ac.nz/research/researchethics.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using form EA3, which is available online through http://www.aut.ac.nz/research/researchethics.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form: http://www.aut.ac.nz/research/researchethics.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.

Please quote the application number and title on all future correspondence related to this project.

AUTEC grants ethical approval only. If you require management approval for access for your research from another institution or organisation then you are responsible for obtaining it. You are reminded that it is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.

For any enquiries, please contact ethics@aut.ac.nz

Yours sincerely,

Kate O'Connor
Executive Manager
Auckland University of Technology Ethics Committee

Cc: tanya.cleland@aut.ac.nz; Carolyn Cairncross

Appendix B *Written assent – Eden campus TPU Head teacher*

Eden Campus and Early Learning Centre

Tanya Cleland
AUT

5th April 2019

To whom it may concern,

The students of Eden Campus are happy to work with Tanya Cleland in the research for her Masters thesis in relation to oral health and nutrition in adolescents.

Regards

Karen Donnelly
Head Teacher
Eden Campus School for Young Parents

Street Address: 16 Ngauruhoe Street, Mt Eden, Auckland 1024. Postal Address: PO Box 67148 Mt Eden, Auckland 1349.
ph 09 638 3412, **email** kdonnelly@aggs.school.nz

Appendix C *Participant information sheet*

Participant Information Sheet

Date Information Sheet Produced:

02 May 2019

Project Title

Exploring the Oral health outcomes for Adolescent mothers: A case study

An Invitation

My name is Tanya Cleland and I am a lecturer in Oral Health at AUT University. Some of you may have met me when I have visited with Oral Health students for our Oral Health Promotion activities.

This is an invitation to participate in research which will contribute to my own study goal (to obtain a Master of Health Sciences). The aim of the research is to explore the oral health attitudes and practices of adolescent mothers. In addition, to try and find out what things impact on your oral health and to help inform people about what you need and try to get changes made.

What is the purpose of this research?

The purpose is to find out what you know and do about your own and your child(ren's) oral health.

I hope the things you tell me will help me understand your oral health practices so we can work toward improving oral health services and education for your age group and your children.

Your confidentiality and privacy is very important to me. Some of the things you tell me may be used as part of my own studies (thesis for Masters), for teaching or presented at Oral Health conferences and in publications (journals). I would also like to see it used to support better services for young people. You will not be identified in any of these uses.

How was I identified and why am I being invited to participate in this research?

As the AUT Oral Health Department already has a relationship with your school through our Oral Health Promotion programme, the school was approached to see if it was willing to participate.

All currently enrolled students who are sixteen years or older will be invited to participate. Your participation is **entirely voluntary**. Each student will receive this information sheet and a consent form. You are not obliged to participate.

How do I agree to participate in this research?

If after reading this information sheet and asking any questions you decide to participate in the research, you will be asked to complete a written consent form.

Your participation in this research is voluntary (it is your choice) and whether you choose to participate (or not) will neither advantage nor disadvantage you. You can withdraw from the research at any time. If you choose to withdraw from the research, then you will be offered the choice between having any

data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

If you agree (consent) to help you will be asked to fill in a written questionnaire. This contains basic information about you, your own oral health and experiences. This information will be collected and used as part of the research. After that students will be asked to participate in a short interview. The interviews will happen at your school, during normal school hours. You can be open and honest about your experiences as it will just be you and me. No-one will know who you are in the research as it will be confidential, and no names are used. If there are questions you do not want to answer, then you do not have to. The information collected will not be used for any other use than described here – research, my teaching and studies, conferences and publication (i.e. journal articles) and to help make services you have access to better.

What are the discomforts and risks?

There are no tests or examinations. You will be free to answer questions as you wish. We will do this in a relaxed interview style. There are no right or wrong answers. Your confidentiality is very important. As you are a small group of students some people might be able to guess what you said but we will do everything we can to avoid this.

What are the benefits?

The research will help me gain a qualification (Master's in Health Science). I would like to see the research also help to improve oral health outcomes for adolescents and improve the types of oral health education and services available for your age group.

How will my privacy be protected?

If you consent to take part in the study all information collected will be dealt with sensitively and discreetly. The interview will be digitally recorded to make it easier for me to remember our conversation. Any recordings are for transcription purposes (written down so I do not forget) and will not be shared. Any transcribers or recorders will be asked to sign a confidentiality agreement about this.

What are the costs of participating in this research?

There are no monetary costs. All the research can be carried out at school. We will need some of your time to complete the initial written questionnaire and carry out a short interview (approximately 30 minutes).

Will I receive feedback on the results of this research?

Yes, if you wish to receive feedback on the study findings this information will be made available to you.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Patricia Lucas, PhD, patricia.lucas@aut.ac.nz. Phone (09) 921 9999 ext 7134.

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Kate O'Connor, ethics@aut.ac.nz , 921 9999 ext 6038.

Whom do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

Researcher Contact Details:

Tanya Cleland –

Email: tanya.cleland@aut.ac.nz

Phone: (09) 921 9999 ext 6878

Project Supervisor Contact Details:

Patricia Lucas, PhD, patricia.lucas@aut.ac.nz. Phone (09) 921 9999 ext 7134.

