The feasibility of a nutrition screening tool to improve food habits of Pacific pre-schoolers: a co-designed study

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Abstract

Aim: To collaborate with stakeholders (Pacific Heartbeat and parents/care givers of Pacific pre-schoolers) in a co-designed feasibility study to assess the acceptability and use of the NutriSTEP nutrition screening tool to improve Pacific pre-schooler eating habits. The aim was to assess the appropriateness of the NutriSTEP questionnaire items with end-users', to discuss potential adaptations, scoring methods and recommendations for use of the NutriSTEP tool in the community.

Methods/Design: The co-design method involved extensive discussions with the Pacific Heartbeat stakeholder team to plan the engagement with end-user groups (Pacific communities). Five focus groups were undertaken across communities in Auckland (N=38 participants, mean age 38±10.9 years, 36 females, 2 male) who were parents/carers of Pacific children between the ages of 2-5 years old. Participants completed and provided feedback on the NutriSTEP tool in focus group discussions. Key findings were collated and presented in a final focus group with representatives from the previous round of focus group participants. Discussions enabled the approval of recommended changes for use of the NutriSTEP tool prior to community implementation.

Results: Half of the participants were born in New Zealand with the remaining half born in various Pacific countries, nine participants had a tertiary education while 15 participants preferred not to comment, and over half (58%) of the participants used a first language other than English. Focus group discussions revealed six main themes: 1) The NutriSTEP tool is exposing and eye opening and raised awareness of daily habits, highlighting areas for improvement. 2) The opportunity for parents/carers to self-score the tool to clearly identify nutrition risk level outcomes was preferred. 3) Several proposed wording changes were needed to improve the clarity of questionnaire items. 4) Food group items were ambiguous and needed inclusion of cultural foods in item examples (e.g. taro and cassava in vegetable group). 5) Items related to food habits created a sense of embarrassment and judgement and highlighted the importance of community screening in a supportive group environment. 6) Physical activity, weight and growth items needed reframing to encompass a cultural perspective.

Conclusions: The NutriSTEP tool was acceptable for the most part by the end-user groups. Amendments were needed for specified items to improve cultural acceptability and understanding. Groups sessions for completion of the tool was recommended for successful implementation in the Pacific community. The tool increased parent/carers awareness of nutrition related habits, and highlighted areas for improvement. The development of culturally appropriate resources to enable improved eating habits for Pacific pre-schoolers at all levels of health literacy was identified. Post tool completion resources will include material suggested in this co-designed study to increase knowledge around nutrition related topics.

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Abbreviations

Acronym	*Full Form*
BMI	Body Mass Index
B4SC	Before School Check
COPD	Chronic Obstructive Pulmonary Disease
CVD	Cardiovascular Disease
HbA1c	Hemoglobin A1c
ICC	Intraclass Correlation Coefficient
ID	Identification (Participant ID)
koha	Gift (in Māori)
MoPP	Ministry of Pacific Peoples
N	Number of participants
NVivo	A qualitative data analysis software (Lumivero, 2023)
NST	Nutrition Screening Tool
NutriSTEP	Nutrition Screening Tool for Every Pre-schooler
NZ	New Zealand
OM2	Massey University Human Ethics Committee Ohu Matatika 2
P	Probability (used in statistical contexts, e.g., $P < 0.01$)
PEDS	Parent Evaluation of Developmental Status
PNST	Paediatric Nutrition Screening Tool
PYMS	Paediatric Yorkhill Malnutrition Score
STRONGkids	Screening Tool for Risk of impaired Nutritional Status and Growth
UK	United Kingdom
WHO	World Health Organisation

Chapter 1: Introduction

Title: The feasibility of a nutrition screening tool to improve food habits of Pacific pre-schoolers: a co-designed study

1.1 Background

1.1.1 Poor dietary habits in early childhood in New Zealand

Dietary habits established in early childhood often persist into adolescence and adulthood (McKelvie-Sebileau et al., 2022), making early intervention crucial for promoting lifelong healthy eating habits (Gerritsen et al., 2018). This suggests, modifying such behaviours in later stages of life is notably challenging (Da Costa et al., 2019). Obesity is five times more likely to be experienced in adulthood among those who have experienced it in childhood and adolescence (McKelvie-Sebileau et al., 2022), as well as being associated with a higher risk of preventable nutrition related diseases, such as type 2 diabetes (T2DM), colon cancer and ischaemic heart disease (Daniels, 2009). The prevalence of childhood obesity in New Zealand is increasing, with New Zealand having the third highest rates of childhood obesity among the 40 Organization for Economic Co-operation and Development (OECD) countries (Forgeson, 2020). One in nine children (11%) are in the obese category between the ages of 2-14-years of age (Howe et al., 2015).

1.1.2 High prevalence among Pacific children

New Zealand is home to many Pacific peoples (442,632) which make up 8.9% of the total population (New Zealand Government, 2024). In 2000 the NZ Ministry of Health created the Pacific Health branch with the aim to improve the health of Pacific peoples in New Zealand (Wright & Hornblow, 2008), as their overall health status is poorer compared with European New Zealanders (Lilo et al., 2020; Sheridan et al., 2011; Wright & Hornblow, 2008).

Cardiovascular disease (CVD) is the leading cause of death among Pacific people and is a preventable cause of death. Pacific people are twice as likely to die of heart disease compared to non-Māori non-Pacific people (Minisrty for Pacific Peoples, 2020), with unhealthy diet and physical inactivity being major contributing risk factors (World Health Organisation, 2024).

