He mahi rangahau hauora Māori

A Māori health research project

Oranga niho me ngā tangata whaiora

Oral health and Māori mental health patients

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Contents

1. EXECUTIVE SUMARY

Across all age groups, Māori do not enjoy the same oral health status as the majority New Zealand European population. The New Zealand adult oral health survey (2010) stated:

"Māori experienced disparities in oral health across a range of indicators, from oral health outcomes to access to services." *Our Oral Health: 2009 New Zealand Oral Health Survey, Ministry of Health 2010*

Tangata whaiora (or Māori mental health patients) have significant unmet dental treatment needs. This situation was observed and recognised by the oral health clinicians in this study, each of whom has had extensive clinical experience over the last three decades.

This study, in the main, was a qualitative research project in which the thoughts, experiences, attitudes and behaviours of a sample of Māori mental health patients were elicited, both before and after receiving a complete course of dental care.

Forty-one tangata whaiora based within Tauranga Moana (The Western Bay of Plenty) were recruited as participants. They underwent a mental health interview (The Health of the Nations Outcome Scale, or HoNOS mental health interview tool) by a Māori psychiatrist, followed by a dental health interview employing the Oral Health Impact Profile short form - (OHIP-14) by Māori oral health professionals. They then underwent a course of oral rehabilitation. After the completion of their dental treatment, they were re-interviewed to ascertain the impact on their health and wellbeing of having a restored dentition. However, 13 participants withdrew from the study at different times for a variety of reasons, resulting in only 28 of the patients completing dental treatment and 17 completing all post dental treatment interviews.

The findings indicated that, prior to treatment, all participants reported episodes of dental problems such as pain and toothache, infection and bad breath. Some participants had suffered from toothache for considerable periods of time before seeking dental care, if at all. All participants reported seeking only emergency dental care as an adult. All had unmet dental treatment needs such as dental caries, failed restorations, retained roots, periodontal disease, edentulous spaces or edentulousness with no dentures. Most participants reported that their oral health did impact upon their tinana, hinengaro, whānau and wairua in various ways and to various extents.

After oral rehabilitation, most participants reported a positive improvement in their psycho-social well-being, oral function, self-esteem, relationships and dynamics within their immediate social environment. There was a major improvement in the oral–health-related quality of life of the participants, as indicated by the pre- and post- Oral Health Impact Profile data. A number of participants stated that they would in future take a more responsible approach to their own oral health care and to that of their whānau as well.

<u>Outcome Measures</u>

Prior to dental treatment, the Oral Health Impact Profile short form (OHIP-14) interview revealed that 72% of the sample had one or more impacts in any of the 7 OHIP-14 domains (functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap). This is more than three times the 23% prevalence reported for Māori using the same measure in the 2009 National Oral Health Survey.

After completion of dental treatment, there was a large decrease in the overall mean OHIP-14 score, representing a considerable improvement in oral-health-related quality of life among the participants for whom follow-up data were available: the mean OHIP-14 score fell from 22.6 to 9.5, representing a substantial improvement with a statistically large effect size.

The Health of the Nations Outcome Scale (HoNOS) was administered both before and after dental treatment; it revealed that the majority of the tangata whaiora showed a distinct positive improvement in their psycho-social functioning. However, the domains involved differed among the various participants, because there were different mental health diagnoses within this small sample of tangata whaiora.

District Health Boards (DHB) provide hospital-based dental services for medically compromised or disabled people who are unable to access conventional care through community-based dentists due to the nature of their conditions. Emergency dental care for eligible low-income adults is also available from DHBs. Some DHBs also provide basic dental care for eligible low-income adults. All low-income adults with an urgent oral health problem and who cannot afford to see their dentist can contact their DHB through hospital dental outpatient services to find out what is offered. Low income adults can also apply to Work and Income New Zealand (WINZ) for discretionary financial assistance for urgent dental treatment. There is no requirement for people to be an existing beneficiary to apply for this. Despite the availability of these services, many tangata whaiora in this study did not access them or did so only for pain relief. It is possible to argue that, when tangata whaiora enter mental health services for the first time, they should (on admission) have an oral health screening incorporated into their initial history and examination process. The current practice in mental health settings is that all patients, including tangata whaiora, are screened for physical health problems. A dental health screening could also be a part of this physical health screen. A dental health screen would ask the patient about their self-perceived oral health. If a dental health issue was identified, then a referral could be made to an appropriate clinical dental service. If this was able to be achieved, there would be subsequent changes in their health and well-being (as defined by Te Whare Tapa Wha) with consequent improvements in their daily functioning as individuals. This may lead to positive changes in their management as mental health patients which could include an acceptance of their individual treatment plan, returning for follow-up appointments, and being less likely to discontinue treatment. There would also be positive changes in their relationships within their immediate social environment and to their approach to life in general.

Limitations of the research

The findings for Māori may not be generalizable beyond the Western Bay of Plenty region (Tauranga Moana) given the small number of participants, differences in DHB Māori populations, and the differing service delivery models used by other DHBs.

This was challenging research, particularly around maintaining contact with the tangata whaiora, which resulted in a low participation rate, and changes to how the questionnaires were administered (face to face and then telephone; extended timeframes to collect the data). The small sample size was determined because the study was to provide an insight into the oral health needs of tangata whaiora from which a more comprehensive study could be developed. With regard to this, the study outcome does provide some valuable insight into the oral health and treatment needs of tangata whaiora.

The strengths of the research are the great lengths the research team went to uphold the mana of the tangata whaiora, and the collaboration between the researchers, the Bay of Plenty-based Māori mental and oral health teams and Te Manu Toroa, the Māori oral health provider and the University of Otago.

2. THE RESEARCH PARTNERSHIP

This kaupapa Māori oral health research project was funded by a Health Research Council of New Zealand and Ministry of Health Research Partnership. The research was conducted as a partnership between the University of Otago in Dunedin and Te Manu Toroa, a kaupapa Māori health service based in Tauranga Moana.

The research team members

University of Otago	Professor John Broughton	Principal Investigator
	Dr Vivienne Anderson	Qualitative Researcher
BOPDHB	Dr Mark Lawrence	Psychiatrist
Te Manu Toroa	Mr Martin Steinman	NMO Business Development Manager
	Ms Jackie Nichol	Administration Support Dental
	Mrs Sue Wright	Home-based Support Worker
	Dr Rudi Johnson	Dental Surgeon
	Dr Matt Johnson	Dental Surgeon
	Mrs Minnie McGibbon	Dental Team leader
	Mrs Barbara Laing	Dental Team
	Mr Phil Hikairo	Dental Manager

Te Manu Toroa is a Māori health provider in Tauranga Moana which offers Kaupapa Māori Health Care Services in the Western Bay of Plenty. The Mission Statement & Principles of Te Manu Toroa are:

- To provide comprehensive, integrated community and Primary Health Care for Maori in the Western Bay of Plenty; and
- To improve the life of our people through using the concept of Tangata Whenua determinants of health.

The foundations upon which this will be achieved are our fundamental principles and core values, which are based on a belief that:

- The Treaty of Waitangi recognises and guarantees Tino Rangatiratanga over the material, cultural and spiritual resources of Tangata Whenua which must be endorsed and promoted;
- The relationship between Te Manu Toroa and Te Whanau Poutirirangiora a Papa will remain intact;
- The Tino Rangatiratanga of each Whānau, Hapū and Iwi will be respected; and
- Whakapapa, Whanaungatanga and Aroha shall be paramount.

Te Manu Toroa has a kaupapa Māori dental service which provides dental care under the Combined Dental Agreement

The Faculty of Dentistry of the University of Otago has had an ongoing working relationship with Te Manu Toroa through the final year dental student community placement programme, in which Te Manu Toroa hosts students during the 5-week placement.

The relationship between Te Manu Toroa and the University of Otago was formalised in the joint signing of a Memorandum of Agreement in 2011. Clause 4.3 of the document states that, among other things, "Both parties will…Provide opportunities for research with Te Manu Toroa when agreed…" There was therefore a very strong basis on which to engage in a research project.

The agreed project was:

Oranga niho me ngā tangata whaiora
The oral health of Māori mental health patients

The design of this research project required the establishment of two teams working in partnership at a local level:

1. The Māori dental health team
   Te Manu Toroa would provide this team from within their own staff.
   The dentist was the BOPDHB Principal Dental Officer.

2. The Māori Mental Health Team
   This necessitated the involvement of Mental Health & Addiction Service, Community Mental Health of the BOPDHB with the psychiatrist as a co-researcher.

One participant in this research project said:

Wow, a Māori psychiatrist and now a Māori dentist; tumeke!
I've never ever seen that before.

3. BACKGROUND

3.1 Māori oral health

Māori do not enjoy the same level of oral health as non-Māori across all age groups. The Dunedin Multi-Disciplinary Health and Development Study has convincingly demonstrated that poor oral health status in infancy and childhood is a precursor to poor oral health in later life (Thomson et al, 2004). The oral health project at Ratana Pa (Broughton, 1995) showed that poor oral health was a barrier to employment, while good oral health eliminated a reason to smoke; people with severe periodontal disease and associated halitosis used cigarettes to temporarily disguise bad breath. The Ratana Pa study also found that poor oral health impacted upon hinengaro, self-esteem and quality of life. Maintaining good oral health throughout life can minimise both onset and severity of other health states and hence is an important factor in maintaining overall health and well-being.

The oral health status for Māori adults was revealed in the 2009 New Zealand Oral Health Survey (Ministry of Health 2010), which stated:

"Tooth loss and untreated dental decay continued to feature prominently in oral health outcomes for Māori adults in 2009, with Māori adults being almost twice as likely to be edentulous as non-Māori adults. In addition, dentate Māori were significantly less likely than non-Māori to have a functional dentition, and have teeth missing due to pathology. In terms of dental caries they had, on average, nearly twice as many teeth with untreated coronal decay, fewer filled teeth and a significantly higher lifetime dental decay experience (DMFT). Māori adults also had a significantly higher prevalence of untreated root decay than non-Māori adults. Dentate Māori had significantly higher prevalence of periodontal pocketing and loss of attachment at the three depths reported."

The 2009 NZ Oral Health Survey (Ministry of Health, 2010) confirmed similar findings from previous national oral health surveys, which showed that Māori adults had poorer oral health than non-Māori adults (Cutress et al, 1976; Hunter et al, 1992). It also noted that clinically measured poor oral health was mirrored in the self-report and quality of life findings for Māori adults:

"Māori adults were significantly more likely than non-Māori adults to rate their oral health as fair or poor and to have had one or more oral health impacts that affected their quality of life."

It was therefore not unreasonable to presume that the oral health of tangata whaiora could be wanting in respect of their unmet dental treatment needs, mirroring the conditions reported in the New Zealand Oral Health Survey. Anecdotal evidence certainly provides such a picture. The Principal Investigator of this project has facilitated a Māori oral health service based at the Faculty of Dentistry in Dunedin for almost 25 years. In that time, he has noted that many tangata whaiora dental patients had high dental treatment needs on their first presentation, due in part to dental neglect which was often through no fault of their own.

With regard to access to dental services, the *New Zealand Oral Health Survey* report noted that:

"…there were significant access issues identified in the 2009 survey for Māori with cost being an important barrier to access. Māori adults had a significantly higher perceived need for dental treatment, and in the previous year were more likely to have avoided dental care due to cost and to have gone without recommended routine dental treatment due to cost.

They were also significantly less likely to have visited a dentist in the past year and were less likely to visit regularly for check-ups."

There are many barriers to accessing dental health services in New Zealand. Basic dental care is free for all New Zealanders up to their 18th birthday, through the school dental service as pre-schoolers, infants, primary and intermediate school children. During their teenage years, rangatahi aged 12/13 to 17 years may access dental care through the Adolescent Oral Health Scheme. After 18 years of age, dental care in New Zealand is user-pays, and has become prohibitive for many adults because of the cost. Some funding is available through WINZ for emergency care, which is rigorously defined as 'control of pain and infection'. Some other WINZ funding may also be available for those entitled to this support, but knowledge of (and access to) this resource is not always available, and there are administrative procedures which may seem to be formidable barriers to people who are not used to asserting themselves in such situations. The development of Māori oral health providers has attempted to provide an accessible and affordable oral health service for the communities they serve.

Māori oral health gained prominence in the Māori health sector in the 1990s. The Report to the National Health Committee on preventive dental strategies for older populations (Thomson ed. 1997) noted that "the burden of dental diseases can have considerable social impact on their day-to-day lives. Such impacts can range from impairment (anatomical loss or abnormality), pain and discomfort, through to disability (limitation in performing the activities of daily life) and even handicap."

This apt description could be justifiably applied directly to the Māori population. In 1998, the then Board of the Health Funding Authority identified eight priority areas for Māori health gain, one of which was oral health (HFA 1998). One strategy that was introduced was emergency care for low income adults, but both the eligible client group and the service provided was limited. The Ministry of Health report, Well-being of Whānau (Ministry of Health 1998), noted that "Māori have relatively poor oral health compared to non-Māori." The National Advisory Committee on Core Health and Disability Services (1992) had recommended that "emphasis should be placed on ensuring fairness of access to core services." Dental Services were listed as a core health and disability support service.

In 1999, the New Zealand Dental Association (NZDA 1999) developed oral health goals for the new millennium, and those stated that "fundamental to the approach taken are the principles of Te Tiriti O Waitangi as central to both Māori health development and a healthier New Zealand." The document outlined specific oral health goals and targets for Māori throughout life. Target 2.3.8 was "to promote and support the development of appropriate oral health services to meet the dental health needs of Māori." While the previous decade has seen the growth of iwi-based oral health services, their contracts often do not extend to providing an affordable service for tangata whaiora. One of the most significant developments to progress Māori oral health was the establishment of Te Ao Mārama, the New Zealand Māori Dental Association in 1996 whose kaupapa was "hei oranga niho mō te iwi Māori." This national Māori health organisation is now the recognised voice for oranga niho, with significant input into the development of appropriate policy for Māori oral health advancement.

The Ministry of Health document, *Good Oral Health for All for Life, The Strategic Vision for Oral Health for New Zealand (2006)* recognised that improving the oral health of Māori "is a particular priority in realising the oral health vision." This vision also noted that "DHBs will also be required to demonstrate the steps their own services are taking to ensure services meet the needs of the Māori population." The research outcomes of the current project

suggest that there may be a role for dental care in the management of tangata whaiora in the community, but that further work in larger samples is needed to confirm the effect.

It is against this background that this Māori oral health research project was conducted. In essence, many tangata whaiora have very high dental treatment needs which have come about for a variety of reasons. This prospective intervention study is intended to demonstrate and examine the impact of oranga niho on their quality of life. The study will ascertain the improvement on overall health and well-being, including mental health, as an outcome of having a fully restored dentition.

3.2 Hauora hinengaro, Māori mental health.

The 1998 Māori Health Commission report *Tihei Mauri Ora*! stated that "there is a crisis in Māori Mental Health of unprecedented proportions". Dr Mason Durie noted that "mental health problems are now the number one health concern for all Māori."

As far back as 1984, the Māori Women's Welfare League report *Rapuora* found that 4.8% of Māori women in their study reported suffering from depression for a period of at least 6 months. One of the conclusions of the Health Funding Authority document *Eight Health Gain Priority Areas for Māori Health 1999/2000* was that, "in order for mental health gain to be achieved by Māori, a range of strategies and services are required." This theme was supported by the Mental Health Commission's *Blueprint for Mental Health Services in New Zealand* (1998), which stated that "improving mental health services alone will not solve all mental health problems; the very best outcomes can only be achieved by all sectors making a commitment to contribute to the mental health needs of New Zealanders." One part of the overall health sector is the oral health sector, which has the potential to make an important contribution to a mental health/dental health nexus. The current study is focused upon tangata whaiora and oral health, with intended outcomes that could act as a stimulus for enhanced strategies and services to meet their oral health needs. This, in turn, may have positive impacts upon mental health and well-being.

This notion comes through Dr Joanne Baxter's report, *Māori Mental Health Needs Profile Summary, A Review of the Evidence* (Ministry of Health, 2008), which states: "The adjusted figures highlight that societal inequalities in socioeconomic positions are contributing to Māori mental health needs. This provides powerful evidence for the need to support broader policies that aim to reduce societal inequalities for Māori in social and economic and educational outcomes. It is clear that these broader inequalities impact on Māori mental health." The report also states: "Initiatives to reduce inequalities in terms of educational outcomes for Māori and reduce physical health inequalities between Māori and non-Māori will bring benefits to reducing inequalities for mental health problems." Of course, one of the most apparent of the physical health inequalities between Māori and non-Māori pertains to oral health.

At the whānau level of Māori society, Durie states: "the capacity to care (manaakitanga) is a critical role for whānau. Unless able to provide a measure of care for those who cannot fend for themselves, a whānau cannot be said to meet fundamental levels of protection and nurture. Given the diminishing commitment by the state to provide for families 'from cradle to the grave', pressures on whānau to care for their own will become increasingly evident. At the same time, while compassion and a protective instinct will favour an attitude of caring, economic realities may superimpose practical obstacles that will prevent adequate levels of care, no matter how well-intentioned the whānau." In this particular context, manaakitanga can include the care, and protection of the mouths of whānau members. "Fundamental levels of protection and nurture" can include each whānau member having their own toothbrush.

The vision statement of the Ministry of Health document *"Rising to the Challenge" The Mental Health and Addiction Service Development Plan 2012-2017* states: "Whatever our age, gender or culture, when we need support to improve our mental health and wellbeing or address addiction, we will be able to rapidly access the interventions we need from a range of effective, well integrated services." The maintenance of oral health should then be one of the interventions that are part of the "range of effective, well integrated services." The vision statement concludes with, "We will have confidence that our publicly funded health and social services are working together to make the best use of public funds and to support the best possible outcomes for those who are most vulnerable."

It is appropriate, then, that some emphasis be placed on ensuring that oral health services be readily accessible for tangata whaiora to achieve and maintain their oral health, rather than just respond to recurrent painful episodes of toothache or infection.

Whilst it is recognised that there was a small sample group of participants in this study, it is reasonable to suggest that tangata whaiora entering community-based mental health services for the first time should on admission have an oral health screening incorporated into their initial history and examination. The nature of this screening would involve questions pertaining to the tangata whaiora's self-perceived status of the own oral health. This notion is not new and has been reported in the international literature. Kiseley et al (2011), in their study of people with severe mental illness and dental disease in the United States, concluded that psychiatric patients have not shared in the improving oral health of the general population; consequently, their management should include oral health assessment using standard checklists completed by non-dental personnel. Interventions should include oral hygiene care. Nalliah et al (2013) recommended that mental health patients in the United States have preventive health programmes designed to improve patient education. This would in turn reduce the number of ED visits made by this population and would impact positively upon the hospital sector. In the UK, Patel et al (2012) made the point that, because of the poor oral health of mental health patients, an "upstream" approach to the management of these issues could include oral health promotion to improve oral care, diet, reduce smoking and increase dental attendance.

Rising to the Challenge, The Mental Health and Addiction Service Development Plan 2012-2017 states that desired goals and actions include "enhanced integration, improved mental health and wellbeing, physical health and social inclusion; and disparities in health outcomes addressed." Addressing the oral health of tangata whaiora as an integral part of mental health management will, in turn, contribute to improved overall health. If a dental treatment need was identified then a referral can be made to an appropriate dental health service and encouragement made for the tangata whaiora to access dental health services as required. Improved oral health will have a significant ripple effect, as there are some indications that poor oral health has an association with systemic diseases such as coronary heart disease, stroke and respiratory disease. Poor oral health also impacts upon speech, eating and self-esteem.

Rising to the Challenge also notes that "hapū, iwi and the Māori community have an important role in shaping the way in which communities and services respond to people experiencing mental health or addiction issues and in supporting recovery for Māori who use services." An important approach in this regard is to ensure that there is an appropriate linkage between mental health services and dental health services. Māori oral health services are very much community-based, and where they are established in communities are therefore well placed to provide an appropriate service to meet the dental treatment needs of tangata whaiora.