Carolyn Cairncross, PhD, carolyn.cairncross@aut.ac.nz. Phone (09) 921 9999 ext 7609

Approved by the Auckland University of Technology Ethics Committee on *27 May 2019*, AUTEC Reference number *19/177*

Appendix D *AUTEC approved consent form*

Consent Form

Project title: ***Exploring the Oral Health outcomes for adolescent mothers: A case study***

Project Supervisors: ***Patricia Lucas and Carolyn Cairncross***

Researcher: ***Tanya Cleland***

- ○ I have read and understood the information provided about this research project in the Information Sheet dated 2 May 2019.
- ○ I have had an opportunity to ask questions and to have them answered.
- ○ I understand that notes will be taken during the interviews and that they will also be recorded and transcribed (my words will be put into writing).
- ○ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ○ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ○ I agree to take part in this research.
- ○ I wish to receive a summary of the research findings (please tick one): Yes○ No○

Participant's signature: .....

Participant's name: .....

Participant's Contact Details (if appropriate):

.....

.....

.....

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on 27 May 2019 AUTEC Reference number 19/177

Appendix E *Written questionnaire*

Auckland University of Technology
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ORAL HEALTH SURVEY

Section A – Demographic Information

Your age: (circle one):	16 years	17 years	18 years	19 years or over

Ethnicity: (please tick any that apply)

New Zealand European		Maori	
Samoan		Cook Island Maori	
Tongan		Niuean	
Chinese		Indian	
Other (please specify):		Prefer not to say	

How many children do you have? (circle one):	Currently pregnant	One child	Two children	Three or more children

What are their ages?
Child 1:
Child 2:
Child 3:

Section B – Oral Health Information

1. How would you describe the health of your teeth and mouth? (circle one):

Excellent	Good	Average	Poor	Unsure

2. If you compared the health of your teeth and mouth to others your age would you think it was: (circle one)

Better than most	About average	Below average	Worse than most

3. In the past 12 months how many times have you visited a Dental / Oral Health therapist / Hygienist or Dentist? (circle one answer):

None	Once	Twice	More than twice

4. What was the reason for your visit to the dental clinic? (circle one)

Routine examination (check-up)	Pain / problem / other treatment	I did not visit

5. Have you ever missed a dental appointment? If yes, what was the **MAIN** reason? (circle one):

Cost	Fear	Lack of time	Availability of appointments	Access / transport

Other (please explain):

6. When you go to the dental clinic do you pay? (circle one):

Yes	No	For some treatment	I don't know

7. Have any of your children been to a dental clinic? (circle one) Yes / No

Who did they see? (circle one):	Dentist	Oral Health or Dental Therapist	I'm not sure

8. How important do you think healthy baby teeth are?

Very important	Important	Not important	I don't really know

Please complete the rest of the questions on the back of this page.

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Section C – Oral Health Risk and protective factors			
1. How often do you brush your teeth? (circle one)			
Once a day	Twice a day	Not every day	When I remember
Other (please explain):			
2. How often do you brush your child/children's teeth? (circle one)			
Once a day	Twice a day	Not every day	When I remember
Other (please explain):			
3. Do you use toothpaste yourself? (circle one)			
Yes	No	Sometimes	
What kind of toothpaste? (please explain):			
4. Do you use toothpaste for your child(ren)? (circle one)		Not applicable	
Yes	No	Sometimes	
What kind of toothpaste? (please explain):			
5. What age do you plan to help your child(ren) with their brushing until before they do it themselves?			
Write the age here:	If you don't know circle: I don't know		
6. Do you use dental floss?			
Yes	No	Sometimes	
7. How often do you smoke cigarettes / tobacco? (circle one)			
I don't smoke	At least once a week	At least once a day	
More than once a day	Social smoker	Trying to quit smoking	
8. Do you think your diet is important for your oral health? (circle one)			
Yes	No	Maybe / I don't know	
Briefly explain your answer:			
9. Do you think the health of your mouth and teeth is linked to your general health and well-being? (circle one)			
Yes	No	I don't know	
Give a reason for your answer?			

Appendix F *Indicative interview questions*

Semi Structured interview indicative questions

	Question guide		Notes
1	What does 'Oral Health' mean to you?		
2	Tell me about your oral health...		
3	Tell me about your past dental experiences (previous treatment, dental pain, management).		
4	What do you think are the barriers or challenges faced by you for in accessing current oral health services?		
5	How can we improve services to encourage more families to access dental health services?		
6	Do you think that Oral Health services available are meeting the needs of New Zealand people?	If not, why? What services are available? To who?	
7	What oral health practices do you get your children to do?	What about yourself? Discuss tooth brushing, frequency, fluoride.	
8	In the survey question about nutrition, 'X' was identified as playing a role in oral health.	What is your understanding of 'X's' role?	
9	What would be useful for you to help you and your child eat better?		
10	Research tells us that Oral diseases (i.e. tooth decay, gum problems) share the same common risk factors as many other chronic diseases.	What do you think some of those risk factors might be? Why? (Discuss diet, alcohol, injuries, SES, tobacco, Hygiene, stress, other)?	
11	What advice have you been given about oral health?	From who? i.e. oral health practitioner, nutritionist, school, plunket/ Midwife other?	
12	What advice have you been given about nutrition?	From who? i.e. oral health practitioner, nutritionist, school, plunket/ Midwife other?	
13	What questions do you have about healthy eating and / or your oral health?		

Appendix G *Mind map of thematic analysis coding*