There is a need to recognise the risk factors associated with poor food intake and dietary habits in pre-school aged children (Morton et al., 2017). Pacific children between the ages of 2 and 14 years of age have the highest prevalence of obesity (27.8 %), compared with Māori (21.7%), NZ European (8.6%) and Asian (7.9%) children and are 2.8 times more likely to have

fizzy drinks three or more times a week, 3.7 times more likely to eat fast food at least three times a week and 67.8% of Pacific children eat breakfast daily compared to Māori (69.9%), NZ European (80.7%) and Asian children (89.5%) (Ministry of Health, 2023).

In the New Zealand health survey, it was found that 4.9% of children were meeting their recommended fruit and vegetable intake in the 2-14-year-old range. When broken down into ethnic group percentages meeting fruit and vegetable recommendations , Pacific children had the lowest with 2.2% in comparison to Māori 5.7%, Asian 4.3% and European/other 5.4% (Ministry of Health, 2023).

Pre-school children's nutritional status can be determined by dietary, behavioural and environmental risk factors (Moreno et al., 2008). Such factors contribute to chronic diseases the Pacific community face in adulthood such as ischaemic heart disease, stroke and higher rates of diabetes than that of other ethnic groups in New Zealand (Howden-Chapman et al., 2000).

Early identification of pre-school children with poor nutrition habits may help to lower the risk of obesity and development of chronic diseases in adulthood (Ross et al., 2023) and therefore be beneficial in Pacific communities.

1.1.3 Nutrition Screening in early childhood

Nutrition screening is a simple and practical method of identifying nutritional risks in children and increasing awareness of parents around contributors to nutritional problems (Randall Simpson et al., 2008).

The Nutrition Screening Tool for Every Pre-schooler (NutriSTEP) is a community-based questionnaire provided to parents/caregivers to help determine nutritional risks. The questionnaire items administered are in relation to eating patterns and other factors that may contribute to a child's nutritional status (Haldimand-Norfolk, 2013) such as food intake from the different groups such as grains, fruit, vegetables, dairy, fish, meat, poultry, fluid intake and fast food. Other questions related to contributing factors of food intake such as eating environment, access to food, sedentary behaviour, physical activity and screen time are also included (Tran & Bellini, 2022).

Following validation of the NutriSTEP tool, it was found to support increased awareness in health care settings, parents and caregivers. NutriSTEP assists in the identification of nutrition problems and can be used to develop interventions, improving nutritional status in a community setting (Randall Simpson et al., 2008). The NutriSTEP tool which was validated in Canada has been adapted for use in preschool aged children in New Zealand and can be used in person and online (Wham et al., 2021).

The NZ adapted tool was administered to parents and caregivers in both high and low socio-economic pre-school areas. Parents who completed the tool also provided feedback to each of the questions. Completion of the adapted questionnaire, showed 10% of pre-schoolers had sedentary time exceeding 3 hours daily, a third (34%) were eating less than one serving of vegetables and a third (28%) of parents acknowledged that nutritious food was 'sometimes' expensive which restricted these foods because of the cost. (Wham et al., 2021). In this study most parents were in their early to mid-30s, had a tertiary education, used English as a first language and identified as New Zealand European (Wham et al., 2021).

1.1.4 Partnership with Pacific Heartbeat

The need for community involvement and cultural awareness is important in this study as Pacific peoples view health as holistic and inextricably intertwined with the wellbeing of families and communities. Pacific languages and culture provide a strong foundation of well-being and sense of belonging which helps to facilitate healthy relationships within families and communities (Ministry of Pacific Peoples, 2018a).

Pacific health models suggest there is an identifiable way of working with Pacific peoples to improve Pacific health, which needs stronger implementation in health care settings. As outlined in the Fonofale model, parents of Pacific children consider all aspects of their child's life to interpret their health such as family and community connections (Ihara & Vakalahi, 2012).

Hence, using a co-design method and forming a partnership Pacific Heartbeat. The Pacific Heartbeat team is a branch of the Heart Foundation dedicated to improving the heart health of New Zealand's Pacific Island population. This includes understanding the heart, eating well, being smoke free and being more active. Pacific Heartbeat offer a range of courses and resources to support Pacific communities, and people who work with Pacific peoples, to increase skills and knowledge around food and health.

With relationships Pacific Heartbeat have within the Pacific community the study may have a further reach. There is an opportunity to work together to roll out the NutriSTEP tool to enhance Pacific pre-school nutrition and health outcomes in the future.

Hearing the voices of participants (stakeholders) who the research/study effects will give researchers a better understanding on how to go forward with interventions to improve health and close the gap of what is thought to help and what end users are wanting to help improve their health.

1.1.5 Collaborative and Co-operative design

The co-design is a collaborative and co-operative design to work together to generate ideas and solutions for a common problem or interest (Zamenopoulos & Alexiou, 2018). Use of a co-design is more effective as it closes the gap between what end users are wanting and what the research is suggesting end users need (Slattery et al., 2020). It opens up a safe space for better understanding of identifying participants needs, analysing problems together and to collectively generate solutions for problems identified (Ledwith & Springett, 2010).

In a church based participatory design the intervention on 89 Samoans in a church community showed clear benefits in Australian Samoans with Type 2 diabetes such as better cardiovascular outcomes and improved quality of life (Ndwiga et al., 2020).

The major strengths of the study were actively engaging the community. Working with the community and asking how they would like the NutriSTEP tool to be administered. Then finding what the common barriers to healthy nutrition are, to therefore help create a community intervention (Ndwiga et al., 2020).

Working alongside the Pacific community to determine how the NutriSTEP tool should be administered and what areas of nutrition need intervention, will create a bespoke way to improve health. This design has been selected to embrace and empower Pacific communities to improve nutrition and health (Eruera, 2010).