3.3 Māori mental health and oral health.

In his PhD thesis (Oranga niho: a review of Māori oral health services, 2006), Broughton commented that, "a relationship between mental health and oral health was evident in the comments from Māori mental health workers that I had the fortune to interact with during the course of my work. One mental health worker who was seeking oral health care for tangata whaiora (Māori mental health patients) in her care said:

> *In my experience, when one of our tangata whaiora gets a toothache, well everything goes out the window. They go off their medication. They go right off everything. The only dental services in our area are in private practice and our people can't afford that. For our people in this situation, well it becomes so difficult to manage.*

Another Māori mental health worker related how:

> *One of our tangata whaiora got such a bad toothache that he just took off and ended up going down the street and bopping somebody. The police were called in and he ended up being arrested. And all this happened because we couldn't get proper dental care.*

One Māori mental health worker who brought a tangata whaiora to Te Whare Kaitiaki, the Whānau Dental Clinic at the University of Otago Dental School, commented:

> *This is just a part of your healing. We will get your teeth fixed up so that your whole tinana is right. Hinengaro and tinana go hand-in-hand. Holistic health…it's what we do.*

In a community-based assessment of the oral health needs of Māori mothers in Porirua, Makowharemahihi (2006) reported that: first, mothers had significant oral health needs; second, that information, support and access to dental care was deficient; third, that the dental system for adults was ineffective for Māori mothers; and fourth, an oral health system for low-income groups based largely on emergency treatment provided little opportunity for preventive dental care. She concluded that "there is a need for a community-based oral health service that incorporates a whānau approach and focuses on preventive care." Again, it is not unreasonable to assume that tangata whaiora would also mirror this lack of access to oral health care services, in common with a number of other disadvantaged subgroups within New Zealand.

Te taha hinengaro is the mental and emotional dimension of a person. Māori people believe that the mind cannot be separated from either the body or the soul. Māori theory has always been that general health was strongly affected by mental activities (Durie, 1985). Self-esteem is a part of mental health and well-being, and poor oral health can have a serious impact on both. At the oral health project at Rātana Pā (Broughton 1995a), the impact of poor oral health on self-esteem was very evident. A number of young Māori mothers with poor oral health tended to hide their teeth when speaking, especially to strangers. After one such patient had all her upper anterior teeth restored, her five year-old son came running out to the Māori health community worker saying, " Hey Aunty, come and look at mum! She's smiling, she's laughing! She's got nice new shiny white teeth!" The Māori health community worker commented that the effect on the self-esteem of this young mother was considerable. It was the first time that this child had seen his mother smile for such a long time. The grandparent, commenting on the response of her daughter following dental treatment said, "She just can't believe the difference. She's a whole new person" (Broughton 1995b).

For tangata whaiora, the association between te taha hinengaro and oranga niho is just as relevant as it is for everyone else. There is considerable anecdotal evidence that many Māori mental health patients have poor oral health. A contributing factor to this may be that, because many tangata whaiora are community-based, they may have difficulty accessing an affordable oral health service. Oral health services for adults (with some specific exceptions) operate on a user-pays principle. As a result, many tangata whaiora have neglected dentitions, which can have serious consequences that may impact adversely upon themselves, their whānau and their community.

Kisley et al (2011) reported that "people with severe mental illness are susceptible to oral disease for a number of reasons: these include amotivation, poor oral hygiene, fear, specific dental phobia, dental costs, difficulty in accessing health care facilities and the side-effects of psychiatric drugs (such as dry mouth, or xerostomia). In the United States, Nalliah at al (2013) reported that, in 2008, people with mental health conditions made a total of 63,164 visits to hospital-based EDs for a dental problem which incurred substantial hospital charges. In the UK, Patel et al (2012) reported that oral health has a great impact on patients with severe mental illness being treated in a community setting and their oral health is poorer than the national adult general population. He reported that the population with severe mental illness have unhealthier lifestyle and dental factors such as smoking, more caries, a greater number of missing teeth and sporadic and symptom-driven dental attendance.

3.3 Rangahau Kaupapa Māori/Māori Research

Rangahau kaupapa Māori, or Māori research, is understood to mean research that is conducted within a Māori cultural context. This has very wide connotations for research. Linda Smith (1998) noted that "a research methodology is a theory and analysis of how research does or should proceed." When this notion is applied to the concept of "*kaupapa Māori* research", it is understood to mean a research method that is conducted from a Māori perspective, taking into account Māori beliefs, attitudes, values and cultural constructs. While there has been considerable debate among Māori at *hui* and in the literature (Durie, 1998; Health Research Council, 2003) as to the definition of *kaupapa Māori* research, most would support the notion that *kaupapa Māori* research is "research that is conducted by Māori for Māori about Māori". *Kaupapa Māori* research offers a theoretical framework to conduct research that is relevant, meaningful, appropriate and acceptable to Māori. The findings or outcomes of that research have reliability, validity, relevance, meaning, appropriateness and acceptability to Māori and, most importantly, are beneficial for Māori. This particular study was, right from the outset, a *kaupapa Māori* research project. One of the most powerful aspects *of tikanga Māori* (Māori cultural practices) is *kōrero* or stories, which stem from *Te Ao Tawhito* (the old world of the Māori). Pre-European Māori society was an oral society with histories, legends, mythology, cosmology, and beliefs retained and passed down through oral traditions. Hence, in conducting this particular research study, the ngākau or heart of the research process was to listen to the participants and to gather their stories about their own experiences of oranga niho.

4. RELEVANCE OF THE RESEARCH

This project is very significant for two particular reasons: first, it addresses Māori with disabilities (i.e. tangata whaiora or Māori mental health patients); and second, this group will include “low income adults, kaumātua and Māori people with special needs or chronic health conditions” (Robson et al., 2011). The project is being conducted in partnership with the Māori health organisation Te Manu Toroa, which engages with whānau, hapū and iwi within the rohe of Tauranga Moana (The Western Bay of Plenty) and the Bay Of Plenty District Health Board Mental Health and Addiction Services.

This project also complies very well with the research agenda “toward the right to good oral health”, as articulated in the recent document, *Oranga Waha (Robson et al*, 2011*)*. First, whānau hapū and iwi community development is a basic principle of the research partner, Te Manu Toroa. Their Mission Statement and Principles are "to provide comprehensive, integrated community and Primary Health Care for Maori in the Western Bay of Plenty," and "to improve the life of our people through using the concept of Tangata Whenua determinants of health.” The foundations upon which this will be achieved are their Fundamental Principles and Core Values, based on the Treaty of Waitangi, “which recognises and guarantees that Tino Rangatiratanga over the material, cultural and spiritual resources of Tangata Whenua must be endorsed and promoted.” Second, the entire Tauranga Moana-based research team are Māori and adhere very strongly to their individual whānau, hapū and iwi identity, and collectively to the basic principal of whakawhanaungatanga in this mahi (work). Third, Te Manu Toroa has been responsible for an important oral health service for at least 15 years; this project is an opportunity to develop their services by adding value and increasing their capability. Fourth, this project is being conducted at the local level in Tauranga Moana in a partnership between an oral health service (Te Manu Toroa Kaupapa Māori Dental service), a Māori mental health service (Mental Health & Addiction Service, Community Mental Health, BOPDHB) and the University of Otago (Faculty of Dentistry and The Department of Preventive and Social Medicine, Dunedin School of Medicine.

5. RESEARCH DESIGN AND METHODOLOGY

5.1 Research personnel

This research project was conducted as a working partnership between two teams:

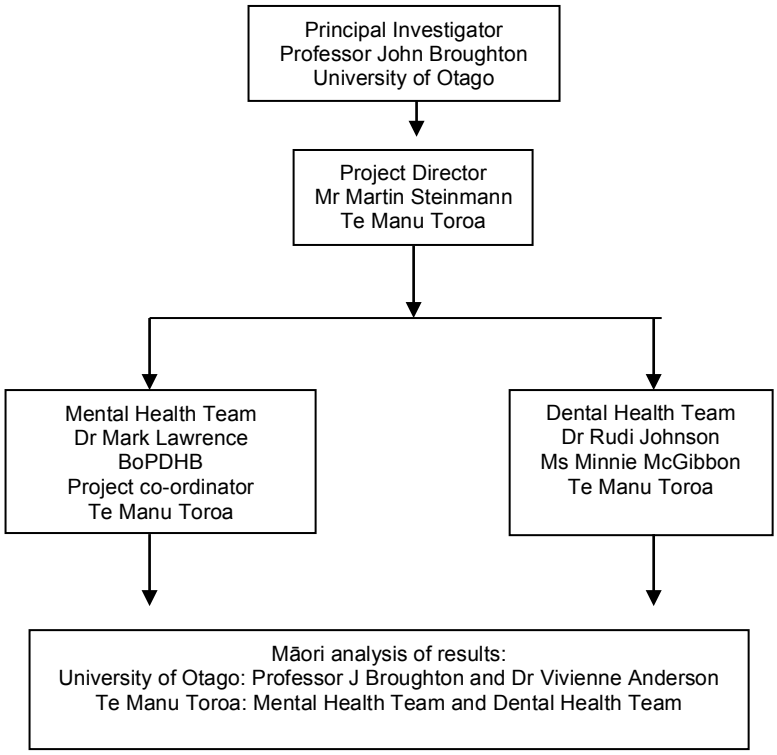
The Mental Health Team, led by Dr Mark Lawrence; and

The Dental Health Team, led by Dr Rudi Johnson with Minnie McGibbon and Barbara Laing.

In support of these two teams was an **administrative team** led by Mr Martin Steinmann of Te Manu Toroa, with Ms Sue Wright and Ms Jackie Nichols.

Overseeing these groups was the **Principal Investigator**, Professor John Broughton of the **University of Otago**. **Dr Vivienne Anderson** from the University of Otago assisted with analysis of the qualitative interview transcripts *(Figure 1)*. **Professor W Murray Thomson** kindly undertook the statistical analysis of the Oral Health Impact Profile short form (OHIP-14) data.

Figure 1. Research organisation



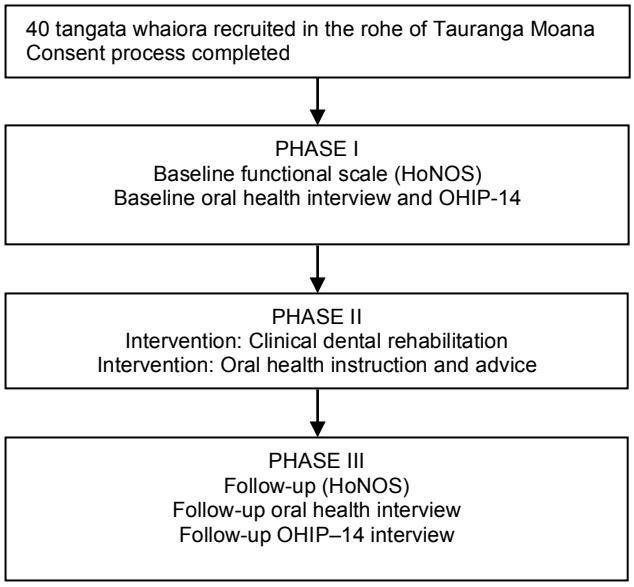
5.2 Research Aims

1. To investigate the impact of oranga niho on the quality of life of tangata whaiora;
2. To restore the dentitions of a cohort of tangata whaiora and assess the impact on their self-reported oral health;
3. To utilise a kaupapa Māori methodology based upon tikanga Māori and te kawa o te marae.
4. To provide the opportunity for a Māori health provider, Te Manu Toroa, to actively engage in and own a kaupapa Māori health research project;
5. To demonstrate the principle of whakawhanaungatanga through the working partnership between The University of Otago, Te Manu Toroa, Bay of Plenty District Health Board Mental Community Mental Health and Bay of Plenty DHB Dental Health Service.

5.3 Study design

This was a prospective study design employing two intervention activities, with all participants receiving the intervention (Figure 2).

Figure 2. Study design schema



The intervention comprised two components: (1) clinical dental care to rehabilitate the dentition and oral health of the participants, which may include restorative dentistry (fillings), minor oral surgery (extractions), periodontal dentistry endodontic dentistry and prosthetic dentistry; and (2) oral health instruction and advice.

5.4 Research design

As described above, all participants received the intervention. On recruitment, each tangata whaiora underwent a mental health interview and the first of two dental health interviews.

1. **The mental health interview tool** used was the Health of the Nations Scale Outcome Scale (HoNOS). It had been originally intended to use the GHQ-12 mental health tool, but as a copyrighted measure, a license to use the GHQ-12 for funded academic research cost 200 Euro per interview. As this cost was not budgeted for, the HoNOS was used instead (see 5.8.2).

2. **The first dental health interviews** involved: (1) a qualitative engagement to capture the oral health histories, experiences, beliefs, attitudes and behaviours of the participants in their own words; and (2) the short form Oral Health Impact Profile (OHIP-14; Slade, 1997).

On completion of a full clinical dental rehabilitation, the research participants underwent the following:

1. **The second mental health interview**, a repeat administration of the HoNOS.
2. **The second dental health interviews**, which were (1) a follow-up qualitative questionnaire, and (2) a repeat administration of the short form Oral Health Impact Profile (OHIP-14; Slade, 1997);

5.5 Participants and sample size

The research participants were tangata whaiora who were long term clients of Māori mental health services in Tauranga Moana. Initially, it was intended to have 30 tangata whaiora complete all three phases of this project. However, because the team anticipated the likelihood of some participants withdrawing once recruited (or withdrawing during their dental treatment), 40 tangata whaiora were recruited to compensate for any attrition during the course of this project. Tangata whaiora could exit the project at any point for any reason (which they did not have to justify).

5.6 Recruitment

Recruitment was through Community Mental Health Bay of Plenty District Health Board Needs Assessment and Co-ordination Service and Te Puna Hauora Ki Uta Ki Tai. The inclusion criteria were as follows:

- Identity as Māori;
- Adult tangata whaiora between the ages of 18-65;
- A DSM IV-R diagnosis of mental illness;
- Currently stable in community setting;
- Capacity to consent to the proposed dental procedures;
- Currently receiving mental health input from community mental health (DHB) and/or NGO mental health provider (Te Manu Toroa and Te Puna Hauora ki uta ki tai);
- Stable accommodation and support, to ensure follow-up;
- No acute risk of deliberate self-harm and/or suicide or violence;
- Stable mental health act patients were also considered;

Exclusion criteria were:

- Acute Hospitalisation (current inpatients);
- Acute symptoms affecting capacity to consent;
- Acute risk to self or others;
- Unstable tangata whaiora being treated under the Mental Health Act (1992);
- Any active addiction which may exacerbate psychiatric symptoms;
- Any significant general medical condition that would compromise dental treatment.

The psychiatrist who was responsible for the Māori Mental Health Team undertook the recruitment of the participants. A participant administration record was initiated, and a psychiatric assessment was undertaken. The psychiatrist then undertook the first HoNOS interview. The participant administration record was then passed to the project operational coordinator who then engaged with the Māori Dental Health Team.

On receipt of the participant administration record, an appointment was made to enrol the participant with the oral health provider for his/her dental care. No clinical dental treatment occurred at this appointment because it was deemed necessary for the participant to become acquainted with the dental surgery environment in a non-threatening or intimidating way. At this appointment, the first qualitative oral health interview was undertaken and a dental treatment appointment was made.

5.7 Sample size

Our sample size was based on a guide provided by Sandelowski (1995). This was to allow the researchers to tap into a range of people with different mental health disorders, different ages and genders. However, it was intended to over-sample with a cohort of 40 participants, because it was anticipated that there would be the potential for attrition due to participants becoming unwell, moving away from the area or wishing to withdraw for their own personal reasons.

There were 41 Māori mental health patients who were initially recruited into this study; one participant withdrew almost immediately. The gender mix was 40% males and 60% females with an age range from 21 to 61 years of age.

5.8 Phase I

5.8.1 The entry point interviews

The questionnaires were conducted by the two teams, as each team had their respective emphasis. Three instruments were to be used: 1) the mental health interview was the Health of the Nations Outcome Scale (HoNOS) undertaken by the Mental Health psychiatrist; 2) the dental health interview developed by the Māori dental health team and based on Te Whare Tapa Whā, the model of Māori health and well-being; and 3) the short form Oral Health Impact profile (OHIP-14). The dental health questionnaires were administered by the Dental Health Team (the dentist and the dental therapist/clinical administrator).

5.8.2 Mental health interview

The Health of the Nations Outcomes Scale (HoNOS) is the first standard measures of assessment and recovery mandated by the Ministry of Health for collecting mental health outcome information in New Zealand. The HoNOS (adult) is designed for adult service users between the age 18 and 65 years. It is a clinical outcome measure used to measure the health status of service users who use mental health services (Tauranga Hospital, 2011). The HoNOS is used routinely at Tauranga Hospital where the participants in this study were recruited through outpatient mental health services. It is used as a tool to note changes between admission and discharge, which contribute to determining the improvements made by clients during an inpatient stay. The changes in HoNOS scores are categorized as either: (1) a significant improvement; (2) a significant deterioration; or (3) no significant change. The HoNOS tool is an appropriate tool for use in this study to ascertain any significant improvement in the participants' mental health and wellbeing following a complete oral health rehabilitation.

The HoNOS is used by mental health services, which support recovery, and in monitoring changes in people's health, wellbeing and circumstances over time. Measuring outcomes for people using mental health and addiction services supports the best possible service delivery and understanding of how well services are doing. The HoNOS focuses on functional outcomes, with 12 major domains which can measure change over time following a clinical intervention. It is an acceptable and useful clinician-rated tool with satisfactory inter-rater reliability.

The HoNOS was administered prior to the dental intervention as part of the initial psychiatric assessment and again after the completion of dental treatment as the main functional outcome measure. The HoNOS (Adult) Scales 1 to 12 are:

1. Overactive, aggressive, disruptive or agitated behavior
2. Non-accidental self-injury
3. Problem drinking or drug-taking
4. Cognitive problems
5. Physical illness or disability problems
6. Problems associated with hallucinations and delusions
7. Problems with depressed mood
8. Other mental and behavioural problems
9. Problems with relationships
10. Problems with activities of daily living
11. Problems with living conditions
12. Problems with occupations and activities

Each item is rated on a 5-point item of severity (0 to 4) as follows:

0 No problem
1 Minor problem requiring no formal action
2 Mild problem
3 Problem of moderate severity
4 Severe to very severe problem
9 Not known or not applicable

This questionnaire was administered by the project's Mental Health Team Leader, the psychiatrist who was responsible for the undertaking both the pre-dental treatment and post-dental treatment interviews face-to-face. This measure was administered at the end of the initial psychiatric assessment when all inclusion and exclusion criteria had been satisfied.

The psychiatrist administering the HoNOS had received MHSMART training in competently administering the scale. The HoNOS was then repeated after the final dental treatment.

The full HoNOS questionnaire is presented in the Appendix.

5.8.3 Dental health interviews

Two separate dental health interviews were conducted:

(i) The Dental Health Interview

This interview tool was developed by the Māori Dental Health Team because there was no specific kaupapa Māori questionnaire for oranga niho. It was a structured questionnaire of 19 questions that explored the participants' previous access to dental services, their dental experiences, their perceptions of dental health as it related to Te Whare Tapa Whā model of health and well-being, oral health behaviours, and oral health beliefs and attitudes. The structured questionnaire was designed to elicit open-ended responses by the interviewees. The oral health questionnaire is in the Appendix, along with the qualitative data generated.

(ii) The Oral Health Impact profile (OHIP-14)

The short-form Oral Health Impact Profile (OHIP-14; Slade, 1997) was used to collect information on respondents' oral-health-related quality of life (OHRQoL). It comprises 14 items, two for each of seven domains (functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap). Responses were coded as 'Very often' (scoring 4), 'Fairly often' (3), 'Occasionally' (2), 'Hardly ever' (1) or 'Never' (0). OHIP-14 scores were computed in two ways. First, an overall OHIP-14 score was calculated by summing responses over all 14 items. The total OHIP-14 score is a measure of the 'severity' of adverse impacts caused by oral conditions, and uses all response categories. Second, the prevalence of impacts was computed (at subscale and whole-scale level) by identifying individuals who experienced impacts 'Very often' or 'Fairly often'; this is reported as the proportion of the sample experiencing one or more OHIP-14 impacts.

For each of the OHIP-14 items, participants were asked how often in the past 12 months they had experienced the problem; the reference periods were identical in the two study questionnaires.

The oral health interview consisted of 18 in-depth questions, while the OHIP-14 comprised a further 14 questions. The two dental interviews were not undertaken at the same time because it was realised during interviewer training that this would be too onerous for the participants. In order to uphold the mana of the participant and to avoid the risk of the participant becoming whakamā, the two interviews were undertaken on separate occasions.

5.9 Phase II Intervention

Phase II was in two parts:

(a) the clinical dental intervention; and
(b) oral health instruction and advice.

5.9.1 Phase II (a): Clinical dental intervention

This included a full clinical dental examination, radiographs, and prophylaxis. The examining dental professional followed a standardised protocol to record levels of tooth loss and caries experience. A treatment plan was then developed for each tangata whaiora and discussed with them and their whānau, if desired. To render the tangata whaiora dentally healthy involved restorative dentistry (fillings), minor oral surgery (extractions), periodontal treatment, endodontic treatment and prosthetic dentistry. The dental treatment was conducted by the registered Māori dentist assigned to this project at the Te Manu Toroa Kaupapa Māori Dental Service, based at Papamoa. All prosthetic dentistry was undertaken by another dentist contracted to undertake this treatment.

5.9.2 Phase II (b): Oral health instruction and advice

Participants received culturally-appropriate kōrero regarding their oral health. This involved the use of Māori-specific oral health promotion resources for three critical aspects of oral health: diet, healthy oral behaviours and oral health protection (including exposure to fluoride). The emphasis of the interventions was on oral health for life, taking a life course approach based on whānau ora.

Interventions were designed to suit each individual tangata whaiora and included the themes listed below.

1. Oral health knowledge: prevention of dental diseases; foods and beverages harmful for oral tissues; behaviours harmful for oral tissues, and the oral health and general health relationship.
2. Oral self-care: ways to look after the teeth, including tooth brushing, dental floss, inter-dental brushing and care of dentures.
3. Oral health protection and fluoridation as a part of Te Whare Tapa Whā model of health and well-being: Tinana (physical), Hinengaro (mental), Whānau (family), and Wairua (spiritual) dimensions.

Each session was held kanohi-ki-te-kanohi (face-to-face), with open two-way kōrero (dialogue) between the oral health professional and the tangata whaiora (who was accompanied by other whānau at their discretion). A range of communication styles was used, including giving meaningful examples and demonstrating procedures. Each participant received oral health-related items consistent with the intervention themes. The total package consisted of Māori-specific oral health promotion dialogue on basic oral hygiene and oral health aids (toothbrushes, fluoride toothpaste). These sessions took place during dental treatment by the dentist, who was assisted by the dental therapist.

5.10 Phase III Follow-up

On completion of their dental treatment, the participants were followed up to undertake the second oral health interview. They were then referred back to the Māori Mental Health Team to undertake the second post-dental treatment HoNOS interview. Following this interview the participants were contacted again to undertake the second post-dental treatment (OHIP-14) dental interview.

The Follow-Up Dental Health Interview was developed by the Māori Dental Health Team and was again based upon Te Whare Tapa Whā model of health and well-being. There were just

6 questions. This questionnaire and the qualitative data generated are presented in the Appendix.
All interviews were conducted kanohi-ki-te-kanohi. The interviews were not recorded, the participants' responses being noted by hand on paper.

5.11 Analysis of quantitative and qualitative data

Analyses were undertaken using SPSS version 20. For the descriptive analysis of the baseline data, descriptive statistics were computed and then bivariate analyses used Chi-square tests and analysis of variance to determine the statistical significance of differences in proportions and means, respectively.

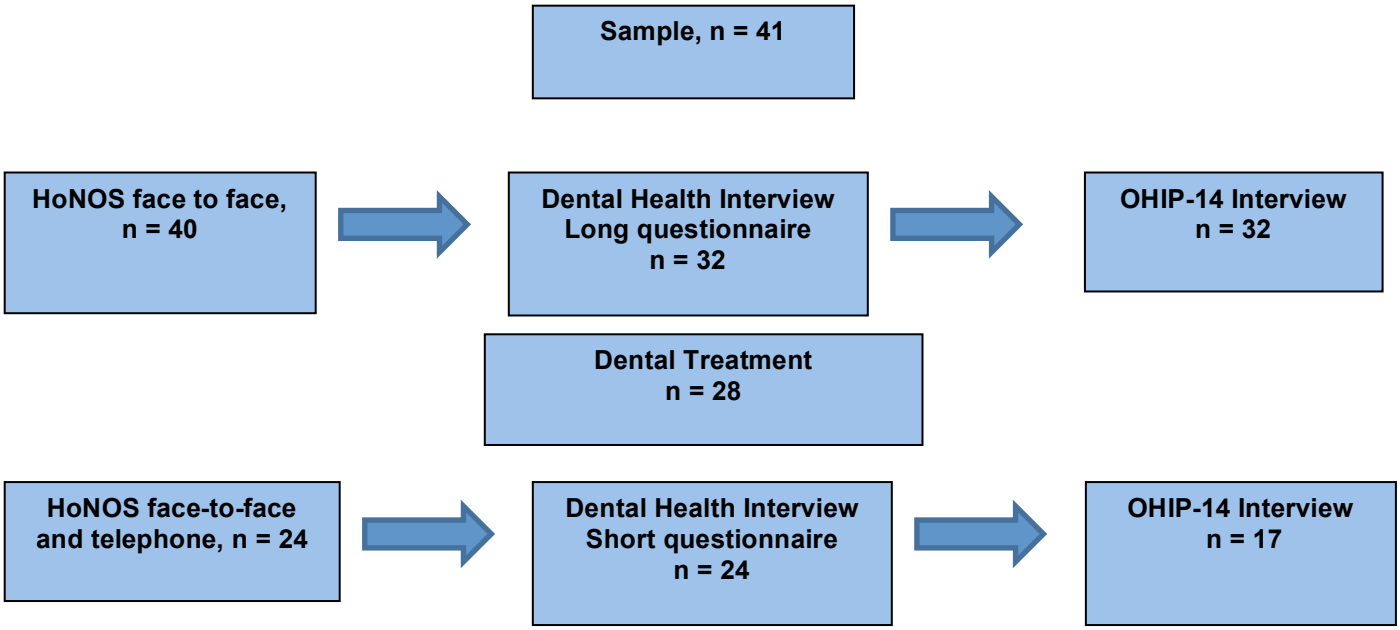
Changes in mean scores over time were examined using paired t-tests. Effect sizes were calculated by dividing the change in score by the standard deviation of the baseline score. Effect sizes were then categorised according to the following standard schema: effect sizes of less than 0.2 indicate a small clinically meaningful magnitude of change, 0.2 to 0.7 a moderate change, and greater than 0.7 a large change. Changes in impact prevalence over time were tested for statistical significance using McNemar tests.

On completion of the first and second Dental Health interviews, the qualitative data were transcribed from the individual interview sheet to a master sheet. From this master sheet, the themes and issues elicited could be readily identified and grouped accordingly.

5.12 Ethics Committee approval

Ethics Committee approval was obtained from the Northern Y Ethics Committee based in Hamilton.

5.13 Summary of recruitment process



6. Results

6.1 Timing of interviews and treatment

The timings of the interviews and dental treatment are presented in Table 1.

TABLE 1: Timings of the interviews and dental treatment

PRE-DENTAL TREATMENT	
Recruitment of participants commenced Recruitment of participants completed	18 July 2012 6 March 2013
Pre-dental treatment HoNOS interview commenced: Pre-dental treatment HoNOS interview completed:	18 July 2012 6 March 2013
Pre-dental treatment Oral Health interview commenced: Pre-dental treatment Oral Health interview completed:	22 July 2012 24 Jan 2013
Pre-dental treatment OHIP-14 interview commenced: Pre-dental treatment OHIP-14 interview completed:	28 Sept 2012 12 April 2013
DENTAL TREATMENT	
Dental treatment commenced: Dental treatment completed:	28 Sept 2012 12 April 2013
POST-DENTAL TREATMENT INTERVIEWS	
Post-dental treatment HoNOS interview commenced: Post-dental treatment HoNOS interview completed:	4 October 2012 11 April 2013
Post-dental treatment Oral Health interview commenced: Post-dental treatment Oral Health interview completed:	03 April 2013 14 April 2013
Post-dental treatment OHIP-14 interview commenced: Post-dental treatment OHIP-14 interview completed:	28 July 2013 19 Nov 2013

The times taken for the follow-up post-dental treatment interviews ranged from one week to several months. This was due (in the main) to the increasing difficulty experienced by the field research staff in maintaining contact with the participants, many of whom appeared to have a transient life-style, changing addresses several times during the study.

Of the 41 initial participants, 17 withdrew during the course of the study for a variety of reasons.. A total of 40 participants undertook the first mental health interview; 32 participants undertook the first dental health interviews; 28 participants completed their dental treatment; 28 participants completed the second dental health qualitative interview; 24 participants completed the second mental health interview, but only 17 participants completed the second Oral Health Impact profile (OHIP-14).

All 32 participants who undertook the first dental health interview reported accessing dental care as a primary school pupil under the School Dental Service; three-quarters of them could recall learning about the benefits of oral health from the dental therapist. However, only half of the sample reported that they continued with dental care as an adolescent while at high school, and only 2 participants reported having any regular dental care as an adult.

A total of 21 participants reported that they had sought dental care as an adult because they had a particular dental problem such as pain, toothache, a broken tooth, wisdom teeth problems, periodontal problems or a recognised need for an extraction or filling. Half of the participants who reported having suffered from toothache did seek dental care, but the other half did not, either putting up with the pain, taking analgesics or extracting the tooth themselves. When asked whether everyone in their immediate household had a toothbrush, 94% reported that they did. However, only two-thirds of the sample reported that they brushed their teeth at least once a day, while the remainder brushed "hardly ever" or just once a week.

Three-quarters of the sample had heard of fluoride and that it "made the teeth stronger". One-quarter had no knowledge of fluoride at all, and just 1 participant expressed opposition to water fluoridation.

When asked about how they would deal with a carious anterior tooth, most reported that they would opt for a restoration (rather than an extraction). For the situation of a carious posterior tooth, just half the sample would opt for a restoration.

6.2 Psychiatric diagnoses

Table 2 shows the psychiatric diagnoses among the 41 in the recruited sample. The majority of the psychiatric illnesses suffered by the participants were either a depressive disorder or bipolar disorder. Psychosis (schizophrenia/drug-induced psychosis) accounted for 26% of the sample, with schizophrenia being the most frequent diagnosis. Anxiety disorders, Substance dependence/abuse disorders (mainly cannabis abuse) and "Other" diagnosis (mainly Adjustment disorder) made up the remainder of the diagnoses. In terms of secondary diagnoses or co-morbidity disorders, 76% of cases had more than one diagnosis, suggesting that comorbidity was common.

TABLE 2: Psychiatric diagnoses in the sample

Psychiatric Diagnosis	**No (%) - N=41**
Depressive disorder/Bipolar disorder	16 (39)
Psychosis: Schizophrenia/Drug-induced psychosis)	11 (26)
Anxiety disorders including Post-Traumatic Stress Disorder (PTSD)	7 (17)
Substance dependence/abuse disorders	3 (7)
"Other": Adjustment disorder being the most common.	4 (10)

6.3 First mental health interview

The outcome measure used in this sample was a pre-dental and post-dental treatment Health of the Nation Outcome Scale (HoNOS). There is no established norm in the literature for significant functional change *per se* for the HoNOS. The research team identified appropriate criteria of significance based on a previous clinical project audit at Tauranga Hospital (Internal Report 2011) after reviewing inpatient HoNOS scores pre- and post-discharge from a mental health hospital setting. The HoNOS score can change either up or down or remain the same.

A HoNOS score that increased was considered to be a negative outcome, reflecting worsening mental health. Thus, in this study, an increased HoNOS score signified that the dental intervention was associated with poorer functioning in the 12 HoNOS domains after dental treatment. A zero change in functional score on the HoNOS suggested that the dental intervention was not associated with any functional change. A HoNOS score that decreased indicated a positive change in functioning after the dental intervention.

The cut-offs presented in Table 3 were consistent with those elucidated in a previous clinical audit (conducted in 2011) of an inpatient sample at the Bay of Plenty District Health Board. Since that clinical audit focused purely on an inpatient sample and the sample in the current study was mostly community-based, with lower levels of acute symptoms, it was appropriate to accept a 5-point change as the minimally important difference, rather than the 6-point change used in the inpatient clinical audit.

TABLE 3: Interpreting change in the HoNOS score

1-2 point change	mild improvement
3-4 point change	moderate improvement
>5 point change	significant improvement

Table 4 gives an overview of the participants' first and second HoNOS scores and (where appropriate) the reason why the follow-up (post-dental treatment [tx]) HoNOS was not completed.

The HoNOS score is best interpreted when comparing different scores within the same individual rather than comparing different individuals who have different baseline scores. A total of 40 participants completed the pre-dental HoNOS as part of their comprehensive psychiatric assessment, with an average score of 10.3. A total of 24 participants completed the post-dental HoNOS, with an average score of 2.7 after the dental intervention.

TABLE 4: HoNOS scores Pre-dental treatment and Post-dental treatment

Participants	Pre-dental tx HoNOS	Post-dental tx HoNOS
1	15	Lost to follow-up
2	8	2
3	10	Withdrew consent
4	4	3
5	7	1
6	12	Lost to follow-up
7	3	0
8	5	Withdrew consent
9	10	3
10	16	4
11	14	5
12	6	Unable to contact
13	13	Unable to contact
14	8	5
15	9	6
16	7	2
17	20	2
18	10	3
19	16	Unable to contact
20	16	6
21	13	Moved
22	10	Moved
23	3	2
24	10	3
25	1	Withdrew consent
26	10	2
27	6	2
28	3	3
29	7	0
30	2	2
31	6	Moved
32	27	Withdrew consent
33	10	0
34	17	Withdrew consent
35	9	Unable to contact
36	10	4
37	9	2
38	8	1
39	21	Unable to contact
40	12	Unable to contact

6.4 First dental health interviews

There were 32 participants who undertook the first dental health interviews. The findings for each question are presented below. Additional qualitative data are presented in the Appendix.

Q1. *Do you remember going to the School Dental Clinic when you were a child at primary school?*

All participants reported having accessed dental care as a child with the school dental service.

Q2. *Did the School Dental Therapist/Nurse teach you about looking after your teeth?*

A total of 24 participants (75%) recalled learning about aspects of oral health from the school dental therapist.

Q3. *Do you remember going to the dentist when you were at high school?*

A total of 16 participants (50%) reported that they accessed dental care as an adolescent which would have been with either the Dental Benefit Scheme of the Adolescent Oral Health Scheme.

Q4. *After you left high school did you continue to have dental care as an adult?*

All but two of the participants reported that they had not had any regular dental care as an adult after leaving school.

Q5. *If you did have regular dental care can you tell me about that?*

One participant had dental care when he was a member of the NZ Army Regular Force. This ceased after leaving the Service. Another participant reported they had "a dental visit every 12 months and got maintenance work done."

The results of utilisation dental care services are presented in Table 5.

TABLE 5: Utilization of dental services

Dental Service	**No (%) - N=32**
Dental care as a child with the School Dental Service	32 (100)
Dental care as an adolescent with Adolescent Oral Health Scheme	16 (50)
Regular dental care as an adult	2 (6)

Q6. *If you did not have regular care as an adult, have you ever needed to go and see a dentist?*

A total of 21 participants reported that they had sought dental care as an adult. The reasons for seeking dental care are presented in Table 6.

TABLE 6: Reasons for seeking dental care

Reason for seeking dental care	N (%) - N=21
Pain/toothache	7 (33)
Wisdom teeth	6 (29)
For an extraction	4 (19)
Broken tooth	1 (5)
Periodontal problem	1 (5)
Emergency	1 (5)
For a filling	1 (5)

6.5 Self-reported dental problem

Q7. *Have you ever had toothache, or any other dental problems?*

Of the 31 participants who responded to this question, 28 (90%) reported that they had experienced toothache or another dental problem as an adult. Five participants reported that they had suffered with pain and toothache for periods of time before accessing any dental care. One participant said that they "had had pain now for 3 weeks." Three participants reported that they were currently suffering from untreated dental pain.

Q8. *What did you do to get things (your dental problem) fixed up for you?*

The 29 participants who responded to this question reported the action taken (or otherwise) in overcoming their toothache. Half had sought dental care from a dentist to treat their toothache, but one-quarter did nothing. One participant stated that, "*I must've gotten used to the pain."* The reported actions are presented in Table 7.

Table 7: Personal actions as a consequence of suffering from toothache

Response to suffering toothache	N (%) - N=29
Went to a dentist	15 (52)
Did nothing	7 (24)
Just took analgesic or pain killer	5 (17)
Pulled own tooth out	1 (3)
Was just careful how they ate	1 (3)

6.6 Te Whare Tapa Whā

Q9. *Have you heard about Te Whare Tapa Whā, the model of Māori health and well-being?*

Only one-quarter (N=8) of the participants reported that they had heard of Te Whare Tapa Whā, the model of Māori health and well-being. However, the greater majority of the participants were still able to respond to questions in the interview pertaining to oral health and te taha tinana, te taha hinengaro, te taha whānau and te taha wairua.

Q10. *What is the impact (if any) of your own oral health on your tinana?*

There were a variety of responses to this question. The most frequent response was pain, followed by difficulty in eating. The responses are presented in Table 8. The participants could provide more than one response to this question if they wanted to.

TABLE 8: Self-reported impact of oral health on te taha Tinana

Impact of oral health on te taha tinana	**N (%) - N=40** **(Total number of responses)**
Pain	14 (35)
Difficulty eating	9 (26)
Unable to sleep	3 (8)
Headaches	3 (8)
Gets you down or depressed	3 (8)
Makes you feel unwell	2 (4)
No longer socialize with friends/whānau	2 (4)
Become stressed/grumpy	2 (4)
Affects whole body	1 (2)
No longer smile	1 (2)

Q11. *What is the impact (if any) of your own oral health on your hinengaro?*

There were 32 responses to this question. The main impact of their oral health status on their hinengaro was the loss of self-esteem or becoming self-conscious (see Table 9).

TABLE 9: Self-reported impact of oral health on te taha hinengaro.

Impact of oral health on te taha hinengaro	**N (%) - N=31** **(Total number of responses)**
Loss of self-esteem, became self-conscious	9 (28)
Unable to think or concentrate	5 (17)
Feelings of distress	4 (13)
Thoughts of having to do something about the dental problem	4 (13)
No longer smile	4 (13)
Become bad tempered/grumpy	3 (8)
Experience increase in depression	3 (8)

Q12. *What is the impact (if any) of your own oral health on your whānau?*

There were 27 responses to this question. The main reason given by the participants in this study was the whānau support that was provided to them. This may have been encouragement to seek dental care or to provide funds to pay for the cost of dental care. The second reason given was that the participants tended to avoid interactions with other whānau members. However, two participants reported that they no longer had a connection to their whānau. Two participants provided positive oral health messages to their whānau by stating, “It’s a good example to kids on what not to do.” The data are presented in Table 10.

TABLE 10: Self-reported impact of oral health on te taha whānau

Impact of oral health on te taha whānau	**N (%) - N=28** **(Total number of responses)**
Whānau support	14 (50)
Avoid interactions with other whānau members	12 (43)
Positive oral health message to whānau	2 (7)

Q13. *What is the impact (if any) of your own oral health on your wairua?*

There were 20 responses to this question. The main reason, expressed in a variety of ways, was the acknowledgement of "a higher power" in helping them overcome pain and discomfort. The data are presented in Table 11.

TABLE 11: Self-reported impact of oral health on te taha wairua.

Impact of oral health on te taha wairua	**N (%) - N=20** **(Total number of responses)**
Acknowledgement of "higher power"	10 (50)
Try to maintain a balance in life	4 (20)
Whakamā	3 (15)
"My spirit was painful as well as my tooth"	2 (10)
Hard to kōrero with whānau	1 (5)

6.7 Oral health behaviours

Q14. *Does everyone in your household have a toothbrush?*

A total of 30 of the 32 participants reported that everyone in their household had a toothbrush

Q15. *How often do you brush your teeth?*

Two-thirds of the sample reported brushing at least once a day and one-third reported that they brushed "hardly ever" or just once a week. The data from questions 14 and 15 are presented in Table 12.

TABLE 12: Oral self-care behaviour

Oral health behaviour	**No (%) - N=32**
Everyone in their household had a toothbrush	30 (94)
Brush teeth at least once daily	20 (63)
Brush teeth occasionally, hardly ever or once a week	10 (31)

6.8 Oral health beliefs

Q16. *Does what you eat have an effect on the health of your own teeth?*

There were a total of 54 responses to this question (participants were permitted more than one response). Just over half the responses believed that there was a relationship between oral health and diet. Many of the participants said that they were aware of the detrimental effects of sugar in the diet on oral health. The data are presented in Table 13.