1.2 Purpose of the study

It is clear that there is a need for further research for Pacific pre-school aged children to help tackle barriers to improving eating habits and therefore long-term health outcomes. This study aims to work specifically with parents of Pacific pre-school aged children, to improve the ease and use of the NutriSTEP tool for parents within the Pacific community and from this find barriers to positive nutrition in children. Once barriers have been identified, working with participants and Pacific Heartbeat to collectively determine the best interventions for improving eating habits and health outcomes for Pacific children.

1.3 Aim

To assess the acceptability of nutrition screening and intervention initiatives to improve Pacific pre-schooler eating habits in a co-designed feasibility study and participatory engagement with both our stakeholder (Pacific Heartbeat team) and end-user groups (parents and carers of Pacific children)

1.4 Objectives

- collaborate with stakeholders (Pacific heartbeat) and end-users (Pacific communities) in a co-design process with extensive discussions to plan the engagement and procedures;
- assess the acceptability and use of the NutriSTEP tool
- conduct five end-user focus groups (participants from different Pacific communities), by completing and providing feedback on the NutriSTEP tool;
- Approve and determine adaptations, access and initiatives for use of NutriSTEP;
- make recommendations for initiatives to improve Pacific pre-schooler eating habits.

1.5 Thesis Structure

The study has been assembled into four chapters. Chapter One introduces the background and purpose of the study and includes the aim, objectives and researcher's contributions. Chapter Two is a review of the literature of Pacific view on health, health of Pacific children, childhood eating habits, use of nutrition screening tools and working as a co-design study. Chapter Three is the research manuscript which includes the abstract, introduction, methods, results, and discussion of findings. Finally, Chapter Four concludes the research and states whether the aim and objectives have been met as well as the study's strengths, limitations, and future research recommendations. The appendices include the recruitment poster, participant information sheet and consent form, moderator guide and amended NutriSTEP tool.

1.6 Researcher Contributions

Table 1.1 Summary of researcher's contributions to Community Nutrition Intervention to improve Food Intake of Pacific Pre-schoolers

Researchers	Contributions and Support
Aimee Ngawhika	Main author and researcher of this thesis, preparation of ethics application, co-created all visual materials for research, co-created all information sheets and consent forms for research, facilitated focus groups, distributed all emails and online questionnaire links, transcription entry into NVivo, analysed transcriptions in NVivo, interpretation of results.
Prof Carol Wham Supervisor	Academic supervisor who developed the study design. Advised about data analysis. Revised and approved the thesis chapters and manuscript.

Prof Rozanne Kruger Supervisor	Academic supervisor who developed the study design. Advised about data analysis. Revised and approved the thesis chapters and manuscript.
Imogen Nelson Research assistant	General project administration, budget management, focus group organisation, facilitation and catering, focus group recording transcription
Alexandria Nicholas Pacific Heartbeat	Linking with community groups, guidance in working with Pacific communities

Chapter 2: Literature review

2.1 The Pacific view of health

Pacific peoples view health as holistic and inextricably intertwined with the wellbeing of families and communities. Pacific languages and culture provide a strong foundation of well-being and sense of belonging, this helps facilitate healthy relationships within families and communities (Ministry of Pacific Peoples, 2018a).

Experts in Pacific health have created models to show how the concept of health and services should be framed. There are many models such as the Fonofale, Faafaletui, Kakala and Tivaevae (Suaalii-Sauni et al., 2009). All models show similarities in what make the 'wholeness' of a person. For example, the Fonofale model uses the fale (a house) to symbolise the wholeness of a person, the four pillars of the fale represent the spiritual, physical, mental and other parts of a Pacific person and the roof and the base of the fale represent the aspects of family and culture (Pulotu-Endemann et al., 2017; Robinson et al., 2006). This all plays a role in the health and wholeness of a person.

Pacific health models suggest there is an identifiable way of working with Pacific peoples to improve Pacific health which needs stronger implementation in health care settings. As outlined in the Fonofale model, parents of Pacific children consider all aspects of their child's life to interpret their health such as family and community connections and overall 'happiness' (spiritual health) (Ihara & Vakalahi, 2012). These factors may be more important than aspects of physical health such as body mass index. Parents may not be open to discussing their child's health to a 'stranger', if a comfortable relationship between themselves and the clinician has not been established. Pacific peoples are relationship-based people and need clinicians and healthcare workers that show understanding of their needs/life to establish trust. Without this trust there may be a block to be 'open' and tell the truth (Robinson et al., 2006; Sheridan et al., 2023). Previously it has been expressed that the western healthcare system is science based and neglects spirituality and emotions in the depth Pacific peoples view health (Esera, 2001).

Mismatches and clashes in cultural values during communication in the health system has been expressed (Lilo et al., 2020). Such as continued incorrect pronunciation of names by healthcare professionals after being corrected, feeling stereotyped and having private health issues discussed in front of others lacking privacy. Pacific families expressed there was a limit on the amount of support persons able to accompany a family member in healthcare situations and found more family members present were seen as an annoyance rather than support. Information would be provided in English and not translated into Pacific languages making it hard to understand. (Arlidge et al., 2009; Brown, 2018).

In face-to-face interviews participants found assessment health practices were ‘foreign concepts’ due to individuality of the assessments (Robinson et al., 2006). Rather than focusing on the individual and the health issue of concern, Pacific peoples view one’s health is intertwined with the wellbeing of family and community. Therefore assessment and strategies need to address the needs of the whole family and household (Ryan et al., 2019).