TABLE 13 Oral health beliefs and diet

Oral health belief	**N (%) - N=54** **(Total number of responses)**
Yes, diet does has an effect on oral health	28 (52)
Sugar in the diet is detrimental to oral health	16 (30)
Maintenance of a healthy fruit and vegetable diet is good for your teeth	5 (9)
No longer eats “junk food”	4 (7)
Calcium in milk is good for teeth	1 (2)

Q17. *Do you know about the benefits of fluoride for having healthy teeth?*

Some knowledge of the benefits of fluoride was evident, as three-quarters of the participants reported that they had either “heard of it” or knew that it “made the teeth strong”, while one-quarter of the participants reported that they had no knowledge or understanding of fluoride and dental health at all. Knowledge of the specific benefits of fluoridation were scant and comments included, “*It’s supposed to be good for your teeth*.” Only one participant expressed an opposition to water fluoridation. For those participants who were aware of the benefits of fluoridation, a number said that they had gained this information from television advertisements. These results are presented in Table 14:

TABLE 14: Knowledge of fluoride

Knowledge of fluoridation	**No (%) - N=32**
No knowledge at all	8 (25)
Had heard of fluoride	24 (75)

6.9 Oral health attitudes

Q18. *If you had a bad toothache in a back tooth, would you prefer to get it taken out or filled?*

One-third of the sample would opt for the restoration of a posterior tooth.

Q19. *If you had a bad toothache in a front tooth, would you prefer to get it taken out or filled?*

Most participants reported that they would opt for a restoration rather than extraction. The results of questions 17 and 18 are presented in Table 15.

TABLE 15: Preferred treatment option

Treatment option	No (%) - N=32
Would opt for restoration of a carious anterior tooth	26 (81)
Would opt for restoration of a carious posterior tooth	17 (53)

6.10 Oral Health Impact Profile (OHIP-14)

This survey tool was undertaken prior to any dental treatment taking place. There were 32 participants who undertook the first OHIP-14 interview.

OHIP-14 data is presented in Table 16 by sex and prevalence of impacts.

TABLE 16: Prevalence of OHIP-14 impacts by sex

	Male	Female	P value	Total	%
Functional limitation	7 (53.8%)	4 (21.1%)	0.055	11	34.4
Physical pain	7 (53.8%)	11(57.9%)	0.821	18	56.3
Psychological discomfort	9 (69.3%)	12(63.2%)	0.722	21	65.6
Physical disability	4 (30.8%)	8 (42.1%)	0.515	12	37.5
Psychological disability	7 (53.8%)	10 (52.6%)	0.946	17	53.1
Social disability	5 (38.5%)	6 (31.6%)	0.687	11	34.4
Handicap	8 (61.5%)	8 (42.1%)	0.280	16	50.0

There was no significant difference between males and females in the seven domains of the prevalence of OHIP-14 impacts. Whilst the size of the sample group was small (N=32), the prevalence of the impact for some domains does reveal a picture for this group of tangata whaiora: over 50 per cent had endured physical pain; and 50 per cent had reported a handicap because of a problem with their dentition. What is more revealing is that 65 per cent had psychological discomfort; just over 50 per cent had a psychological disability; and one-third had reported a social disability. As this group of tangata whaiora already have a pre-existing mental health illness, the psycho-social impact of a dental problem may well impact upon their mental health and well-being.

The prevalence of individual item impacts is presented in Table 17, by sex.

TABLE 17: Prevalence of individual item impacts (fairly often & very often) by sex

	Male	Female	Total Very often & Fairly often	%
Trouble pronouncing words	6 (46.2%)	0 (0%)	6	18.8
Sense of taste worsened	4 (30.8%)	4 (21.1%)	8	25
Pain in mouth	2 (15.4%)	7 (36.8%)	9	28.2
Uncomfortable eating	6 (46.2%)	11 (57.9%)	17	53.1
Felt self-conscious	9 (69.2%)	11 (57.9%)	20	62.6
Felt tense	7 (53.8%)	11 (57.9%)	18	56.0
Diet unsatisfactory	3 (23.1%)	7 (36.8%)	10	31.3
Meals interrupted	3 (23.1%)	4 (21.1%)	7	21.9
Difficult to relax	3 (23.1%)	7 (36.8%)	10	31.3
Felt embarrassed	7 (53.8%)	9(47.4%)	16	50.0
Irritable with other people	5 (38.5%)	6 (31.6%)	11	34.4
Difficulty doing jobs	2 (15.4%)	2 (10.5%)	4	12.6
Life less satisfying	8 (61.5%)	8 (42.1%)	16	50.0
Unable to function	3 (23.1%)	3 (15.8%)	6	18.8
One or more impacts overall	**10 (76.9%)**	**13 (68.4%)**	**23**	**71.9**

The most notable differences between males and females were that 46% of the men had reported difficulty in pronouncing words while none of the women had complained of this; just over twice as many females had endured pain as males; more females than males had difficulty relaxing because of a dental problem; and a higher proportion of males felt that life was less satisfying.

Overall there were a number of individual impacts that evolved as a result of a dental problem. These items can be regarded as being associated with te taha hinengaro, the mental dimension: almost two-thirds felt self-conscious; just over half felt tense; one-third felt it was difficult to relax; 50% felt embarrassed; one-third became irritable with other people; and 50% felt that life was less satisfying. These individual symptoms can all play upon a person's mind. If the person is already disadvantaged through having a mental illness, then an additional concern (such as that represented by one or more of these items) may subsequently have a detrimental effect upon their health and well-being.

Prior to dental treatment, the Oral Health Impact Profile short form (OHIP-14) interview data revealed that 72% of the sample had one or more impacts in any of the 7 OHIP-14 domains (functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap). This is more than three times the 23% prevalence reported for Māori using the same measure in the 2009 National Oral Health Survey. This suggests that this group of tangata whaiora were suffering from problems with their teeth considerably more than the general Māori population. When this situation is then imposed upon an already existing mental health illness, then the general health and well-being of that individual could be compromised in some way.

6.11 Dental treatment

After completing the first mental health interview and the first two dental health interviews, the participants in this study underwent a dental rehabilitation. The dental treatment was carried out by the Māori dentist in dental surgeries operated by Te Manu Toroa.

Dental clinical treatment was provided at Te Akau Hauora, Hartford Ave, Papamoa, on Fridays, between September 2012 and April 2013. A total of 14 days were utilised for clinics during these months and four of these were half days. Appointments for prosthodontic work for eight participants were provided in addition to these dates. Because of the already heavy professional responsibilities of the dentist, that prosthodontic treatment was contracted out and was completed by mid-May 2013.

The total number of study participants who presented for a dental examination was 32. There were four participants who withdrew after commencing dental treatment and did not carry on with their dental treatment to completion. A total of 28 participants carried on with their dental treatment to completion. This included a number of participants who, after having commenced their dental treatment, had expressed their desire not to continue with it. However, after some counselling and reassurance by kaumātua of Te Manu Toroa, they opted to continue their dental treatment through to completion.

The average age of the dental patients in this study was 38 years. The youngest participant was 21 years and the oldest was 61 years. Since many had multiple pathologies, the medications that had been prescribed for them were for depression, asthma, schizophrenia, hypertension, epilepsy, pain and inflammation (due to headaches or toothache). Participants were asked whether they were regular smokers. There were 14 who identified as smokers, along with one ex-smoker and 13 non-smokers.

At their first clinical appointment, the participants were asked, “When was your last dental visit?” 13 participants were unable to recall when they had last visited a dentist; 15 participants indicated that their last dental visit was anything up to 20 years previously.

6.11. Oral health status and treatment

The oral health status of the group of participants who received dental care was determined by the number of decayed, missing and filled teeth (DMFT). The mean number of decayed, filled and missing teeth (DMFT) was 10. The lowest DMFT score was 1 and highest DMFT score was 24. The average number of appointments was 3 per patient, with some patients having up to 6 appointments to complete their dental treatment.

Posterior bitewing radiographs were taken for 21 participants. Periapical radiographs were taken for 6 participants. Periodontal disease was widespread in this group. Of the 28 participants who underwent the clinical dental treatment, 2 were completely edentulous and only one of these had dentures. The remaining 26 participants had gingivitis and/or periodontitis. The periodontal condition is summarised in Table 18.

TABLE 18: Periodontal condition

Periodontal condition	**Number of patients N=26**
Presence of gingival bleeding	26
Absence of gingival bleeding	0
Supra- or subgingival calculus	26
Periodontal pockets shalllow (4-5mm)	16 (8 had pocket depths <4mm)
Periodontal deep (6mm or more).	2

Clinical dental treatment included restorative dentistry, oral surgery (exodontia), periodontal treatment, endodontics, prosthetics and oral health instruction and advice. Some 18 participants required restorative treatment; a total of 56 restorations were placed, including 24 posterior and 32 anterior restorations.

A total number of 10 participants had a combined number of 21 teeth extracted; two teeth required surgical extraction, including a muco-buccal periosteal flap being raised with bone removal. All 26 dentate participants required minor periodontal treatment (scale and clean) to treat their periodontal disease; 14 participants had one appointment for scaling and cleaning; 4 participants had two appointments; and 2 participants required three appointments. The periodontal treatment need is summarised in Table 19.

TABLE 19: Periodontal treatment need

Periodontal treatment need	**Number of patients N=28**
No need for treatment because were edentulous	2
The need for improvement in personal oral hygiene	28
The need for improvement in personal oral hygiene plus the need for professional cleaning of the teeth	26
The need for improvement in personal oral hygiene plus the need for professional cleaning of the teeth plus OHI	26
Complex treatment including deep scaling, root planing, surgery	19

Two participants had endodontic work started on their anterior teeth but both failed to return to have this completed. There were 8 participants who required prosthetic dentistry: 2 were edentulous so had full upper and lower dentures; 3 participants had full upper immediate dentures; and 3 participants had partial dentures made for them.

At the end of each dental appointment, oral hygiene advice was given about tooth brushing frequency, tooth brushing technique, flossing, mouthwash use, and fluoride use. Oral health aides were also given to participants, including a toothbrush, toothpaste and a sample bottle of Savacol mouthwash if required. Instruction was given on how to use these. Sometimes toothbrushes were given for their tamariki in their whānau as well. Colgate sensitive toothpaste was given to participants for use at home, following their scaling and cleaning.

6.12 Phase III Post-dental treatment interviews

Following the completion of their dental treatment, the participants were referred back to the Māori Mental Health Team for a second interview. This was followed by the second dental health interview undertaken by the Māori Dental Health Team. The second mental health interview was a repeat of the HoNOS questionnaire.

Post-dental follow up for the Mental Health Team was problematic due to some participants withdrawing, or moving out of the area and their contact details changing, with several electing not to attend or respond to follow-up reminders. It became a matter of some concern because there was a reluctance on behalf of a small number of participants to undertake the second HoNOS interview.

Considerable trouble was taken to contact these participants and to engage in a dialogue with them to complete this interview. In the end, 3 participants agreed to do this over the telephone, which was not ideal. Of the 28 participants who had dental treatment, there were 4 participants who subsequently did not complete the second HoNOS questionnaire.

The data from the 24 participants who completed both the pre-dental treatment and post-dental treatment HoNOS questionnaire are presented in Table 20. The first column corresponds to their pre-dental HoNOS score; the second column represents post-dental intervention HoNOS score; and the third column represents the percentage functional change on HoNOS score from the baseline score. A reduction in HoNOS score indicates an improvement in functioning. The higher the percentage change, the higher the level of functional improvement.

TABLE 20: Pre-dental treatment and post-dental treatment HoNoS scores

Pre-dental treatment HoNoS score	Post-dental treatment HoNoS score	Percentage functional change
8	2	75%
4	3	25%
7	1	86%
3	0	100%
10	3	70%
16	4	75%
14	5	64%
8	5	38%
9	6	33%
7	2	71%
20	2	90%
10	3	70%
16	6	63%
3	2	33%
10	3	70%
10	2	80%
6	3	50%
3	3	0 (no change)
7	0	100%
2	2	0 (no change)
10	0	100%
10	4	60%
9	2	78%
8	1	88%

Of the 24 participants who completed the HoNOS scores, only two (8%) reported no change, meaning no associated improvement in functioning following the dental intervention. Overall the dental intervention did not result in any decline in functioning on the basis of the HoNOS in this sample, meaning the dental intervention was not associated with any measurable decline in functioning on all 12 domains. Overall, the change from the mean pre-treatment score of 8.8 (s.d. 4.4) to the post-treatment one of 2.7 (s.d. 1.7) represented a large effect size (of 1.4).

An important finding was that three cases (12.5%) reported a 100% improvement over their pre-dental HoNOS scores at follow up. Table 21 represents the breakdown in percentage functional change from the data set.

TABLE 21: Percentage functional change

Percentage improvement in functioning on basis of HoNOS scores	Number of participants N=24
0 (no improvement)	2
1-19%	0
20-29%	1
30-39%	3
40-49%	0
50-59%	1
60-69%	3
70-79%	7
80-89%	3
90-99%	1
100%	3

An important finding is that 18/24 (75%) of the participants recorded a greater than 50% improvement in functioning on the HoNOS scores following the dental intervention. This means that 25% (6/24) recorded a benefit in functioning of less than 50%. There were 14 out of the 24 participants who completed the second HoNOS questionnaire (58%) who recorded a functional improvement of greater than 70% or more. There were 7 (30%) (7/24) who reported a functional improvement of 80% or greater.

The Mental Health team considered a 5-point difference between pre- and post-dental intervention HoNOS scores as a level of significant functional difference following the dental intervention. On the basis of this definition, 16 of the 24 participants (67%) recorded a significant functional difference in scores following the intervention.

While there is a potential for rater bias in the study, all of the HoNOS interviews were conducted by the one psychiatrist (both pre- and post- the dental treatment intervention) who had previously undergone specific training for the HoNOS interview, and was blinded to the pre-dental treatment HoNOS score at the time of completing the post intervention HoNOS score. The psychiatrist did not see or access the pre-dental treatment HoNOS score at the time of the post-dental treatment interview was undertaken. The psychiatrist in this study uses the HoNOS interview routinely in his clinical work in the same manner (i.e. he is blinded to any previous score), thereby minimising any rater bias that may arise.

6.13 Second dental health interview

The second dental health interview was conducted after the tangata whaiora had completed their course of dental treatment. A total of 28 participants completed their dental treatment and responded to the second dental health interview.

This was a shorter structured interview than the first dental health interview with 6 questions. It was conducted kanohi-ki-te-kanohi (face-to-face) with the participants. The kōrero expressed by the participants were recorded by taking notes on the interview sheets. The participants could express more than one whakaaro (thought or impression) to the questions. The responses were transcribed to a master sheet from which the themes and topics expressed in the responses could be readily identified.

Te Whare Tapa Whā

The first four questions were based around the four dimensions of Te Whare Tapa Whā model of Māori health and well-being as a follow-on from the first dental health interview.

Q1. *What is the impact (if any) or your restored oral health on your tinana?*

A total of 27 of the 28 participants expressed positive comments on the impact of having their oral health restored on their tinana or physical well-being. Only one participant said having their teeth restored made no difference to them at all. The main impact expressed by the participants was that having a restored dentition made them feel good or great. The other impacts upon their taha tinana described by the participants was feeling more confident or experiencing an improved self-esteem. When these three descriptions are combined, two-thirds of the responses pertained to a self-reported improvement in their well-being. The results are in Table 22.

TABLE 22: Impact of restored dental health on te taha tinana

Nature of impact	**No (%) - N= 43** **(Total number of responses)**
Feeling good, great	12 (28)
Feeling more confident, improved self-esteem.	8 (19)
Feeling better, happier	8 (19)
Smiling a lot more	4 (9)
Able to eat properly	4 (9)
Particular about maintaining healthy diet	2 (5)
Will ensure that they look after their teeth	2 (5)
No longer any headaches	1 (2)
Happy to socialize again	1 (2)
Can sleep	1 (2)

Q2. *What is the impact (if any) of your restored oral health on your hinengaro?*

There were 20 responses to this question. By far the predominant response was similar to the previous question, in that the participants generally felt much better and had much more confidence in facing the world (85%). One participant said that they no longer had any worries about money to pay for dental treatment; another said their speech had improved. The data are presented in Table 23.

TABLE 23: Impact of restored dental health on te taha hinengaro

Nature of impact	**No (%) - N= 20** **(Total number of responses)**
Feeling confident	17 (85)
No monetary worries	1 (5)
Improvement in speech	1 (5)
Now know how to care for my teeth	1 (5)

Q3. *What is the impact (if any) of your restored oral health on your whānau?*

There were 23 responses to this question,and all were positive. Just over one-third (35%) expressed gratitude for the whānau support they had received for what was for many of them, an arduous process in undergoing their clinical dental treatment. An equal number of responses were that now positive oral behaviours had been instigated within their own immediate family. Some participants said that they were pleased that other whānau members had noticed a difference in their restored oral health, while other participants noted the improved family dynamics that had followed their dental care. The data are presented in Table 24.

TABLE 24: Impact of restored dental health on te taha whānau

Nature of impact	**No (%) - N= 23** **(Total number of responses)**
Grateful for whānau support	8 (35)
Instigation of positive oral health behaviours within the immediate whanau	8 (35)
Whānau noticed the difference in their oral health	4 (17)
Improvement in family dynamics	3 (13)

Q4. *What is the impact (if any) of your restored oral health on your wairua?*

Three participants stated that there was no impact at all of their restored dentition on their taha wairua; one participant was unsure; and two did not respond. Of the remaining 22 participants who responded to this question, there were 26 responses. Just under half the responses (46%) reflected a positive influence on their spiritual well-being, but a number of respondents were not able to articulate what that was exactly. Almost one-fifth (19%) of the responses were feelings of being “spiritually uplifted” since having undergone a dental rehabilitation. A number of participants expressed the feeling that having a restored dentition was all part of a holistic approach which definitely had an influence on their health and well-being. The data are presented in Table 25.

TABLE 25: Impact of restored dental health on te taha wairua

Nature of impact	**No (%) - N=26** **(Total number of responses)**
A positive influence	12 (46)
Felt spiritually uplifted	5 (19)
An holistic basis to improved well-being	4 (15)
A belief in a greater power that had a positive influence	1 (4)
New drive to maintain own teeth	1 (4)
No impact at all	3 (11)

Oral health attitudes

Q5. *Do you think it is important now to maintain regular dental care and check-ups?*

All 28 participants felt that it is important to maintain regular dental care and check-ups.

Q6. *Are there any comments you would like to add about your participation in this particular oral health programme?*

All 28 participants responded to this question. The comments were all very positive and appreciative and are detailed in the qualitative data presented in the Appendix. The only negative comment was that the dental treatment "*seemed to drag on for a long time that's all*." Considering the extent of the dental disease being treated in some of the participants, this was a fair comment.

6.14 Second Oral Health Impact Profile (OHIP-14) interview

There were 32 participants who undertook the OHIP-14 before dental treatment and 17 participants (53%) who completed the OHIP-14 after having had a full course of dental treatment. The reduction in the number of participants who responded to the follow-up OHIP-14 interview was due to the extreme difficulty that the field researchers had in maintaining contact with them. The delays in bringing this study to completion were something that none of us could have contemplated – contact with the participants after completing their dental treatment proved to be extremely difficult. It was due only to the diligence of the field workers in retaining participants to undertake the second OHIP interview, extending through to November 2013 that follow-up OHIP interviews were possible. Indeed, many of the participants' mobile telephones were mobile themselves, some passing through as many as four different people. A number of participants had "gone, no address" and many were transient. Finally, some participants just did not wish to undertake the post-dental treatment interviews and withdrew.

On the OHIP scale, a higher score indicates more negative impacts on oral health-related quality of life and a lower score, fewer. An important consideration when reporting from follow-up studies is whether there were any systematic differences in baseline characteristics between those who were retained and those who were lost to follow-up (Locker, 2000). Accordingly, the baseline characteristics of those participants who were followed up and those who were lost to follow-up are detailed in Table 26. These indicate that there were no systematic differences between them, suggesting that the failure to assess a proportion of the sample at follow-up did not materially affect the study findings.