2.2 Health risk factors for Pacific Peoples

In 2000 the NZ Ministry of Health created the Pacific Health branch with the aim to improve the health of Pacific peoples in New Zealand (Wright & Hornblow, 2008), as their overall health status is poorer compared with European New Zealanders (Lilo et al., 2020; Sheridan et al., 2011; Wright & Hornblow, 2008).

Pacific people (along with Māori) are disadvantaged in comparison to other populations in New Zealand (Lilo et al., 2020). Disparities between Pacific peoples and the rest of the population are apparent since Pacific people are less likely to receive equal health care due to socioeconomic factors (living in deprived areas), healthcare costs (not having the means to pay for appointments) , racism (continued mispronunciation of names), discrimination (reluctance to refer to specialist), health literacy (difficulties in reading/understanding medical jargon) and culture in comparison to non-Pacific/non-Māori (Ellison-Loschmann & Pearce, 2006).

Cardiovascular disease (CVD) is the leading cause of death among Pacific people and is an preventable cause of death, with Pacific people being twice as likely to die of a heart disease compared to non-Māori non-Pacific people (Minisrty for Pacific Peoples, 2020) with unhealthy diet and physical inactivity being some of the contributing risk factors to this disease (World Health Organisation, 2024).

Obesity is a chronic disease associated with co-morbidities (Armstrong et al., 2012) as diabetes, chronic obstructive pulmonary disease (COPD), CVD and metabolic syndrome co-morbidities that were seen in adults are now being seen in children. In an American review that examined the knowledge around impact of childhood obesity on the different organ systems. Findings showed almost every organ in the body is adversely affected as a result of childhood obesity (Daniels, 2009).

Furthermore, obesity, in addition to diet, sedentary lifestyle and genetics, may lead to insulin resistance and in turn the development of Type 2 diabetes (T2DM) (Wu et al., 2014). The prevalence of T2DM is increasing in children and adolescents, as well as the use of metformin and insulin to manage it (Kao & Sabin, 2016). New Zealand Pacific peoples are 2.5 times more likely to develop T2DM and at a younger age then non-Pacific people (Schmidt-Busby et al., 2019).

The Ministry of Pacific peoples created a report exploring official statistics used in New Zealand to present the health status of Pacific people. Findings showed 79% of the Pacific population are living in a home they do not own and 27% participate in tertiary education, which contributes to the wellbeing of Pacific peoples (Minisrty for Pacific Peoples, 2020) .

In the 2022/23 New Zealand Health Survey, Pacific parents reported children were 2.7 times more likely to have an unmet need for a GP visit due to cost and dislike or fearing of a GP. In contrast to non-Pacific children and Pacific children had the lowest prevalence to visit a GP (59.9%) compared to Māori (63%), Asian (63.2%) and European (64.5%) children, (Ministry of Health, 2023).

In a New Zealand review study, Pacific families expressed having a different level of care to those of other ethnic groups, having unfamiliar language used and resources provided in English making it hard to comprehend the health information received (Lilo et al., 2020). In a qualitative study members of the Pacific communities in New Zealand and Hawaii, felt distrust with healthcare professionals feeling there is bias and prejudice when going to appointments, this left community members feeling unwelcomed and discouraged from seeking care that is needed and deserved (Sumibcay, 2024). These negative experiences in health care can have long lasting consequences (Lilo et al., 2020).

Following on from negative healthcare experiences, around 90% of Pacific women and men (over 15 years old) had low health literacy. This has led to lower rates of managing poor health, interpreting nutrition related information and seeking health care assistance (Sheridan et al., 2023). Patients with low health literacy have a high rate of feeling shame and will hide the fact they have difficulties in mathematics, reading, writing and understanding information to avoid embarrassment (Beale, 2017). Pacific peoples are more likely to report worse chronic conditions such as diabetes with Pacific people being three times more likely to have diabetes than non-Pacific people (Sheridan et al., 2011).

In New Zealand the health gap between Pacific and non-Pacific peoples is very apparent, with a high prevalence of chronic disease earlier in life leading to lower life expectancy (Sheridan et al., 2023). Deaths considered preventable are twice as high in Pacific (47.3%) compared to non-Māori non-Pacific populations (23.2%) (Walsh & Grey, 2019). However, Despite attempts to create interventions for improving the health of Pacific people it was earlier recognised that health policies were not sufficient to address Pacific specific health issues (Wright & Hornblow, 2008)

2.3 The health of Pacific pre-schoolers

Good nutrition is essential to enhance development, growth, nutritional status and health (Dewey, 2003; Koch et al., 2006; Morgan et al., 2010) especially during Childhood which is a crucial time to develop eating habits that track into adulthood. A healthy diet developed early

in childhood can lessen the possibility of having health problems in later years (Koch et al., 2006; Lautenschlager & Smith, 2007).

Pacific children between the ages of 2 and 14 years of age have the highest prevalence of obesity (27.8 %), compared with Māori (21.7%), NZ European (8.6%) and Asian (7.9%) children and are 2.8 times more likely to have fizzy drinks three or more times a week, 3.7 times more likely to eat fast food at least three times a week and 67.8% of Pacific children eat breakfast daily compared to Māori (69.9%), NZ European (80.7%) and Asian children (89.5%) (Ministry of Health, 2023).

The number one cause of poor health in New Zealand (NZ) is related to diet with obesity or high body mass index (BMI) being the second ranked risk factor (Ministry of Health, 2017a). Unhealthy diet patterns are usually developed in early childhood (Birch et al., 2007) and therefore addressing nutrition risk factors that may lead to obesity and other chronic diseases is essential during this time (WHO, 2024).

Pre-school children's nutritional status can be determined by dietary, behavioural and environmental risk factors. Dietary risk factors can include insufficient intake of nutritious food groups (fruit and vegetables; milk and milk products; breads and cereals; and seafood, lean meats, chicken legumes, eggs, nuts and seeds), sporadic eating and consuming either not enough or too much food (Moreno et al., 2008). Behavioural risk factors can include increased sedentary behaviour and insufficient physical activity (Anderson et al., 2017; Hills et al., 2007). Environmental risk factors may include parental food behaviours, food availability and accessibility and high deprivation areas (Gerritsen et al., 2018; Stoner et al., 2016).

2.4 Dietary habits of Pacific pre-schoolers

2.4.1 Food group intake

Literature on food group intake and dietary patterns for the specific age group of 2-5-year-olds (pre-school age) is very scarce internationally and within New Zealand, more research is needed. Guidelines for children suggest providing a variety of healthy foods for optimal growth. A mixture of foods from the main four food groups are recommended. The food groups are fruit and vegetables, breads and cereals, milk and milk products and lean meats, chicken, seafood, eggs, legumes, nuts and seeds (Ministry of Health, 2023). Limit takeaways and drink plenty of fluids. In General for the 2-12-year-olds we know that 70.9% are eating the recommended serving of fruit per day and 5.4% are eating the recommended amount of vegetables per day (Ministry of Health, 2023).

2.4.2 Breads and cereals / grains and grain products

Bread and cereals (grain and grain products) are an important source of energy for children when eating a variety these provide dietary fibre, protein and B vitamins (excluding B12) (Ministry of Health, 2012; H. P. A. Ministry of Health, 2017). It is recommended that pre-schoolers have at least 4 servings of cereals, rice and pasta a day. A study looking into the dietary patterns of pre-school children in New Zealand found that 93% of children did not eat the recommended amount of cereals and bread (at least 4 servings a day) (Theodore et al., 2006).

2.4.3 Milk and milk products

It is currently recommended that pre-school children 2-5-years of age have at least 2-3 servings of milk/milk products a day (Ministry of Health, 2012). Milk is a great source of energy and protein and provides vitamins and minerals such as B12, riboflavin, vitamin A, calcium, iodine, phosphorus and zinc. These are important to have in the diet to help build strong bones and teeth (Ministry of Health, 2012; H. P. A. Ministry of Health, 2017).

In a New Zealand (Dunedin) study made up of 30 children between the ages of three and ten, children who avoided milk were shorter ($P < 0.01$), had smaller skeletons ($P < 0.01$), lower total-body bone mineral content ($P < 0.01$) than children in the control group (Black et al., 2002). In an observational New Zealand study a small but significant finding showed 35.3% of children who avoided milk intake had a fracture history and had more fractures than there control pair this linked the lower calcium intake and bone development (Delshad et al., 2020). Following the Ministry of Health recommendations 85% of children were consuming milk on a daily basis (Theodore et al., 2006)

2.4.4 Fruit and vegetable intake

At least 2 servings of fruit and two servings of vegetables are recommended in variety (including kumara, potatoes and taro). Fruit and vegetables provide energy, carbohydrate, dietary fibre and an array of vitamins and minerals. Included are vitamin A and C, folate, potassium and magnesium. When eaten regularly and in high amounts they have been shown to reduce the risk of type 2 diabetes, cardiovascular disease and many cancers. Because of these beneficial protective compounds eating a wide range is best to gain optimal nutrient intake (Ministry of Health, 2012; H. P. A. Ministry of Health, 2017).

In a New Zealand health survey, it was found that 4.9% of children 2-14-years-old, were meeting their recommended fruit and vegetable intake. When broken down into ethnic percentages for meeting recommendations, Pacific had the lowest with 2.2% in comparison to Māori 5.7%, Asian 4.3% and European/other 5.4%. When it came to eating the

recommended amount of vegetables for the same age group Pacific children were the lowest with 2.5% meeting recommendations in comparison with Māori 5.8%, Asian 4.4% and European/other 6.1% (Ministry of Health, 2023). Using data from the Growing Up in New Zealand study 84% of pre-schoolers in the cohort were eating fruit and 60% were eating vegetables and in total 54% were eating at least two servings of fruit and vegetables, though there was no ethnic group breakdown in the findings (Morton et al., 2017).

2.4.5 Lean meats, chicken, seafood, eggs, legumes, nuts and seeds

This group of foods are a good source of protein, energy and fats they also provide vitamins and minerals (B12, niacin, thiamine, iron, zinc, selenium, magnesium, potassium, phosphorus). These are important in child growth as they have a role in producing and maintaining blood supply and brain development (Grantham-McGregor & Ani, 2001). It is recommended that pre-schoolers have at least 1-2 servings within this food group (Ministry of Health, 2012; H. P. A. Ministry of Health, 2017).

Literature for pre-school aged children in this area is lacking. Though it is known that inadequate meat intake can contribute to an increased risk of iron-deficiency anaemia. In Auckland a random sample study on children under two years of age found 14% of children were anaemic. The highest rates of anaemia were Pacific, Māori and non-European ethnic groups (Grant et al., 2007).

2.4.6 Fast food

The current recommendations for foods that are high in fat, sugar or salt are to have them occasionally (less than once a week) and not to be made everyday foods/drinks, where possible healthier choices should be made (Ministry of Health, 2012; H. P. A. Ministry of Health, 2017). The literature supports that high consumption of these foods may cause negative health outcomes that include obesity, high blood pressure and diabetes (Ministry of Health, 2012; Utter, Scragg, Schaaf, et al., 2007).