TABLE 26: Baseline characteristics of those followed up and those not (brackets contain percentages unless otherwise indicated)

	Followed up	Not followed up	P value
Sex			
Male	6 (35.3)	7 (46.7)	0.513
Female	11 (64.7)	8 (53.3)	
1+ OHIP impacts			
No	12 (52.2)	3 (50.0)	0.337
Yes	11 (47.8)	6 (50.0)	
Mean OHIP score (sd)	22.6 (15.6)	28.2 (15.4)	0.321
All combined	17 (53.1)	15 (46.9)	-

The changes in the mean OHIP score for the group who were treated and responded to the second OHIP-14 interview were found to have demonstrated a considerable improvement in oral-health-related quality of life. Those data are presented in Table 27.

TABLE 27: Mean OHIP score at baseline and follow-up among those who completed dental treatment(brackets contain standard deviations)

	Before dental treatment	After dental treatment	P value	Effect size	Effect size descriptor
Mean OHIP score	22.6 (15.6)	9.5 (11.0)	0.002	0.8	Large
Mean subscale score in:					
Functional limitation	2.6 (2.5)	1.4 (1.5)	0.073	0.5	Moderate
Physical pain	4.2 (2.2)	1.9 (2.0)	0.002	1.0	Large
Psychological discomfort	4.4 (3.3)	1.5 (1.9)	0.004	0.9	Large
Physical disability	2.8 (2.3)	1.1 (1.7)	0.003	0.7	Large
Psychological disability	3.5 (2.9)	1.4 (1.8)	0.004	0.7	Large
Social disability	2.1 (2.3)	1.2 (1.8)	0.211	0.4	Moderate
Handicap	3.1 (2.6)	0.9 (1.3)	0.002	0.8	Large

The data above indicate that there was a large decrease in the overall mean OHIP score; this represents a considerable improvement in the participants' oral-health-related quality of life. The mean OHIP-14 score fell from 22.6 to 9.5.These improvements were observed in all 7 subscales, and all but two of these (functional limitation and social disability) were significant and represented large effect size. Overall, these data clearly demonstrate the positive impact of a restored dentition on participants' quality of life.

The changes in the prevalence of OHIP impacts are detailed in Table 28

TABLE 28: Changes in prevalence of OHIP impacts among those participants who were treated (brackets contain percentages)

	Before treatment	After treatment	P value
1+ impacts	11 (64.7)	1 (5.9)	0.002
1+ impacts in:			
Functional limitation	6 (35.3)	1 (5.9)	0.125
Physical pain	9 (52.9)	1 (5.9)	0.008
Psychological discomfort	10 (58.8)	1 (5.9)	0.004
Physical disability	5 (29.4)	1 (5.9)	0.125
Psychological disability	8 (47.1)	1 (5.9)	0.016
Social disability	3 (17.6)	1 (5.9)	0.625
Handicap	8 (47.1)	1 (5.9)	0.016

Among those participants who were followed up, the prevalence of impacts fell remarkably, from 65% prior to dental treatment to just 6% following dental treatment.

Overall, the changes in mean OHIP-14 score and in the prevalence of impacts indicate that the dental treatment was associated with a very significant improvement in participants' oral-health-related quality of life.

Some participant comments

The inclusion of an oral health screening during the admission process for tangata whaiora, followed by referral for dental care if required can be an important aspect of their journey to recovery, wellness and wellbeing. As a result of having his oral health completely restored, one participant stated, "It has been really good. Now the depression is back to basics; life is really great." The concept of Whānau Ora was also evident when a participant said:

We've actually put together a routine for my girl to brush her teeth every day.
I don't want her to go through what I did. (Oral health) is very important now.
All good, my whānau now looking at their own dental care.

It is worth noting some of the changes reported by participants in the before and after impact of their dental health rehabilitation:

Before:

(Because of my teeth) I put myself out of the picture

After:

It has been really good.
Now the depression is back to basics. Life is really great.
Dietician, nutrition still doing these things as well.
I feel it's all part of the whole picture as a person.

Before:

I won't get photos taken with the way my teeth look.
I'm looking forward to getting photos with my kids.
I wouldn't say as such but when I lean over to children
they can see the decay and discoloration;
they comment on, "Mum you're not brushing properly."
(I'm not) setting a good example for the children.

After:

My whānau spoil me.
My kids are happier to be with me.
They walk with me instead of behind me.

Before:

It is like musical teeth, sore here, sore down there, sore on this side.
(The pain) It just moves from one to the next.
Yeah, yelling at my kids, short tempered with them;
feeling like I'm not doing enough for them when they want to do things;
feeling guilty that I should be doing more with them.

After:

It's done a lot for my family as well.
I have a 2-year old girl and we make it family time now to share and to brush together.
We show each other our teeth and make it a fun (thing).
I want them to know how important it is

7 Discussion

This study was undertaken to determine whether providing rehabilitative dental treatment to a vulnerable group of tangata whaiora within Tauranga Moana (The Western Bay of Plenty) would contribute to improvement in their mental functioning and oral-health-related quality of life. Despite some practical difficulties in conducting the study, there were considerable improvements in both of those aspects following the dental treatment. The findings suggest that there may be a role for dental care in the management of tangata whaiora in the community, but that further work in larger samples is needed to confirm the effect. The sections which follow discuss the findings in more detail.

All participants recalled accessing dental care as a child at primary school. While most reported positive experiences, there were just as many negative experiences recalled. Most participants recalled being taught how to care for their teeth. From childhood to adolescence, there was a 50 percent drop-out rate in accessing dental care going from the school dental service to the adolescent oral health scheme. Of those who did access dental care, many participants recalled that the only reason they went was because of a necessary dental treatment. One participant reported not attending, owing to the mistaken belief that a payment was required. By adulthood, all but 2 of the participants reported that they did not have regular dental care. The only reason they sought dental care was to resolve a particular dental problem such as pain and toothache, infection, trauma, erupting wisdom teeth or difficulty with eating. The economics of dental care was often expressed and the cost of dental care was the main reason for not accessing regular dental care.

This lack of dental care was reflected in the oral health of the participants. Of the 28 participants who agreed to have dental treatment, two were edentulous, one of whom not have dentures. The overall oral health status of the 26 dentate participants was wanting: the DMFT average score was 10 with a range from 1 to 24. Periodontal disease was widespread throughout the group with all participants having the presence of gingival bleeding and supra- or sub-gingival calculus. There was a need for an improvement in personal oral hygiene, professional scaling and cleaning and oral hygiene instruction, all of which were undertaken during the course of dental treatment. Other required dental treatment included restorative dentistry, exodontia, and prosthetic dentistry. The pre-dental treatment interviews elicited a number of negative responses such as constant referrals for pain, discomfort, toothache, bad breath as well as poor self-esteem and a lack of confidence. As a result, some participants described themselves as being grumpy, not functioning well in the home or having a desire to isolate themselves from their social environment.

The participants were questioned on the impact of their own oral health upon the four aspects of Te Whare Tapa Whā model of health and well-being; taha tinana, te taha hinengaro, te taha whānau and te taha wairua. This was in line with the kaupapa Māori approach to this study.

The impact of the status of their oral health upon their tinana elicited a variety of responses. For some participants, it had a generalized impact upon their whole body, whilst for others the impact was confined to a specific region of the body such as the neck. A number of participants reported having associated headaches, difficulty with eating, sleep deprivation and affecting the mind and mental function. Some participants described their method of coping with dental discomfort by isolating themselves from their immediate social environment.

Although three-quarters of the participants in this study were aware of fluoridation the water supply in Tauranga where this study was conducted is not fluoridated. The tangata whiaora as with the entire local population was not exposed to this beneficial public health measure.

There was an association expressed by the participants between their oral health and te taha hinengaro, their mental health and wellbeing. Having poor oral health or a dental problem preyed upon the participants' minds to the extent that it affected their self-esteem and they became self-conscious. For other participants, they couldn't bear thinking about it, but the continuing pain was a constant reminder of their problem.

Te taha whānau (the family or social dimension) was impacted upon by the oral health problems experienced by the participants. Some participants chose to physically isolate themselves from other whānau members during bouts of toothache, while in other cases there was a negative effect upon the participants' own children or the social dynamics within their immediate whānau. On the positive side, whānau were able to provide advice and support. Some whānau members were able to pay for the cost of much-needed dental treatment.

Half of the participants expressed a viewpoint on the impact of te taha wairua, the spiritual dimension and their oral health. It was, in the main, an acknowledgement of the spiritual world and that the spirits can be called upon in times of stress, such as when going to the dentist or having toothache.

In the post-dental treatment interview, there was a significant change in the participants' language when asked about their oral health and its impact upon their health and well-being. Negative words such as "pain" and "toothache" were not used. However, given that oral hygiene instruction and education was provided as part of the dental treatment, it was something of a paradox that very low numbers of participants felt that the intervention had actually given them a new drive to maintain their own teeth, to ensure that they looked after their teeth or now know how to care for their teeth. The questions posed in this phase of the research required open-ended responses; the participants were not given a set of closed response options. However, all participants reported positive oral-health-related responses in respect of their tinana, hinengaro, whānau and wairua.

The Health of the Nations Outcome Scale (HoNOS) was a useful tool to investigate any change in psychosocial functioning before and after having dental treatment. While there is a potential for rater bias in the study, all the HoNOS interviews were conducted by the one psychiatrist who had undergone specific training for the HoNOS, using the interview routinely in his clinical work. The HoNOS interviews were conducted blind in that the psychiatrist did not see the pre-dental treatment HoNOS score at the time the post-dental treatment interview was undertaken, therefore minimising any rater bais.

Taking into consideration the pre-dental treatment and the post-dental treatment HoNOS scores, it is not unreasonable to presume that the dental treatment may well have contributed to a functional improvement. There were only 33% (or 8 of the 24) of participants that had a change in score of 5 points or less. On the basis of the HoNOS scores, the majority of the participants who completed both the pre- and post- HoNOS interview did show a distinct positive improvement in their psycho-social functioning. Given that this cohort of participants was a community sample only (not in-patients) there was less complexity to their illness. The HoNOS is considered a meaningful outcome measure and the approved outcome measure advocated by the Ministry of Health in mental health services throughout New Zealand. The HoNOS is implemented in all DHB's and used on a daily basis by mental health clinicians. Therefore in a clinical and real life setting, this functional outcome scale is regularly audited and provides meaningful data to assess consumer progress over time. There are statistical limitations in this study given the small

sample size but there is also clinically important data that suggests that further research is required to investigate the relationship between oral health of tangata whaiora and their mental health wellbeing.

All of the 17 participants who completed all phases of this project (the pre-dental treatment interviews, and the dental treatment followed by the post-dental treatment interviews) reported positive oral health outcomes. These included a self-perceived improvement in their own confidence in facing the world, improved self-esteem, and being better able to cope better within aspects of their personal lives, including their relationships within their whānau.

A particular aspect was knowing that they had a completely restored dentition achieved for them at no personal financial cost. As a result, some participants expressed a commitment to maintain good oral health, not only for themselves but for their whānau as well.

Overall, the research aims of this study have been met. First, the impact of oranga niho on the quality of life of tangata whaiora was investigated. The Oral Health Impact Profile data demonstrated that poor oral health did have an impact. For example, three-quarters of the sample had one or more impacts on any of the 7 OHIP-14 domains prior to the dental intervention, yet that proportion fell dramatically following the provision of dental treatment. It is noteworthy that the pre-dental treatment OHIP-14 prevalence found in this project was considerably higher than that reported for Maori adults in the 2009 National Oral Health Survey. However, since the sample size in this particular study was very small, such a comparison illustrates a need for further research with a much larger study to provide more in-depth data. Second, the dentitions of the research participants who continued with the study through to completion were restored. The self-reported impact of their restored oral health was assessed through a qualitative research process which revealed that, in the main, the response was very positive. As one participant stated, "…it's been so great to help improve my depression…my personal being and development has improved…it has played a part in my recovery from depression."
Third, the kaupapa Māori methodology was the poutokomanawa or backbone of the project. This was intended to uphold tikanga Māori and te kawa o te marae.

Challenges of the research

In undertaking this project, it became very evident from the very beginning that there were particular issues that, while anticipated initially, proved to be all too true. It was apparent early in the research that the participants were a very vulnerable group of people, given their medical histories and social backgrounds. Dr Tony Ruakere (1998) had reported that an examiner of the Royal NZ College of General Practitioners, in a review of his New Plymouth-based Te Atiawa Medical Centre, stated that, "I have never seen so many systemic diseases in one surgery session anywhere else in New Zealand (Diabetes, Emphysema, Asthma, Hypertension, Coronary Artery Disease, Drug Addiction, Auto Immune Disease, Heart Failure…)". Accordingly, it was anticipated that a number of the participants in the current study may have other health pathologies, such as diabetes or heart disease, in addition to their mental health problems and diagnoses.

The Tauranga Moana-based research group are (in the first instance) clinicians, not researchers. Hence, this project was a step in a very new direction for them, comprising a major learning curve. An appropriate training workshop was conducted for them in Tauranga, and this included training in conducting participant interviews. That they managed to generate very rich and original data from the qualitative interviews demonstrated their commitment to the project, despite their usual contractual clinical responsibilities.

Retention of the participant group was a particular challenge. With the original research design having only 30 participants, 40 were recruited to compensate for an anticipated fall in

retention over the course of the study. The time required to conduct this research and the available funding (most of which was recognised as needing to be allocated to dental treatment, given the expectation that the tangata whaiors would have unmet dental need) precluded the sample size being any larger. Of the 41 participants originally recruited, 13 withdrew for a number of reasons

A further 4 participants withdrew after completion of their dental treatment. Some participants became very difficult to maintain contact with, despite the efforts of the project coordinator to do so. Indeed, many participants' mobile telephones were passed around to different family members a number of times, which made keeping in direct contact with the tangata whaiora very difficult.

Maintaining appointments also proved difficult. For both the Mental Health Team and the Dental Health Team, there were "no shows" for agreed appointments; the participants were not at home or had "gone no address" when the coordinator made several home visits; or there was no response to telephone calls or text messages. Kiseley et al (2011) reported that people with severe mental illness may also have priorities other than their oral health. That this study revealed continuing difficulties in maintaining contact with the tangata whaiora and in compliance with dental appointments supports this notion. To overcome this difficulty, the intervention of kaumātua was called upon, with those individuals asked to kōrero with the tangata whaiora for them to continue with their dental treatment.

Finally, post-dental follow up for the Mental Health Team was problematic due to some participants withdrawing, moving out of the area and contact details changing with several electing not to attend or respond to follow up reminders. It became a matter of some concern that there was a reluctance on the part of a small number of participants to undertake the second HoNOS interview. Both the Mental Health Team and the Dental Health Team had to go to great lengths in order to engage the participants to complete the follow-up interviews. The post-dental treatment mental health interview (HoNOS) was undertaken as before, face-to-face interviews with the psychiatrist. However, retention problems meant that the last 3 HoNOS interviews and oral health interviews had to be undertaken over the telephone, which was not at all ideal. However, there is no convincing evidence that the mode of administration for OHRQoL scales has any influence on participants' responses, and so this is unlikely to have affected the data, especially given the large effect sizes which were observed in the study. Any minor error which might have been encountered would have been unlikely to have affected the data, and the mode of administration remains a theoretical concern only.

It was disappointing that only 17 participants completed all three phases of the study, undertaking all three post-dental treatment interviews. It was anticipated from the outset that some participants would withdraw at any time for their own reasons, but the extent to which this did occur is recognised as a limitation of the study. Despite that, the findings do provide some insight into the oral health status, oral health attitudes and behaviours and dental treatment needs of this particular Tauranga Moana-based group of tangata whaiora.

It was against this background that the project was undertaken. All of the participants in this study had dental treatment needs, with some requiring extensive oral rehabilitation. Most reported having suffered from toothache at some stage in their life with some putting up with the discomfort for considerable periods of time.

The low participation rate does make it more difficult to draw conclusions as to the effectiveness of the intervention, but (as discussed earlier) the failure to identify any systematic differences in the baseline characteristics of participants who did and did not complete the project suggest the data are robust, and that the intervention was certainly very effective in improving the participants' OHRQoL. This was an important dental intervention to

address the oral health of a disadvantaged section of the population, and the findings also suggest the possibility of positive flow-on effects for the mental health of those undergoing treatment. The research also shows that it is difficult to maintain engagement with this population group, and that extra efforts will need to be made to ensure that tangata whairoa have the opportunity to access and complete dental care.

A further limitation of this study was that the post-dental treatment OHRQoL survey was conducted from 1 to 6 months after participants completed their dental rehabilitation. The time frame varied to this extent because of the difficulty that the research team had in maintaining contact with the participants. Ideally, the post-dental treatment interview should have been conducted after one year had passed, but this was not possible because the entire project was required to be completed within a 1–year time period.

At best, it is realised that the post-dental treatment OHRQoL survey can only be regarded as an immediate impact of having a restored dentition. Nevertheless, more proximal experiences tend to outweigh those further in the past, and we are reasonably confident that the observed changes were a fair reflection of the day-to-day lives of the tangata whaiora at the time of measurement.

Despite the small number of participants and the limitations of the study, the results indicated that many tangata whaiora have unmet dental treatment needs which impact upon their general health and well-being as defined by Te Whare Tapa Whā. Following a complete dental rehabilitation, there was a clear indication that there was an improvement in their attitudes and beliefs, and for some participants an intention improve practices to maintain good oral health.

Strengths of the research

The principles of whakawhanaungatanga and manaakitanga were the mainstays of the implementation of the study. An important aspect was the role of kaumātua, who were invaluable in providing support and encouragement for a small number of tangata whaiora unwilling to complete their course of dental treatment. The Mental Health Team and the Dental Health Team went to great lengths to uphold the mana of the tangata whaiora and to ensure that none of them became whakamā for any reason. That this was done reflected both the professionalism of the research team members and their inherent Māori identity. The principle of rangatiratanga was reflected in the ownership and leadership of Te Manu Toroa in undertaking this project. This project provided the opportunity for the Māori health provider, Te Manu Toroa, to actively engage in and own a kaupapa Māori health research project. Despite some difficulties that arose during the course of the project (mainly in maintaining contact with the participants), their commitment ensured that the aims of the project were met. The research team members became very resourceful and enterprising in maintaining contact with the participants, especially for the post-dental treatment interviews.

An important aspect of the kaupapa Māori approach to this project was the development and implementation of the dental health interview questionnaire, which included questions based on Te Whare Tapa Whā model of health and well-being. The interviewers felt very comfortable in undertaking these interviews and the questions elicited responses from the participants that were appropriate and meaningful in a rangahau hauora Māori context.

The principle of whakawhanaungatanga within this study — through the working partnership between the University of Otago, Te Manu Toroa, and the Bay of Plenty District Health Board Mental Community Mental Health Service — worked very well. The key element here was the project coordinator who liaised between the Mental Health Team, the Dental Health Team and the University of Otago-based researchers.

8. Conclusion

All tangata whaiora in this study followed a pattern of access to dental services that was not atypical for many disadvantaged groups within the New Zealand population. They had accessed dental care as children through the School Dental Service, but many dropped out or did not access dental care as a rangatahi under the Adolescent Oral Health Scheme. As adults, they had accessed dental care only for emergency treatment or when a particular dental need arose. Consequently, the majority of the participants recruited for this study had relatively high unmet dental treatment needs. The main reason for not accessing any form of regular dental care was that they did not have access to an affordable dental service. This group of Māori mental health patients had relatively high unmet dental health needs.

The tangata whaiora reported a wide range of responses to having undergone a complete dental rehabilitation at no financial cost to them. From a dental health perspective, there was a range of positive health outcomes for the individual tangata whaiora as defined by Te Whare Tapa Whā, (te taha tinana, te taha hinengaro, te taha whānau, te taha wairua). There was also a commitment by some of the tangata whaiora to not only maintain their own personal oral health but to institute positive changes within their own whānau to maintain positive oral health behaviours.

The responses to the dental rehabilitation (from a mental health perspective) suggest that there was indeed a functional improvement as determined using the HoNOS scale. However, this improvement does not necessarily mean that the dental treatment "caused" the improvement, but there appeared to be relationship. From a psychosocial perspective, there appeared to be a significant functional difference following the dental intervention.

The findings from both the mental health interviews and the dental health interviews revealed that each was a confirmation of the other; with their having suffered from a neglected dentition, a complete oral health rehabilitation did have a positive effect upon participants' health and well-being, as defined by Te Whare Tapa Whā.