Findings of the New Zealand Health survey showed that Pacific children had the highest prevalence of eating fast food three or more times a week at 24%, Māori 13.1%, European/other 7.1% and Asian 4.8% (Ministry of Health, 2023). This indicates healthier foods in the diet are being displaced (Ministry of Health, 2012).

2.4.7 Meal frequency - Children choosing how much to eat

Snacking is associated with positive energy intake and may increase risk of overweight and obesity if snacks surpass children's daily energy requirements (Xue et al., 2019). The current guidelines suggest pre-school children have three main meals and two-three small snacks at

regular times throughout the day. It is advised that children do not continuously 'graze' during the day (Ministry of Health, 2012; H. P. A. Ministry of Health, 2017). Snacks are a significant source of energy for pre-schoolers and can help children meet nutrient requirements with smaller meals as they have smaller stomach capacity (Ministry of Health, 2012).

Eating breakfast can influence children snacking behaviours. In a cross-sectional study using the data from the National Children's Nutrition Survey findings showed children were less likely to meet recommendations for vegetable and fruit consumption (*P*=0.005), as well as having a higher prevalence of frequently consuming unhealthy snack foods when breakfast was missed. Skipping breakfast was also associated with a higher BMI (*P*=0.002) (Utter, Scragg, Mhurchu, et al., 2007). In the New Zealand Health Survey Pacific children had the lowest prevalence of eating breakfast everyday 67.8% in comparison to Māori 69.9%, Asian 89.5% and European/other 80.7% (Ministry of Health, 2023).

2.4.8 Parental influences

Children's eating behaviours, patterns and choices can be highly determined by parents and caregivers (Birch, 1980b; Scaglioni et al., 2008). Many studies agree parents can create an environment for children that will support the development of healthy eating habits or contribute to unhealthy disordered eating. (Birch et al., 2007; Harper & Sanders, 1975; Scaglioni et al., 2008). Parents provide the food choices available in the home setting, portion sizes served, guiding feeding practices and role model eating behaviours (Birch, 1980a; Birch et al., 2007; Shepherd & Dennison, 1996). In a report looking at parental influences on children's eating, children were more likely to eat an unfamiliar food when a parent was seen eating it, compared to having food offered by others. This is something to acknowledge when introducing unfamiliar fruit and vegetables to children (Harper & Sanders, 1975). On the other hand, children adopted inadequate dietary related habits when parents demonstrated poor dietary behaviours (Spurrier et al., 2008) .

Negative outcomes have been associated with feeding practices even when parent intentions are good. Such as picky eating and lower fruit and vegetable intake when pressured to eat foods "good for them" as well as overeating high energy nutrient dense foods when these are restricted (Fisher & Birch, 1996; Galloway et al., 2006). Examples include eating more takeaway foods since homemade meals were decreasing and "on the run" meals (fast-food/takeaways) have become more frequent (Jaworowska et al., 2013). In the Pacific Peoples Health report Pacific children (2-14 years) were more likely to consume three or more fizzy drinks and eaten fast-food at least three times in the last week compared with the overall New Zealand population (Statistics New Zealand & Ministry of Pacific Island Affairs, 2011).

The sharing of food is weaved into cultural values for Pacific peoples, playing a significant role in social gatherings (birthdays, weddings and church gatherings). Often foods provided at such gatherings contain high saturated fat, sugar, sodium and are consumed for their flavour and go over biological needs for nourishment and survival. As consuming foods in these settings shows respect and common courtesy (Lilo, 2020). Frequent consumption of meals away from home was linked to increased risk of diabetes, insulin resistance and inadequate dietary patterns, e.g. increased amounts of fizzy drinks, sweets and lower intakes of wholegrains, fruits and vegetables (Bowman et al., 2004; Jaworowska et al., 2013) .

2.5 Physical activity and device use among Pacific pre-schoolers

The Ministry of Health has provided screen time recommendations in the Sit Less, Move More, Sleep Well – Active Play Guidelines for Under-fives (Ministry of Health, 2017b). As sedentary behaviours such as screen time (including television, mobile phones, laptops, tablets, gaming consoles etc.) are recognised as a main contributor to negative physical (e.g. overweight and obesity) and mental (e.g. emotional and attention) health indicators in children (LeBlanc et al., 2012; Saunders & Vallance, 2017; Stewart et al., 2019). The Active Play Guidelines recommend children under two years old are discouraged from screen time and children two years and older should have screen time limited to less than one hour a day with the message of 'less is best' similar to international screen times for children (Ministry of Health, 2017b; Saunders & Vallance, 2017). Excessive calorific intake, poor muscle development, decreased physical activity have been found from prolonged sitting (Connell & McCarthy, 2013; Ministry of Health, 2017a).

The New Zealand Health Survey reported that screen time use per day in the 2-4-year-old age range found 67.2% of children watched more than two hours of screen time per day (exceeding guidelines for the age group of less than one hour daily) (Stewart et al., 2019). Māori, Pacific and children living in areas of high deprivation were more likely to watch 2 hours or more of screen time a day (Stewart et al., 2019). It is suggested that internationally screen time has increased in recent years. Watching television increased from 2.2 to 2.6 and 2.1-2.4 hours per day for boys and girls respectively, Computer screen time increased from 1.3 to 3.1 and 0.7- 2.3 hours per day for boys and girls respectively, thus increasing in sedentary behaviour (Saunders & Vallance, 2017). A systematic review and meta-analysis studying the relationship of screen time and adiposity in Canada found that children who watched more than two hours of television daily were more likely to become overweight or obese (Stewart et al., 2019) as food advertisements targeted at children are likely to play a role (Braithwaite et al., 2013). Though there is evidence to show sedentary behaviour and screen time increases risk of overweight obesity and other negative health outcomes, more research for pre-school children is needed.

For children under five years, health outcomes such as sleep, focus, reduced risk for overweight, obesity and developed movement skills improve when regular physical activity is a part of a child's life compared to other children (Clarke, 2015; Ministry of Health, 2017b).

It is recommended that children under five years of age are provided fun activities, at least three hours spread throughout the day. Fun activities should support physical, social, emotional and spiritual growth. Children should be provided an environment that supports indoor and outdoor active play such as running, jumping on the trampoline, dancing with friends and kapa haka. This will aid in strengthening muscles and bones in growing children (Becker et al., 2014; Ministry of Health, 2017b; Sport New Zealand, 2015).

The positive health outcomes resulting from regular physical activity such as improved bone health, blood lipid profiles, and psychological wellbeing, as well as a reduced risk of obesity and T2DM (Ali et al., 2021; Oliver et al., 2007) are known. Despite this, children's physical activity has declined immensely in the last 20-30 years (Ali et al., 2017). In a New Zealand study using the data from the National Children's Nutrition Survey, It was reported that fewer than half of children participated in an activity after school and even less in the evenings (Utter et al., 2006).

For pre-school children the New Zealand literature is consistent with international findings, that during their time in early education settings there is not full engagement of physical activity needed for this age group, as there is a prioritisation of academic learning over physical activity (Ali et al., 2017).

2.6 Weight and growth of Pacific Pre-schoolers

Within New Zealand, Pacific children have the highest prevalence (27.8%) of obesity compared to Māori- (21.7%), European/other- (8.6%) and Asian- (7.9%) children (Ministry of Health, 2023). Agreeing with literature that there is an overweight and obesity issue with Pacific children living in New Zealand (Howden-Chapman et al., 2000).

Previous research found that a parent's or caregiver's perception of their child's weight will have an influence on the child becoming overweight or obese (Garrett-Wright, 2011; White et al., 2014). Furthermore, characteristics that parents show can determine behaviours children have around physical activity and weight (Scaglioni et al., 2008). Literature has been persistent reporting that parent perceptions regarding child body weight are inaccurate and do not assist in identifying overweight and obesity in children (Butler et al., 2022; Heimuli et al., 2011; Meredith-Jones et al., 2016).

In the Parental Perception of Overweight and Obesity study that used the data from the Pacific Island Families Study, only 31% of parents reported they had concerns about their

child's weight although 59% of the children were overweight or obese (Heimuli et al., 2011). In comparison those in a United Kingdom (UK) study that expressed the concern on their children's current and future weight was 47% with just 26% of these children being overweight (Heimuli et al., 2011). This suggested cultural differences in parental weight perceptions (Meredith-Jones et al., 2016). There are limited amount of studies that agree these ethnic parental perceptions exist internationally as some ethnicities are more accepting to larger body sizes, however more research is needed (Heimuli et al., 2011) .

In New Zealand, Pacific and Māori children have a greater BMI score overall in contrast to their Asian and New Zealand European counterparts (Meredith-Jones et al., 2016) . Studies have shown that Māori and Pacific parents express there are no issues around body weight of children, until there are signs that their physical or mental distress stems directly from weight (being bullied or teased about their weight by other children) (Baughcum et al., 2000; Meredith-Jones et al., 2016). Unless children are severely overweight, Pacific parents may not look for treatment. Parents explained that they did not consider their children to be obese or overweight if children were 'happy', had good friendships and were able to perform physical activities (Butler et al., 2022; Garrett-Wright, 2011).

Socio-economic factors and health literacy of parents played a large role in the accuracy of parental perceptions of weight (Heimuli et al., 2011; Meredith-Jones et al., 2016) and what indicators parents perceive to influence the health and weight of their children. Parents will also consider a child's feelings, appearance and physical activity behaviours when linking health and weight perceptions. This has resulted in perceptions being inaccurate of child weight, thinking children are in a 'normal weight' when in fact BMI was increased.

2.7 Food insecurity in Pacific families

2.7.1 Socioeconomic risk factors

Socio-economic factors are a large determinant of one's dietary intake, as this influences access to food, household income and therefore the ability to buy healthy foods (Pearce et al., 2007; Pearce et al., 2008; Pechey & Monsivais, 2016). Lower levels of school education, income and occupational status further effects obesity (Kuntz & Lampert, 2010). New Zealand children were 3.9 times more likely to be obese when living in the most compared with least deprived neighbourhoods (Exeter et al., 2019; Ministry of Health, 2023). High deprivation neighbourhood's access to food outlets seemed to be increased as companies selling food and drinks that are unhealthy, target children as consumers (Egli et al., 2020); these business were found to saturate areas of high deprivation (Pearce et al., 2007). Pacific children (39.6%) were most likely living in homes where food often or sometimes ran out, in comparison to Māori (35.1%), European/Other (18.0%) and Asian (12.3%) children (Ministry of Health, 2023). These findings strengthen the relationship between unhealthy dietary

habits and neighbourhood deprivation (Egli et al., 2020), in addition to the childhood obesity rates which are already twice as high in these areas (Pearce et al., 2008).

2.7.2 Food insecurity

Food insecurity in New Zealand is a public health issue. According to the National Children's Nutrition Survey, some degree of food insecurity was found in almost half of households that had children (Macaulay et al., 2023; Ministry of Health, 2003). The New Zealand health survey found that 37.1% of Pacific children lived in households with food insecurity compared to 16.2% of non-Pacific children (Oyama et al., 2021).