The most significant finding of this study was the marked improvement in the participants' oral–health-related quality of life after their restoration to a healthy dentition. The challenge now is to maintain the oral health of those study participants.

The main outcome of the study is that pathways could be built that would lead tangata whaiora to protect and maintain their oral health as part of their journey to wellness. This is in line with Kiseley's 2011 proposal that "consideration of oral health should be part of a comprehensive assessment of patients with severe mental illness." Even though Kisely (2011) defined "severe mental illness" as a primary diagnosis of dementia, schizophrenia, bipolar affective disorder or other affective disorder", an oral health screening should apply to all tangata whaiora. Subsequently, tangata whaiora should be encouraged with the support of whānau to seek and follow through with dental care. By including an oral health screening as an integral part of the management plan for tangata whaiora, there is the potential for a positive impact on their journey to recovery, wellness and wellbeing. As one participant stated after his/her dentition was restored:

It's been awesome
A lot of positive changes.
And it does a lot for your self-esteem as well.

This study, in the main, was a qualitative research project in which the thoughts, experiences, attitudes and behaviours of a sample of seventeen Māori mental health patients were elicited, both before and after receiving a complete course of dental care This was challenging research, particularly around maintaining contact with the tangata whaiora, which resulted in a low participation rate[1] and changes to how the questionnaires were administered (face to face and then telephone; extended timeframes to collect the data). The small sample size was determined because the study was to provide an insight into the oral health needs of tangata whaiora from which a more comprehensive study could be developed. With regard to this, the study outcome does provide some valuable insight into the oral health and treatment needs of tangata whaiora.

[1] 13 participants withdrew from the study at different times for a variety of reasons, resulting in only 28 of the patients completing dental treatment and 17 completing all post dental treatment interviews.

9. Recommendations

9.1 That further research should be undertaken on the oral health of tangata whaiora that can inform the development of strategies and options for them to maintain good oral health, starting with investigating whether tangata whaiora entering either in-patient or community-based mental health services should be screened with regard to their oral health needs and if necessary followed up by referral to a dental clinical service for dental care.

9.2 That further research should be undertaken on the application of Te Whare Tapa Whâ model of health and wellbeing to kaupapa Mâori health surveys and questionnaires.

9.3 That further research be conducted into the most effective ways of ensuring cohort retention in prospective studies of tangata whaiora.

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APPENDIX I: First Oral Health Interview Pre-Dental Treatment: Qualitative Data

The first set of questions was concerned with their previous dental histories and experiences; the second set of questions explored the relationship between oral health and Te Whare Tapa Whā model of Māori health and well-being; the third set of questions were concerned with oral health behaviours, knowledge and beliefs.

5.5.1 Dental care as a child

Q1. Do you remember going to the School Dental Clinic when you were a child at primary school? Can you tell me about that?

All participants had had dental treatment as a child by the school dental service. Overall the responses were generally positive as many could recall receiving a bumble bee from the dental therapist at the completion of their treatment:

I went to Brookfield. Yeah she was pretty cool
It was scary at first but she would make little buzzy bees and that made it less frightening.

I used to like it when they used to pull your teeth out and they used to give us a bumble bee.
Made you want to go to the dentist and she was nice.

Well I remember everybody though that going to the dental nurse was scary.
The noise was very scary; scary noise and just being scared when I went to the dental nurse.
I guess I remember the little bee that everyone got.

I just remember they used to make those dragonflys out of cotton wool.
I used to like the taste of the toothpaste.
But I always had good teeth and never had to have fillings.

They just drilled and injected with long needles and did fillings.
Got a bumblebee afterwards.

However, not all participants recalled going to the school dental therapist as a positive experience and the term “murder house” was expressed:

They called it the murder house and they literally tortured us with drills and that.
They literally tortured the kids.

Yes I do (remember the school dental clinic) I very much do.
First in last out. We used to call ours the murder house.

The negative descriptions of the dental experiences as a young child were “scary,” “horrible,” “dreadful,” “terrible,” and “disgusting”.

It was horrible. Called it the murder house. I hated it. Was a terrible time.
She was a grumpy lady. Not very nice.
I hated injections and fillings and the drill. That was the worst.
Yeah it was horrible, It sucked. I don’t know why.
The notebook used to come around and we wondered who would be next.

However, the recalled experiences were not all bad as one participant said:

Yes. I loved it. I loved going to the dentist when I was a child. I remember making her things. We would also leave with something; balloons with smiley faces and messages or something on it.

Q2. Did the School Dental Therapist/Nurse teach you about looking after your teeth?

The participants recalled that the School Dental Therapist/Nurse had taught them you about looking after their teeth. Most of the responses were positive:

They taught us that eating apples was good for our teeth and like brushing after eating sugar.

Dental nurse, um just the basics brushing twice a day.
Just reducing sugars, that’s all.

Yes, Brush every day, three times a day; eat proper food and floss.
Yes. She used to show us pictures (of) what to do.
She used to ask us questions.
If we got it right we got a sticker.

Yes all the time. Yeah.
But one good thing our mum did.
She used to get these calcium tablets.
We used to have one a day.

However, there was the one very negative response:

Yes. She didn’t tell me anything;
she taught me once I left school not to go back to anyone again.
It’s destructive and demoralizing.
I learnt to smile in a way to hide my teeth.

Conclusion:

All participants recalled accessing dental care as a child at primary school. Whilst most reported positive experiences there were just as many negative experiences recalled. Most participants recalled being taught how to care for their teeth.

5.5.2 Dental care as an adolescent

From age 12/13 New Zealand School Children can access free basic dental care up to their 18th birthday through the previous Dental Benefit Scheme, now known as the Adolescent Oral Health Scheme.

Q3. Do you remember going to the dentist when you were at high school? Can you tell me about that?

Just over half of the participants said that they did not have any dental care as a teenager at high school or they could not recall having done so. Thus in this study there was a 50 per cent drop out rate in accessing dental care under the School Dental Service to accessing dental care under the Dental Benefit Scheme. This result shows a similar trend to other research surveys on access to adolescent dental services (Broughton 1998).

No I didn't go to a dentist. I didn't even get my body checked out.
I went to college, um, I been to heaps of schools, um Hilary School, no dentist there.
I think the last time I went to the dentist was at primary school.
Yeah, I don't remember going after that.

Nothing. I don't think I went.
In fact those teenage years at high school was probably the worst time for teeth brushing.
Sport orientated: get up, one toast, then just go.

No I never went to a dentist at all. I don't remember going to a dentist.
The school board didn't send out notices.

A number of participants recalled their experiences of dental care as a teenager:

I remember going and getting a couple of fillings & teeth cleaned once a year
Yup. Well, um, we saw a guy and we used to get treatment with him.
He had a clinic in Te Puke and I saw him every year for like work, it wasn't voluntary,
I had to go.

A couple of times I think.
Only because my parents made me.
Mind you, my teeth were perfect when I was at school.

Some participants who did access dental care as a teenager reported that they did so only because of a particular dental treatment need:

When I was young I was in a bind and a dentist pulled out my front teeth.
Later on I got crowns.

Pretty much went when I had major toothache or something.
Nothing else.

I do remember going to the dentist for recurring abscesses under the gum.
They would just drain it and it would heal.
I think that was when they noticed overcrowding at that time, but that would cost my parents.
They suggested to have two removed to make space.
Then my daughter has exactly the same problem as me.
I had to get a few appointments done.
Got beaten up outside my house, got caps done. Was 3rd form or 13.
Pulled nerves out or something, four front teeth.

Um okay at college – the only time I can think was when I got this front tooth knocked out and I had to get it redone.
That's the only time I can remember.

When I was 13 or 14 I had a toothache and went to the hospital.

One participant recalled that in their view there was a cost to accessing dental care as a teenager:

You had to pay then.
I only went at primary, and intermediate.
At college you had to pay and that was it.

Conclusion:

There was a 50 percent drop-out rate in accessing dental care going from the school dental service to the adolescent oral health scheme. Of those who did access dental care many participants recalled that the only reason they went was because of a necessary dental treatment need. One participant reported they they did not attend as there was the belief that a payment was required.

5.5.3 Dental care as an adult

In New Zealand publicly funded dental care for an adult is only available for some hospital patients, some special needs patients and for maxillo-facial and some hospital-based oral surgery. ACC does cover some costs for dental injuries due to an accident. Some financial support is available from WINZ for those people who qualify. In the main, the cost of dental care for adults is the responsibility of the individual.

The participants in this study were asked if after they left high school did they continue to have dental care as an adult?

Q4. After you left high school did you continue to have dental care as an adult?

Just over half the participants reported that they did not seek any ongoing dental care after they were an adult:

It was when free dental care at school stopped – that's when I stopped.

No – only when I had problems. I didn't go for check-ups.

No I haven't. Not for a check up or anything like that.

Na, I'm too scared. But now I do want to.
I don't remember owning a tooth brush or tooth paste.
I had some teeth taken out.
I didn't know it was important to take care of teeth.
By (the time I was an) adult I realized how important it was to have good teeth.
Never had toothache!!!

A number of participants stated that they did not seek regular dental care because of the cost:

I haven't been for about 8 years and it's far too expensive.

No. Once it was my free choice I didn't (go). And I didn't have enough money.

I haven't had proper dental care because of the cost.

Those participants who did seek some form of regular dental care described their rational for doing so:

Q5. If you did have regular dental care can you tell me about that.

I had like 12 monthly visits, so like a visit every 12 months and I got maintenance work done.

Aaah yes as an adult I finally had to have my front teeth out cos' I've got false teeth.
I wanted to keep that up and have regular check-ups.

I would say I had a few appointments as an adult.
Goes to the dentist when you have a bit of plaque and bleeding teeth.

Two participants reported accessing dental care as an adult through other services that they were engaged with:

I went a few years ago at Greerton through the mental health team.
Maybe got tooth pulled out at 25-ish.

Got heaps pulled out in jail about 9 years ago.
I went inside for the first time for about 12 months.
I haven't eaten properly since then.

One participant was able to access dental care as he was in the NZ Army:

In the army. Yep, just kept getting it checked and looked after.

Q6. If you did not have regular care as an adult, have you ever needed to go and see a dentist? Can you tell me about that?

A number of participants reported only seeking dental care as an adult for emergency dental care or when they had a particular dental problem that needed addressing:

I only went as an emergency.

Only um for emergencies which was 3 wisdom teeth extractions which they just crumbled.

I just went when I needed to get something done.
No not regular care; only for toothaches.

I only went when there was pain.

Yes, yes I did. I had 4 wisdom teeth that needed to be taken out – at a Greerton dentist.

Yes, after I left high school I was still looking after my teeth.
I had toothache and went to the dentist and he pulled it out; 16 or 17 years old.

Only when I got my false teeth on – around 18 or 19 years ago.

Of those participants who did access dental care for a particular dental problem they were able to do so through funding being made available to cover the cost:

Yes, yeah. This fulla called Harris in Katikati. I used to go to him; he gave you gas.
I was on medication and too nervous to go to the dentist.
I've received that $300 advance (from WINZ).

I had to get a WINZ quote. – I just went when I needed to get something done.
Aah, through work and income I had a root canal.
I was pregnant at the time. They got me to have a root canal.

There were a number of comments made about dental care as an adult:

I did go to the dentist, but I didn't go every year.
For about 10 years I didn't get anything,
then I had to get teeth pulled out because the braces caused decay in my molars. I had pyorrhea as an adult so I wanted to brush regularly but I had holes and got fillings; that was in my late teens. Had both wisdom teeth taken out.

Umm, 'cause I had fillings, no I had a chipped tooth.
Got a capped tooth.
Fell off the motorbike.

I had two teeth taken out then in my thirties I had the lot taken out.

The economics of dental care was often mentioned:

I went just annually for a clean and a check.
I got a discount.

I've been a client of community mental health.
I didn't know I could have had cheaper dental care.
My care manager had arranged things for me with a dental clinic.
When I got an ACC payout for a difficult injury my partner talked me into getting my teeth fixed, ones that were hurting me.

My parents paid for all my mercury filings to be replaced by white fillings.
It was recommended that it might cause my mental illness.

It was my wisdom tooth; I pulled half of it out.
That cost heaps. I got one pulled.
WINZ said they would pay.

I had to get a WINZ quote to have 4 wisdom teeth out.
First time it cost $1500 and I did it without pain relief because I thought it would be cheaper.
It wasn't. I cried when I realized.

Throbbing pain top tooth. It was my first year of study.
I tell a lie, wisdom teeth pulled out and WINZ paid for that one. I must have been in pain.

At age 28-36 I used to go February and October when I had a business and dollars.

A number of participants who had had dental care as an adult stated that they reason they sought dental care was for extractions:

Yup. I had wisdom teeth taken out last year.

Yeah, I went a while ago when they took out teeth.
Yeah 5 weeks ago they pulled out the teeth, sore as.

Yep. Generally for getting teeth pulled and for those big things that make your face swell.

My teeth always crumbled and my front teeth were pulled out.

Yes, for the wisdom teeth extractions. Still got one left.
The three extracted were crumbly and chalky.
It's inevitable this one will go the same. So they have to take that tooth.

I never had toothache at high school.
At 20 I had toothache but I was pregnant and ended up getting that tooth ripped out.
It was one of my back molars.
Yes I pulled half my tooth out myself.

At 29 I got my top teeth ripped out.

I had brittle teeth and I was told I had something wrong with my gums.
I didn't like the dentist that's why I didn't go regularly.
They weren't sore. They looked ugly.
And I don't smile plus I worked in customer service.

Yeah. I was eating a cracker and my wisdom tooth shattered so I had to get it ripped out.

The participants were then asked about their experiences of any particular dental problem.

Q7. Have you ever had toothache, or any other dental problems?
Can you tell me about that?

A number of participants in this study described the nature of dental problems they had experienced as an adult. It was, in the main, pain and toothaches, bleeding gums or wisdom teeth. Other dental problems were oral trauma, a broken tooth, dental infection, and difficulty eating. One participant reported having dental problems associated with her pregnancy.

Pain and toothaches:

Yes. Went to the dentist straight away. I can't stand the pain.

Just the problem I had on the left side of my face.
I got pain on my left side and pain behind my eye,
and when I got my ACC payout I used that money to fix my teeth.

I had a bad tooth ache and it got bad and it abscessed.
I ended up having a root filling.
They had to do like a root canal and they kept working on it.

When yep, um just over time it starts crumbling (my teeth),
it hurts – gets unbearable – then I go see a dentist and get it pulled out.
Pain killers are my friend.

Yeah heaps of tooth ache; back teeth;
wicked as, going and buying panadol; took four, did nothing.

Yes. I grimed and beared it and used all the remedies you can think of.
The garlic, toothpaste on the teeth, panadol and pliers when I pulled the teeth out myself.

The only reason I went cos' I had a toothache.
My mum wanted me to go before I was 18 but it didn't happen.

Just the past 2 or 3 weeks my tooth has been sore.
The first toothache I had.

Yes, it hurts. I have one now.

I've pulled out a few teeth.
I've got a few holes;
they're sore but okay at present.

I get pain down here and in my upper front and lower front teeth;
and getting pain when I eat.

Wisdom teeth:

Yes. Was just my wisdom tooth.
When I went to the dentist and then he couldn't do it and said come back in a couple of days,
but the pain went away so I didn't go back.
Plus I didn't want to.

One of them (wisdom tooth) comes up.

My wisdom teeth.
Um I've still got all my teeth but food gets stuck in my wisdom tooth.

Gum problems:

Never had a toothache. Had bleeding teeth problems.
Yes, always have problems.
My tongue is pierced so when I get anxious I push it on my gums.
My gum hurts so I have taken it out.
I forgot to put it back in today.

Trauma:

I grew up in Kawarau.
My teeth got broken in fights.
Broke my jaw.
I was kicked in the head.

Broken tooth:

I went to fix a broken tooth.
You really have to stay on top of these things

Infection:

I had a filling fall out and it got infected and my sinus blew out.

Yes, First time was in the South Island. I was about 20. It was a bad experience.
Yeah, mm, my whole side of my face swelled up AFTER I had dental care.

Oh I've had all my wisdom teeth taken out under General Anaesthesia.

Over Christmas I cried in so much pain.
Four out altogether; he was a butcher; I got an infection.

Difficulty eating:

When I talk I spit through my bottom teeth.
Sometimes I trip over my lip and slur my words.
Discomfort; I can't chew on this side at the back.

I had toothache years ago in my early 20s
Now it's only when I disturb it.
I can't have sugar or hot cold stuff.
Certain foods I can't have.
I haven't chewed on that side for ages.
You know if you eat sweet stuff – you want it but you can't.
I contributed to bad eating habits.
Medications over the years played a huge part in the deterioration of my teeth causing severe teeth grinding day and night.
This caused many dental problems and brittle teeth and wearing them down.
Now I'm avoiding some foods fearing my teeth will break off.

Pregnancy:

Rotten teeth. Yes.
I used to have calcium issues when I was pregnant;
you know how the baby takes calcium from you.

One participant associated dental problems with the life style factors of diet and smoking:

Look I've got nicotine stains and stuff;
I'm a smoker and eat chocolate and stuff.
I had two teeth taken out then in my thirties then I had the lot taken out.

For those participants in this study who had a particular dental problem they were asked:

Q8. What did you do to get things fixed up for you?
Can you tell me about that?

The respondents described their management of the situation through the administration of pain relief or having dental extractions:

Pain relief:

I took Ibuprofen and made an appointment straight away.

I just took the panadol and things like that.
Yeah I went to the dentist.
I just used pain killers and oil of cloves.
I'd never heard of it until my husband told me.

In those days I used bread to stuff in it or baking soda or take panadol.
I couldn't afford it (dental care).

I just take panadol and handle it.
Otherwise I just leave it, the teeth, and then the pain goes.

Extractions:

Dentist in Greerton pulled my wisdom tooth out.

Just got them pulled out, not filled.

Got my wisdom tooth pulled out.

Well yeah I got a root filling and they kept working on it
and it eventually got abscessed and so they ended up pulling it out.

One participant described extracting their own teeth themselves:

I just came and pulled my own teeth out; that was 2 years ago.

However, the economics of dental care was an issue of major concern for many participants needing dental care:

I did nothing other than get a WINZ advance; that was in the past.
I can't go for anymore (funds).

When I was 23 the dentist gave me a quote but lied about it being cheaper without pain relief.
I had to go through emergency dental subsidy as I needed wisdom extractions.

Yeah, I used my ACC money (to pay for the dental care).

When I was in my college years they referred me to the hospital.
I couldn't afford to pay for it.
It was only $40 to have it done at the hospital.

I went to the dentist and it cost me $500 to have them taken out.
They referred me to a dental surgeon.

Some participants did not seek any dental care at all after suffering dental pain:

Just didn't bother; it went away.

Booked appointments, never ended up going.

I thought about it and the holes probably still there
but I just must've gotten used to the pain.

I just bear the pain.

Another participant described the positive experience he had after seeking dental care:

I had an abscess in Nelson and went to another dentist and it was magic.
He was mean; he was the man.
I didn't feel anything only tiny pricks and then it was out.

Conclusion:

Most of the participants in this study reported that they did not have regular dental care as an adult. The only reason they sought dental care was to resolve a particular dental problem such as pain and toothache, infection, trauma, erupting wisdom teeth or difficulty with eating. The economics of dental care was often expressed and the cost of dental care was the main reason for not accessing regular dental care.

5.5.4 Te Whare Tapa Whā

Te Whare Tapa Whā is a Maori view of health and well-being based on four cornerstones:
Te taha tinana, the bodily or physical dimension;
Te taha hinengaro, the mental and emotional dimension;
Te taha whānau, the family or social dimension; and
Te taha wairua, the spiritual dimension. (Durie 1985)

The participants were asked to comment on aspects of their oral health within the framework of Te Whare Tapa Whā. The initial question asked the participants if they were familiar with the concepts of Te Whare Tapa Whā.

Q9. Have you heard about Te Whare Tapa Whā – our Maori view of health and well-being? Te taha tinana, Te taha hinengaro, Te taha whānau, Te taha wairua.

Just under half the respondents said that were not aware of this concept. A number said they had ("Ohh are you talking about the house. Yeah") and learnt about it through various courses they had attended. One participant described Te Whare tapa Whā in these terms:

Well I have heard of everything being interconnected.
I agree that everything is interconnected and I agree, you know,
but if you have teeth problems it can give you blood problems.
I mean, even my mercury filling.
I know that it's only a little bit but every time I drink it goes down,
That is, the mercury into my system.

The participants were then asked about their own oral health in relation to the four corner stone of Te Whare Tapa Whā.

5.5.5 Oral health and te taha tinana

Q10. What is the impact (if any) of your own oral health on your tinana?

Some participants referred to the impact of an oral health problem such as toothache on their whole body system:

Well you don't feel well;
you get it sorted out before it gets worse.

Gets you down. Almost like when you got no energy.

Well toothaches are very uncomfortable so when you have a toothache it's uncomfortable.
My body felt sick, yeah.

A great deal. Because it affects your body.
It's a sense of pride.
A very nice smile if you have a body (that) is healthy.
Never had any toothache. Sorry, I am very forgetful.

Other participants were more specific in identifying oral health issues with their whole body:

(I get associated) neck pains.

Sore jaws.

I would probably be worried about decay and its foul smelling.

Some participants talked about the headaches that occurred as an outcome of their dental pain:

I get pain, general pain and headaches.

I get headaches. Yeah I feel like going to bed.

Mainly the headaches.
When my wisdom teeth came up and went down again;
I think I got migraines.

Oh yeah, I became not a very nice person.
Usually just my head when I do get a toothache;
I get head aches and jaw pains.

Other participants described the impact of their dental pain on their daily life:

It was really sore. I couldn't sleep.
I had to take lots of panadol, nurofen.

One participant described her daily routine for coping with toothache:

I have a temperature and a sore achy ear.
I just had to bear the pain.
Get my kids off to school – do breakfast and then when they go to school
I go back to bed till they come home and then I have to cook tea.

For a number of participants difficulty in eating was a consequence of their poor oral health, or being edentulous:

We avoided eating difficult foods, sweet corn.

Physically lost weight; slimmer as a result of not having teeth.
I carry on just the same really.
I don't let it bother me but try to eat foods.

The only impact on my body is I'm more aware of my oral health and the foods I eat.
I just take care of them better.
I know I have fillings and you can just about see through my teeth they are so thin.

Probably not being able to chew properly.

Yeah some food I can't eat, like fatty foods.
That's about being able to lose weight.
I get allergies to some food.

Are we talking physically?
Knowing my teeth are becoming fragile, I'm careful of foods to avoid breakage.

Basically I won't enjoy what you eat or drink.

I have trouble eating things.
Something like a sandwich, oh those grainy breads, a little grain gets in the wrong spot.
Sometimes eating anything can hit the wrong spot.
Pain. Stop enjoying food and socializing.

Sleep deprivation:

Lack of sleep. It was quite hard as; it kept on throbbing; spreads up the face.
Lack of sleep, tired the next day.
Lethargic, low motivation.

Mental health:

You can't think properly. It's sore.
Couldn't think properly. Couldn't eat properly.

Stress, children, grumpy.

Aaah, I don't like smiling.

Sore, ummm, then I get agitated and have to grind my teeth.

Yes again all my life I had a real complex growing up being teased
and kids being smart about my crooked teeth.
Being a gang member nobody ever gave me bother once I joined a gang.
I dealt with it in other ways.

Real sore; definitely; like I need do something about it.

A preference for social isolation:

It hurts so much. I want people to leave you alone.

Depressed. Yeah. Makes me not want to go out.

Like knowing I've got missing teeth and holes.
Others have their own teeth and they look normal.
I've put myself out of the picture.

Another participant described his coping mechanisms for with the continuous pain he was suffering:

It is like musical teeth – sore here – sore down there – sore on this side.
It just moves from one to the next.
Yes. Hard to sleep; can't get comfortable.
I had my head off the end of the couch and that feels better for a while.
I take nuramol and codeine painkillers, it helps me to get some sleep
until the pain returns usually before my son wakes in the morning.
I don't want to get used to these (painkillers) though; they lead to another issue.

Conclusion:

The impact of the status of their oral health upon their tinana elicited a variety of responses. For some participants it had a generalized impact upon their whole body, whilst for others the impact was confined to a specific region of the body such as the neck. A number of participants reported having associated headaches, difficulty with eating, sleep deprivation and the mind and mental function. Some participants described their method of coping with dental discomfort such as isolating themselves from their immediate social environment.

5.5.6 Oral health and te taha hinengaro

The participants in this study described their impact of their oral health concerns on their mental well-being or hinengaro in response to the following question:

Q11. What is the impact (if any) of your own oral health on your hinengaro?

The main impact was upon personal self-esteem and self-consciousness. Other impacts included feeling guilty about not looking after their teeth, distress, being grumpy, angry and having their daily routine disrupted. Having a dental problem caused some participants to reflect on their situation by thinking through their problem.

The impact of having healthy teeth was described as being very important:

Very much. Having good teeth makes you want to smile, communicate, interact.
Gives you pride. Makes you want to live life. Got a lot to do with appearance.

Self-esteem and self-consciousness:

Shy, not confident

I could honestly say if I had bad oral health,
that would affect my confidence a lot.
My confidence and self-esteem.
Something like the fear of looking aged or older.

Affects my self-esteem.
If, well I don't like meeting people;
when talking they're looking at you
and then that makes me feel judged in the wrong box.
Um, self-consciousness, um yeah it's sort of just sometimes
I get really shy and cover my face with my hand like this.

Not really good, really sorta sometimes I don't even wanna smile.

Self-conscious of bad breath and being too close to people.
Intimacy is a problem, therefore.
Makes you think negatively of yourself. Being unclean; it affects coping skills.

I've had difficulty studying.
Like when I'm preparing meals I just get sick of it and think, fuck it,
And it's the same with my study and the computer, I just go fuck it.
Yeah last week was one of those weeks.
I gave my kids to their mother; that was the first time and it wasn't due to my depression.
Self-conscious all my life. I stopped smiling when I got out of prison. I stopped smiling.

With my head now, how my head is, umm I'm not sure about.
I'm not happy about my smile. In a nutshell, that's it basically.

Yeah, yeah, hiding my nicotine and chipped tooth from people
and not wanting anyone seeing them.
Just brushing doesn't do enough

The more my gums bled I stopped smiling and laughing or anything.
The other thing is, I was buying tooth brushes too and they relieved the bleeding.
I've been through 20+ tooth brushes since giving up smoking 12 months.

Guilt complex:

Umm I know I should be looking after them better than what I am;
but I should be brushing more.
Aah just constantly looking at my teeth;
knowing my teeth are dirty and rotten, but dirty.

Distress:

Oh that…it becomes distressing; ruins your day.
Makes me more distressed with my depression.

Depressed. Stress. The false smile. Even when you talk not smiling.

Grumpy:

Alright, sometimes grumpy or down.

I say grumpy and sad. I can't really do anything about it.

Ugh I was grumpy.
I was alright but it was really sore at the back wisdom teeth.
I had to put up with pain for three years; the ongoing pain over that time.
Oh well you're grumpy; you're short; you don't function as well.

Disruption to daily routine:

Umm I think it just puts me out of focus in what I'm doing in my life today.
Disturbs me from what I'm doing.
It's really important to have good teeth today.
For your family as well.

Anger:

I think, "just piss off – just go away.
I want to go to the dentist, but then it goes away (the pain) so I don't go.

I think why the hell am I grinding my teeth? It feels good but it hurts.

Thinking about the problem:

I was thinking I should do something
about the sore tooth.

I was thinking I should get some panadol. Yeah.
I couldn't think about it. I had to block it out.
Um couldn't think.

Um just the pain and bearing with it.
Disrupts your thoughts. I carry on as normal.
I picture the food in my mouth when I swallow
and when it's going down; I picture it.

Conclusion:

There was an association between oral health and mental health and wellbeing. Having poor oral health or a dental problem preyed upon the participants minds such that it affected their self-esteem and they became very self-conscious. For other participants they couldn't bear thinking about it but the continuing pain was a constant reminder of their problem.

5.5.6 Oral health and te taha whānau

Q12. What is the impact (if any) of your own oral health on your whānau?

The impact of oral health, in particular poor oral health or a dental problem on the immediate social or family context of the participant was described in a variety of ways, Although some participants were isolated from their immediate whānau, other participants chose to isolate themselves from their whānau during times of suffering from dental pain. A positive response was that the participant received positive advice and support in order to overcome the dental problem. Other responses included the relationships with their children were affected and an impact upon the nature of their own family dynamics. The adjective "grumpy" was often used to express their relationship with family members.

However, one participant was very positive on the association between their own oral health and that of their whānau:

Whānau think I'm pretty cool with my teeth at my age.
I'm complimented with my teeth by my family, friends, associates how white my teeth are.
They want teeth like me. And they smoke too – not me.

The impact of an oral health problem had consequences for the immediate social environment for many of the participants. Some participants described being isolated from their immediate whānau:

Don't have much to do with my whānau.

I was away at Uni so I didn't think they knew,
but I know they would have said to go to the dentist.

Well I haven't seen my whānau in a while.
I still visit them, but maybe I should have spoken out;
I mean even with my dental problems,
I mean I know they support me.

However, other participants deliberately chose to isolate themselves from the whānau during times of suffering from dental pain:

Stay away from them. Try and sleep.

I pretty much slam myself in the room and feel angry with everyone.
But it's a pain I can deal with and not hurting anyone else.

No…I just handle it. I just…I don't….
I like my house to be mellow; you know just cruise.

Um, yep, um I don't want to go out to tea and dress up.
Sometimes my daughter don't attend things
It's okay at Te Matai 'cause they're all horis as well.

Whānau were able to provide advice and support:

They just said you better get some help.

(They were) just encouraging for me to get it checked and yeah, before it gets worse.
Ooh my nan arranged everything for me.
We went to Dental Plus to get my tooth pulled out.

My folks and mates all got their own teeth, really,
some healthy and some not so healthy.
They tell me to brush my teeth in the morning after breakfast.
My family will ask about my ability to eat something.
My sister asks about what happened to my teeth;
are you going to get dentures again?

My father thinks I've got great teeth.
I told him he needed to put his glasses on.
I like to feel confident to have good teeth,
for whānau, colleagues, friends.

The whānau – wonder why I am so quiet and holding my face.

Two participants described the financial support they received from whanau to cover the cost of their dental treatment or pain relief:

Well my mother had to pay for a tooth to be fixed; that was embarrassing.
Demoralising not being able to afford it myself.

Not much, not really. They helped to buy neurofen and drinks to help with the pain.
They bought stuff to help with the pain.

I had to go to the GP for codeine.

Relationship with children:

I won't get photos taken with the way my teeth look.
I'm looking forward to getting photos with my kids.
I wouldn't say as such but when I lean over to children
they can see the decay and discoloration;
they comment on, "Mum you're not brushing properly."
Setting a good example for the children.

Family dynamics:

My kids, umm, it's probably stressed them out too.

I'd say my husband would say I can't be around them.
It's too painful to talk.
Or even rip them out yourself, or try too.

To me it's a good example to kids on what not to do.

Yeah, yelling at my kids; being short tempered with them
and feeling like I'm not doing enough for them when they want to do things;
feeling guilty that I should be doing more with them.

Umm, oh my youngest son, then probably my second son bore the brunt of my pain;
yelling at the kids etc. I called in someone, maybe at the time it was dad to help with the kids.
I didn't cope.

Grumpy:

Probably have less patience, um being grumpy.
More tired and sore.

How do I treat you bad – I'm naughty, I'm bad. Grumpy, I take it out on them.

Oh yes I guess I'd annoy my family.
Makes me a bit grumpy.

Conclusion:

Te taha whanau, the family or social dimension was impacted upon by the oral health problems experienced by the participants. Some participants chose to physically isolate themselves from other whanau members during bouts of toothache, while in other cases there was an impact with the participants own children or within the social dynamics of the whanau. On the positive side whanau were able to provide advice and support and to pay for the cost of much needed dental treatment.

5.5.7 Oral health and te taha wairua

Q13. What is the impact (if any) of your own oral health on your wairua?

Only half of the participants in this study responded to this question about te taha wairua and their oral health. However, two participants expressed their view of suffering from toothache and their spiritual wellbeing in these terms:

It has really dampened my spirits,
but I'm not letting it affect my wairua right now
but if I don't get my teeth done,
I know it will affect my wairua.

Ohh heaps. Really heaps. It is really is for my wairua.
It makes a huge difference to your whole well-being.
Toothache is like an illness, like my bipolar.

Those participants who expressed their thoughts about te taha wairua acknowledged the spiritual world:

I just… the whole wairua thing.
I try not to get too much imbalance in life.
It's not good to have imbalance.

Everything. All tied up in (wairua) that is god. Wholesome is the word.

My spirit was painful, yeah, pain.

I think the impact on my wairua is lining up with my spiritual ideal.

Preoccupies my inner thoughts and peace of mind.
My ability to heal other people and my ability to use rongoa.
Things I was spiritually capable of when I was younger – late teens early twenties,
am no longer able. (I) used to have a better 'aura'.

I'm pretty spiritual. I believe in a god of my own understanding.
I believe in a higher power to get me through this.
It affects everything; it makes me withdraw inwards.
More self-obsessed; just down, just down.
Depression is my thing. It gets dark, really dark.

Those participants who expressed their thoughts on this aspect of their lives couched the response, in the main, within a celestial world of god.

Oh yeah, many a times, if there's a God out there,
give me strength to bear this pain and look after my tamariki.
And when we have visitors and my house is upside down I think,
"Too bad, you didn't come to see my house, you came to see me."

Um I believe that god gave us this body to look after.
Our teeth, we only get two sets in our life.

I believe that we have to look after one to have the other good.

Sometimes I think, "Oh my God, why am I here?"
I feed off it, it's bizarre.
I have so many things going on in my life that this is a good sore, not a bad sore.

I do believe in God; that spirits are in the bible.
I don't go to church. Spirits are in the words.
I would like to get false teeth though.

Conclusion:

Half the participants expressed a viewpoint on the impact of te taha wairua, the spiritual dimension and their oral health. It was in the main an acknowledgement of the spiritual world and that the spirits can be called upon in times of stress, such as going to the dentist or having toothache.

5.5.8 Oral health behaviours

Q14. Does everyone in your household have a toothbrush?

All participants reported that everyone in their household had a toothbrush.

Everyone has dental stuff.

We all have toothbrushes;
we all have our own toothbrushes and I have an electric toothbrush.

However two participants reported that whilst the other members of their household have tooth brushes, they themselves either didn't have one or they didn't use it:

I have a tooth brush, but I don't brush my teeth.

I don't have one; everyone else does.
I just think it's a waste of time.

Q15. How often do you brush your teeth?

The participants were asked how often they brushed their teeth. Most reported that they brushed their teeth twice a day, and one stated that the brushed, ""usually about 3 or 4 times a day."

Twice a day. I try. Definitely once a day.

At least twice a day, morning and night.

Okay be honest, once a day. That's pretty bad aye?
Actually sometimes two times a day after each smoke I have.
Good in the morning, but only at night when I remember;

but I'm good in the morning.

Ah oh morning and night.
Whenever I can as often as I can.

However, there were variations about tooth brushing from "Hardly ever. Just before I go to see a dentist," to "Most days," to "Umm, once a week. I'm terrible. I wasn't always like that." With a number of participants, tooth brushing was not always a daily routine:

I brush sometimes twice a day; sometimes once a day.
Sometimes you get lost in the middle of everything and if you forget, I know it's not good.
Sometimes I can go for about three days if I have got things on my mind.
Haha not as often as, I do. Not every day. I don't know why I don't.

One participant was very exact about their tooth brushing regime:

They get 3 times a week, Monday Wednesday, Friday after breakfast.

Three participants reported that they only brushed their teeth when dental concerns arose:

I use it once or um everytime I get a sore (tooth).

Uhh morning and night but when bleeding more often since giving up smoking.

Well when I feel they're dirty or when my mouth feels dirty I'll get to the bathroom and brush them.

5.5.9 Oral health and diet.

The participants in this study were asked about their knowledge of oral health and diet.

Q16. Does what you eat have an effect on the health of your own teeth?
Can you tell me about that?

I say a lot of what we eat affects our teeth.
They say healthy food should be good for you but what is really in food?
So I will question that.

Yeah, I believe so. I mean the only one I knew about was calcium for my teeth like milk. One of my first jobs as a milk boy, I used to drink all the milk and I don't know if it helps, but I've never had a broken bone.

The participants expressed their knowledge that sugar in the diet was a cause of dental decay:

Yep, heaps. Fatty foods, biscuits, lollies, chocolate, fizzy – just mainly sugary foods.

If you like eating lollies that will have an effect on your teeth and fizzy drinks too.

Well I noticed that if you eat lots of lollies and they break your fillings, I noticed when you eat lollies you break your fillings.

Yes I think it does.
Um lollies, chocolates.
Makes my teeth go through symptoms, pain symptoms, sore symptoms.

Some participants expressed their sweet tooth choices:

I've got a real thing for fizzy drinks.
I know I should be drinking water but it doesn't taste the same.
They are so cheap; cheaper than water.

I don't eat more lollies, but I eat my nan's cakes all the time and puddings.

Due to medications I crave sweets and fast foods all the time.
I eat what I think is good for me.
Craving cakes and lollies all the time.

Yeah, I'd say that I eat too much sweet stuff.
I think my eating habits are a bit of a flow on from my emotional state.
When I'm not feeling great about myself my first instinct is to eat food that tastes nice and makes me feel nice at the time.

A number of participants were careful to maintain a healthy food diet and to limit sweet food items in their diet for themselves and their whānau:

I have healthy food so it doesn't affect (my teeth) I reckon.

Yeah I'd say so. If I eat sugar I go brush my teeth.
I don't like fizzy drinks or my kids drinking fizzy.
I'm quite vigilant about brushing.

I would hold them down and make them brush properly;
make sure they go to the dentist.

Whānau diet is very careful for my children.
Tend to stick to natural foods and water and milk over fizzy.
Nowadays I usually eat meat and veges.
I used to love lollies and sugar.

I've cut down on my junk food; try and lose weight.
Try and cut down on chocolate.

What I eat again it's all tied in with recovery.
I was in self destruction mode.
It's all about how you feel.
I choose not to eat crap any more.

Myself I've never been too big on lollies and that.
When I was younger I used to eat a lot of junk
I definitely believe we are what we eat.

Not being able to eat properly:

I haven't eaten properly in 9 years.
I eat what I can; Weetbix, peanut butter and jam on toast dipped in kupu ti.
Mince it's easy. My boy hates mince because we have it too often.
Custard yoghurt, bananas.
I push food against the roof of my mouth and hold it there.

I eat not so much junk food because I can't eat properly obviously because of my teeth.
The foods that I can eat are soups and yoghurts. Not so much noodles.

One participant described their reality of daily living and diet in this way:

Yes I've got to eat sometimes so (otherwise) I have no energy.
Sometimes I eat a guy at work's apple core.
Sometimes there's a food parcel – that's bliss.
Other times I'm scrounging.

5.5.10 The benefits of fluoridation

The participants were asked about their knowledge of fluoridation.

Q17. Do you know about the benefits of fluoride for having healthy teeth? Can you tell me about that?

Less than half the participants were familiar with fluoridation and the beneficial effect upon the dentition. Those who were familiar with fluoridation had learnt about if from television: "I remember seeing it; it's been on TV."

Yes. On TV the ads. It's in the toothpaste.
Yip and it makes your teeth nice and strong
and the extra chewing gum to make more saliva
you produce its better for our teeth.

It was understood by some participants that fluoride in the water "protected the enamel of the teeth."

I have fluoride toothpaste and am aware fluoride is in the water?

Don't they stop the enamel from being penetrated?
They stop the plaque or acid from getting into your teeth.
It stops them becoming rotten.
That's why they put it in the water.

Fluoride is a chemical they put in the water system that help people in their dental care and I believe that it works.
They have it in the toothpaste as well.
I have fluoride toothpaste and am aware fluoride is in the water.

Only two participants held negative viewpoints on the benefits of fluoridation:

Isn't it a poison they put in the water?
It's supposed to be good for your teeth I don't know.

I disagree with fluoride in water.

5.5.11 Preferred treatment options

The participants were asked if they had a bad toothache in a back tooth, would they prefer to have it taken out or filled.

Q18. If you had a bad toothache in a back tooth, would you prefer to get it taken out or filled?

Half the participants in this study would rather have a posterior tooth extracted if it was the cause of a toothache:

Would like it take out. So that it doesn't ever happen again.

Taken out. I can't stand toothache at all.

The other half of the participants in this study would rather have a posterior tooth restored:

I'd rather get it filled. I think you should always get them filled even if it costs more; it's much better to keep your teeth; getting them pulled should be a last resort.

Some participants stated that the decision to either keep the tooth or to have it extracted would be made after a consultation with the dentist:

If there was a cure for it the dentist will be able to fix it. He will tell you what the options are and you can get it done.

I would just wait until the pain had gone. I would probably research, get a second opinion.

The participants were asked if they had a bad toothache in a front tooth, would they prefer to get it taken out or filled.

Q19. If you had a bad toothache in a front tooth, would you prefer to get it taken out or filled?

Over three-quarters of the participants in this study would rather have a n anterior tooth restored rather than extracted because of a dental pathology.

I would have it filled up. All my teeth are valuable. I think I need to keep them.

Yeah, I'd rather have it filled. I'd rather have healthy teeth forever.

Yes, oh just because it's the first thing you see when you're talking to people.

You can have it fixed; the dentist knows all the cures for that; he can save it.

One participant commented:

We take it out (the tooth) because that is the trend in the whanau.

APPENDIX 2: Second Oral Health (Post-Dental Treatment) Interview: Qualitative Data

Following the completion of dental treatment a second dental health interview was undertaken. This was a shorter interview with only 6 questions.
Overall, the participants reported exceptionally positive outcomes for themselves and their whānau. In not one instance were the words “pain” or “toothache” expressed.

Q1 What is the impact (if any) of your restored oral health on your tinana?

Overall the participants were exceptionally positive about the dental treatment they had received to restore their dentition. The positive changes that had come about following their dental treatment included feeling good, smiling, not hiding their mouth or teeth when talking and being confident, especially when the bad breath had been eliminated. Common words expressed to describe the impact of having a restored dentition on their taha tinana were, “awesome,” “glad,” “happy,” and “good”:

It’s been awesome.
A lot of positive changes
and it does a lot for your self-esteem as well.

Just awesome, just awesome.
Confident. So welcoming. Very good.

Some participants were happy in themselves with the outcome:

I’m a lot happier and talking a lot more,
and happy when it (the dental treatment) was over.

I’m a lot happier I know that.
Definitely a lot happier.
More social, talking more. I’ve had a lot of trips.

Some participants stated that they felt not only happy about having a restored dentition but also “felt good” and smiled more:

Good, happier, just feel good you know and happier

I feel good. I look good.
I smile a lot more.

Whilst other participants were happy with the treatment they had received:

I’m happy with what they did.

Really glad it's all done. Just had them cleaned.
I'm really pleased, more glad that it's done.
Really glad to have talked to these people.

The before and after impact of a restored dentition was noted by two participants:

Yeah I reckon there would be a great difference with them
being the way they were before they fixed them,
yeah it's been good and they feel much better now.

I don't cover my mouth anymore when I talk
like I did when I came to the first appointment.

Being able to have a functional dentition when eating was appreciated:

Yes it has.
I've started to eat properly over the last week
as I'm finally getting used to the dentures.

Ever since I had the extraction of that main tooth
now I can eat properly. It's made such a huge difference.

Yeah, awesome. I don't look past pies and steak anymore.
I had a burger today.
My mate couldn't get over that I was so surprised when I bit the tomato and it didn't drag out
of the burger like I usually do. It's awesome.
That's what always happened in the past.
I can't believe how great it is I don't even feel the depression.

I don't have to mush up my food anymore.
My kids would always give me heaps when I did.
It really hurt me and they didn't realize that it hurt me when they did that.
They are happy to see me not mushing my food anymore.

What a difference to have the tooth ripped out.
No headaches.
I can eat both sides and I put on 10KGs

So much different, I can eat real food now.

The oral health outcome after periodontal treatment was also noted:

Um. Definitely contributes to my physical health.
Nothing worse than having bad breath, thinking you have bad breath.
I like to smile and want to have a nice smile.

Smiles, no bad breath.

I'm not as concerned about my breath now that I know my teeth are clean.

Q2 What is the impact (if any) of your restored oral health on your hinengaro?

Most participants in this study reported that they felt there was an impact upon te taha hinengaro, their mental or emotional well-being as having a restored dentition made them "feel good" and restored their confidence in themselves:

Yep, it makes you feel good about yourself
and you're not always covering your mouth.

Feeling really good now.
I believe it's all about the whole person,
routines, nutrition, wellbeing, everything.

Good can feel the wellness in my thoughts.

It's really just changed my feelings about everything.
They only found decay under a filling so that was good.
The cleaning of my teeth was really great.
I felt better about it, boosted my confidence.

I am still getting used to the idea I have got teeth.
I go out and forget I've got new teeth.
Everyone says I look nice and younger.

One participant stated that having a restored dentition gave them the confidence to enrol and undertake an (educational or training) course:

Oh it's definitely changed things like we were just talking about that;
It's been an accumulation of things I definitely have a lot more confidence.
I applied for a course which I've always thought about over the years
but would never have done before.
Just to do that is a big change.

One participant mentioned the impact of having a restored dentition on their speech:

I just think it's better for my speech.
Before when they were pakaru I had to put up with that,
now they're all fixed, my speech is much better
which I didn't have when they were pakaru.

However one participant who was appreciative of the dental care they received was also mindful of their own mental health:

Um. Oh definitely. I'm going through depression at present.
Not too bad today but if you've got a lot of depression,
excessive thinking and bad thoughts and
bad oral health contributes to the depression.
My head is like a cement mixer.
But I take one moment at a time now.

Q3 What is the impact (if any) of your restored oral health on your whānau?

For many participants in this study the impact of having a restored dentition was felt within their immediate whānau as it was noticed and commented upon:

I guess the kids, they noticed.
Whānau came over and it was a bit hard having people come in
and they complimented me on the dentures

My whānau are happy when my health is good. I'm so happy.

My brother commented "I notice you smiling a lot more."
Other family members have noticed the difference for the better.
Some were asking how have you got your teeth so white?
I explained I have had some dental treatment lately.

Two participants commented on the renewed relationship and engagement with their own children:

My whānau spoil me.
My kids are happier to be with me.
They walk with me instead of behind me.

I am much stronger.
I can cope more with the kids.
They are 21 and 23 years old.

The importance of maintaining good oral health was an outcome for the whole whānau:

We've actually put together a routine for my girl to brush her teeth every day.
I don't want her to go through what I did.
I wouldn't have bothered before I would just do it (brush) whenever.
It's very important now.
All good, my whānau now looking at their own dental care.

It's good that now we all understand about the dental care.

Yep, now hey wanna do it, they wanna jump on board with this dental plan.

Yes my son asked if he can join the program.
That's what a lot of whānau would use it if it was available.
After completion of my dental treatment, that's what they were asking.

Whānau members provided positive reinforcement and support:

Yes it has, yep.
They said to me they're happy I've had them (my teeth) done.
Positive feedback.

It's all good.
My sister had treatment so as a whānau we can learn off each other.

One participant mentioned that there was an expectation from their whānau about having had a dental rehabilitation:

They are all waiting to see.
I guess I've been telling them "I'm getting my teeth but they haven't seen them yet."
All looking forward to that moment.

Two participants in this study noted that for them their whānau were not part of their dental rehabilitation:

Ah not really for my whānau but I just did it myself; I did it on my own.

Haven't actually seen my family.
They were taken away by police and I haven't seen them.
So the stress of that is still very hard to deal with.

Q4 What is the impact (if any) of your restored oral health on your wairua?

A common sentiment expressed by the participants taking part in this study was that there was a feeling that their "wairua had been restored" as well after having had a complete dental rehabilitation.
It is noted that "wairua" can mean many different things for different people. In this study it was generally accepted that "wairua" has connotations of spirituality which may encompass faith and religion as well as Māori cosmology and Atua or Gods of Te Ao Māori (the Māori world).

Good wairua. The impact goes through my whole wairua.
It restored my spirit to have my teeth restored.

Yes, it's restored my spirit.

My spiritual being has been lifted.

It has given me a big lift.

Spiritually I feel good in myself.
Yep I think so, even before I had my teeth done
my strength was in there, my wairua is good now.

I'm just very grateful to have this done.
I know I answer to a greater power above so I leave it to that.
I follow the path. I just try and do the next right thing.

It's a good feeling you know.
I keep looking in the mirror.

A small number of participants were reluctant to comment on this question as their own mental health status at the time of the interview over-rode anything else:

In the old days I might have thought about it
but personally I have too much stress to consider that at this time.
I hear what you're saying and I know what you mean.
I don't know at the moment.
I'm kind of going through a lot of things
and I don't know if it's something else or the teeth,
I'm not too sure yet.
I can't say I'm wary of all the gods, but yeah I just know what they are.

Yeah, it's finding the right words more how can I say it.
For me it's difficult to know the right words.
So strengthening the whole person.
The dental care has definitely made a huge difference,
given me more drive to cope with things.

Q5 Do you think it is important now to maintain regular dental care and check-ups?

The participants in this study were asked following their dental care if it was important for them to maintain regular dental care. All participants responded positively to this question.

Yeah if I keep my teeth clean I'll go and if they get dirty I'll go back for a check-up.

Yes definitely, especially at my age.

Yes. They advised me what to do. I need regular dental care.

Absolutely. I am all for that now.
Yeah, I think it will be important, I do now.
I think I brush about 4 times a day.
Yes I think it's really important to go regular and maintain dental care.

Yeah, well my teeth have been bleeding, my mate said to get it sorted.
I think it's really important.
I just gave up smoking 8 months ago. Clean 4 years.

One participant described his newly instituted oral health care routine after completing his dental rehabilitation:

Well I don't know about the check-ups but definitely the brushing is now regular.
I bought floss and mouthwash following the advice given to me.
I brush and floss or just swirl.

No bleeding gums anymore which was a worry before.
They told me I had bad gum disease so I hope I can look after them from now on.
I thought they hadn't cleaned them properly as I could feel heaps of ridges
at the back of my teeth.
I learned this meant they were actually clean.

Q6 Final thoughts and comments of the participants

The participants in this study were asked to make any comments about the research project that they had just participated in. The majority of participants were very complimentary about the project and were particularly grateful and appreciative of having their dentition restored, especially as it was undertaken at no cost to the participant.

Thank you so much for the opportunity.

Yes it's been awesome.
It opened my eyes up to the importance of caring for yourself.
It's changed my perspective on the dentists.

Just thank yous for your help.
I never would have done it really without being told about the project.

I think it was brilliant.
It was a good project and I bet a lot of people had joy out of it.
If I wasn't offered the programme I would still have it.

I was one of the lucky ones.
There are many others that need educating in oral health.
Thanks to all concerned.

My teeth are not as sensitive, I eat better now.
I'm glad I got it done.
I'm grateful for the project.
It was just fabulous.
I appreciate the whole research programme.
You meet different people.

The fact that the dental rehabilitation undertaken in this study was at no cost to the participant was commented upon:

In the old days people paid hundreds of dollars to get their teeth fixed.
I'm just really glad that I got it for free.

I am so grateful for the service at no cost.
You know, x-rays, checks, clean and fillings done.
Awesome.
You come away with free samples of mouthwash, toothpaste. Great!
I was happy with the process.
To be honest if it wasn't free, I wouldn't have gone through it.

Going to the dentist is not free like this (project) has been.
These sorts of things should be free to everyone
not just for the regular checkups but the major work that people need done,
but can't afford to do.

Some participants commented upon the dental clinicians who undertook their dental care including two participants commented on the fact that there were also treated by final year dental students. Te Manu Toroa has a Memorandum of Understanding with the University of Otago in which final year dental students undergo a 5-week community placement hosted by Te Manu Toroa. The students are able to treat the patients under the clinical supervision of the dentist.

Hey look, I'm grateful for what I had done.
Being prodded by the students was a bit rough
but I just thought no, that's ok to have it for free.
Very respectful people involved through the whole process.
Thank you very much.
You do get a bit apprehensive when the students were working on you,
but the dentist said they were graduating in a few weeks, so that made me happy.
They worked to your comfort, your needs, made sure you were safe and accommodating.

Comments complimenting the clinicians and the research team members were made:

I recommend it. I met really nice people.
I was a sceptic at first but happy I went.
All of them were really nice people. I recommend that course.
It's good team out there good people.

Yes I looked forward to taking part in the programme.
Taking care of my teeth is my responsibility

Not forgetting the project coordinator:

Oh Yeah. There's the lady that runs around for everybody
to make sure they get to all their appointments!

However two participants made negative comments about their participation the project after having had dental treatment:

Yep. I've got some negative comments I'd like to say.
I reckon they just drilled holes in my teeth so I wouldn't have to have my teeth pulled out.
I reckon they just filled my head so that they couldn't pull my teeth out.

I was a bit disappointed because my last part of the dental treatment couldn't be finished.
The dentist did start but it kept hurting. She offered to do a root canal.
I had lots of injections but it still hurts.
That is my only disappointment.
The dentist was very lovely. She kept me calm. She was really good.

Two participants were able to discuss being a participant in this study and having their dentition restored and relating it directly to their mental health:

First of all it's been so great to help improve my depression.
I am very grateful for the opportunity I was given to participate.
If it hadn't been for this project I probably wouldn't have bothered.
My personal being and development has improved.
It has also played a part in my recovery from depression.
I really commend those involved to make it happen.

It has been really good.
Now the depression is back to basics life is really great.
Dietician, nutrition still doing these things as well.
I feel it's all part of the whole picture as a person.

Three participants mentioned such dental care projects that they had just been a part of should be continued:

There is not a lot of advertising for adult and older dental education and support
so I think it's been wonderful.
I wish there was more for older people around dental care and education.

What I would like to add, I hope that there will be funding from somewhere
to provide for people that can't afford it.
Where can we go for this service?

I want a Māori service to continue, for whānau especially.
Like the service that I was given by Te Manu Toroa and Te Akau,
I wish there was more and I recommend everyone apply for this.

I'd like it keep going for our people yeah,
like you know we might have a few things that need to be done.
I think it's a good thing it should be open for all our people.

APPENDIX 3: Health Of The Nation Outcome Scales (HoNos)

The Health of the Nations Outcomes Scale (HoNOS) is the first standard measures of assessment and recovery mandated by the Ministry of Health for collecting mental health outcome information in New Zealand for over half a decade. HoNOS (adult) is designed for adult service users between the age 18 and 65 years.

HoNOS is used by mental health services, which support recovery, monitor and measure changes in people's health, wellbeing and circumstances over time. Measuring outcomes for people using mental health and addiction services supports the best possible service delivery and understanding of how well services are doing. It focuses on functional outcomes with 12 major domains, which can be measure change over time and following a clinical intervention.

HoNOS is completed by trained clinicians and is easy, quick and validated by the Ministry of Health. HoNOS is a measure of mental health outcomes, can measure severity and impact. It is an acceptable and useful Clinician rated tool with satisfactory inter-rater reliability.

HoNOS (Adult) Scales 1 to 12
The HoNOS will be assessed prior to the dental intervention as part of the initial psychiatric assessment and after a minimum of two weeks post dental treatment as the main functional outcome measure.

1. Overactive, aggressive, disruptive or agitated behaviour
2. Non-accidental self-injury
3. Problem drinking or drug-taking
4. Cognitive problems
5. Physical illness or disability problems
6. Problems associated with hallucinations and delusions
7. Problems with depressed mood
8. Other mental and behavioural problems
9. Problems with relationships
10. Problems with activities of daily living
11. Problems with living conditions
12. Problems with occupations and activities

Each item is rated on a 5-point item of severity (0 to 4) as follows:

0. No problem
1. Minor problem requiring no formal action
2. Mild problem
3. Problem of moderate severity
4. Severe to very severe problem
9. Not known or not applicable

APPENDIX 4: The Second Mental Health Interview

Following the completion of dental treatment a second mental health interview was carried out, the HoNOS interview was repeated.

Another outcome measure that was considered was the "subject report" by the cases to a standardized question:

Q1 Since you have had your dental treatment do you think it has had any impact on your general health and wellbeing?

The dichotomous response was recorded (i.e. Yes/No) followed by recording their verbatim explanation which generated general themes of responses. Some examples include:

I smile more…..because they're white

I feel different, much happier.

Not conscious of my breath smelling.

Whānau notice I smile more.

Unfortunately only 11% of cases have returned for their follow up post-dental HoNOS, which was originally planned to be face-to-face. Multiple appointments had been made with a low attendance once the dental treatment was completed.

In addition there were delays in getting cases seen after their dental appointment, as many cases required more than one dental treatment, which further delayed referral back to the mental arm of the study.

The current HoNOS scales available have shown on all but one case a greater then five-point difference in functional scale. The early data indicates on the basis of the HoNOS scale that the post-dental treatment is associated with functional improvement. This does not translate to the dental treatment "causing" the improvement but there is a clear association and relationship.

It would be far to say that the most difficult aspect of this research has been getting the participants to return for their follow up HoNOS after their final dental treatment. Because of the time constraints of the study and likely underestimating the time require for multiple dental treatment and poor follow up of cases, it was decided to complete the post-dental HoNOS over the telephone.

APPENDIX 5: First Dental Health Questionnaire

Participant ID No ……

Draft interview guide one – before having any dental treatment

Oral health experience

Tamari

---

1. Do you remember going to the School Dental Clinic when you were a child at primary school? Can you tell me about that?

2. Did the School Dental Therapist/Nurse teach you about looking after your teeth?

Rangatahi

---

3. Do you remember going to the dentist when you were at high school?
Can you tell me about that?

Pakeke

---

4. After you left high school did you continue to have dental care as an adult?

5. If you did have regular dental care can you tell me about that?

6. If you did not have regular care as an adult, have you ever needed to go and see a dentist? Can you tell me about that?

If toothache is not mentioned previously, then ask:

7. Have you ever had toothache, or any other dental problems?
Can you tell me about that?

8. What did you do to get things fixed up for you?
Can you tell me about that?

Te Whare Tapa Whā

9. Have you heard about Te Whare Tapa Whā – our Maori view of health and well-being? Te taha tinana, Te taha hinengaro, Te taha whānau, Te taha wairua.
Explain if necessary

10. What is the impact (if any) of your own oral health on your tinana?

11. What is the impact (if any) of your own oral health on your hinengaro?

12. What is the impact (if any) of your own oral health on your whānau?

13. What is the impact (if any) of your own oral health on your wairua?

Oral health behaviours

14. Does everyone in your household have a toothbrush?

15. How often do you brush your teeth?

Oral health beliefs

They say “you are what you eat.”

16. Does what you eat have an effect on the health of your own teeth?
Can you tell me about that?

17. Do you know about the benefits of fluoride for having healthy teeth?
Can you tell me about that?

18. If you had a bad toothache in a back tooth, would you prefer to get it taken out or filled?

19. If you had a bad toothache in a front tooth, would you prefer to get it taken out or filled?

APPENDIX 6: Second Dental Health Questionnaire

Participant ID No ……

SECOND DENTAL INTERVIEW

Interview Guide – after completion of dental treatment

Now that you have completed your course of dental treatment do you feel that this has had a positive effect on your overall health and well-being?

Te Whare Tapa Whā

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1. What is the impact (if any) of your restored oral health on your tinana?

2. What is the impact (if any) of your restored oral health on your hinengaro?

3. What is the impact (if any) of your restored oral health on your whānau?

4. What is the impact (if any) of your restored oral health on your wairua?

5. Do you think it is important now to maintain regular dental care and check-ups?

6. Are there any comments you would like to add about your participation in this particular oral health programme?

APPENDIX 7: Oral Health Impacy Profile (OHIP-14)

Participant ID No ……

ORAL HEALTH IMPACT PROFILE QUESTIONNAIRE

OHIP-14: How often in the past 12 months…

1. …have you had trouble **pronouncing** any **words** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

2. …have you felt that your **sense of taste** has worsened because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

3. …have you had **painful aching** in your mouth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

4. …have you found it **uncomfortable to eat any foods** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

5. …have you been **self-conscious** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

6. …have you **felt tense** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

7. …has your **diet been unsatisfactory** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

8. …have you had to **interrupt meals** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

9. …have you found it **difficult to relax** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

10. …have you been a bit **embarrassed** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

11. …have you been **irritable with other people** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

12. …have you had **difficulty doing your usual jobs** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

13. …have you felt that life in general was **less satisfying** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never

14. …have you been totally **unable to function** because of problems with your teeth, mouth or false teeth?

[ ]1 very often [ ]2 fairly often [ ]3 occasionally [ ]4 hardly ever [ ]5 never