Food insecurity increases risk to poor child health (malnutrition), development and behaviour (Cook & Frank, 2008; Smith et al., 2010), and is associated with less variety (of foods), less healthy food consumption, high stress and excess of macro nutrients and lack of micro nutrients that are essential for health (Iusitini et al., 2023). Homes facing food insecurity are less likely to purchase foods from the fruit, vegetable and cereal groups attributing to poor nutrition (Iusitini et al., 2023; Macaulay et al., 2023). Furthermore, 34% of Pacific children lived in households that often or sometimes used foodbanks or food grants. Along with Māori, Pacific children also had higher rates than non-Māori/non-Pacific children of sometimes or often running out of food, and ate less because of lack of money (Ministry of Health, 2023).

2.8 Screening tools- to assess nutrition risk

Nutrition screening is used to identify if an individual is malnourished or at risk of being malnourished (Rabito et al.) An individual who is malnourished can fit into three broad categories, namely undernutrition, nutrient deficiencies and over nutrition (obesity) (Seremet Kurklu et al.).

Increased risk of adverse physical and cognitive development, poor immune function, weight loss, length of hospital stay, and recovery time have been linked to malnutrition/poor nutrition in children admitted to hospital ages five and under (Moeeni et al., 2014; White et al., 2016). Although it is not a requirement to use nutrition screening tools in New Zealand hospitals for paediatric patients, most are developed to be used in an acute setting (McCarthy et al., 2012).

A cross-sectional study conducted in Turkey that included 176 children aged between 1-16 years (50% were in the 1-4-year age group), who were admitted to hospital in the paediatrics ward. This study assessed the reliability of three different nutrition screen tools which found that early detection and intervention in children, aided in the prevention of complications related to nutrition and shortened hospital stay. This emphasises that children at risk of

malnutrition should be screened as early as possible to provide the appropriate treatment plans for the child's specific needs (Seremet Kurklu et al., 2022).

Screening tools that have been developed for paediatric patients identify malnutrition risk by changes in food intake, appetite, and body weight, and comparisons to national growth curves, diagnosis and anthropometric measures, although none of these measures have been identified as the gold standard.

The NST evaluated in their study was The Screening Tool for Risk of impaired Nutritional Status and Growth (STRONGkids), Paediatric Yorkhill Malnutrition score (PYMS) and Paediatric Nutrition Screening Tool (PNST). The three NST's found that weight-for-age was significantly higher, and length of stay was shorter in children without malnutrition risk. (Pereira et al., 2023; Seremet Kurklu et al., 2022) agree that two out of the three NST (PYMS and PNST) were found to be suitable for the assessment of malnutrition risk in paediatric patients as they had a higher sensitivity of weight for age 90.9%, body mass index for age 84.6% (PYMS) and height for age 88.9% (PNST) (Seremet Kurklu et al., 2022)

Though NST have been a key driver in identifying nutrition risk and implementing the correct interventions, the majority of NST are used in a clinical setting. Not many are used in a community setting to identify poor nutrition status in children. Currently New Zealand children are offered a "B4 School Check (B4SC)" at four years of age to assess vision, hearing, oral health, general health, growth measurement, strengths and difficulties (e.g. concentration behaviour and getting along with others) and parental evaluation of development status (PEDS) (Health New Zealand & Te Whatu Ora, 2024). The aim is to address any areas identified as a concern and intervene early. It is however not a requirement for 4-year-olds to take. It was found that both Māori and Pacific children were less likely to complete the B4SC even though it is known that starting screening and intervention at a younger age range can be more successful (Gibb et al., 2019). A systematic review of 153 randomised controlled trials found that physical activity and nutrition interventions in the 0-5 year age group may significantly lower the risk of becoming overweight and obese (Hooper et al., 2019). Currently there is little research on nutrition risk screening for children and more specifically in a community setting.

2.8.1 Nutrition Screening Tool for Every Pre-schooler - NutriSTEP tool

The Nutrition Screening Tool for Every Pre-schooler (NutriSTEP) is a parent-administered nutrition risk assessment tool produced and validated in Canada that is available to use in a community setting (Randall Simpson et al., 2015). The tool assesses nutrition risk through a 17-item questionnaire including food group intake, sedentary behaviours, food security, eating patterns (eating frequency, drinking fluid resulting in not being hungry at meal times), fluid intake and parental perception of the child's growth, physical activity and weight

(Randall Simpson et al., 2015) (see appendix B9 for the tool). Each question answered provides a score between zero and four that is then tallied up by the parent/caregiver upon completion to provide a maximum score of 68 and put into cut-off points of either <20 no/low risk, 21-25 moderate risk or 26-30 high nutritional risk (J. Randall Simpson, 2009).

To test the validity of the tool, an assessment was undertaken including anthropometric measurements, a three-day food diary, and a nutritional- and medical history by a registered dietitian (Randall Simpson et al., 2008). A sample of 140 parents of children from the ages of 2-5 years of age completed the NutriSTEP tool. This study focused on determining the reliability and validity of the tool using convenience samples of parents and caregivers from socioeconomic, ethnic and geographical diverse backgrounds. Participants contributed to discussions in the focus group (Simpson et al., 2008). Paediatric nutrition experts were selected to provide consultation in the study. Findings showed the total mean scores of the tool (15 ± 7 for both; range 3–34 of a possible 68) were found to be highly reliable. The Pearson's correlation on the total Toddler NutriSTEP score between administrations was significant ($r = 0.91$, $p < 0.001$), and all dichotomized responses to individual questions had significant k statistics ($p < 0.001$) (Randall Simpson, 2008). The NutriSTEP tool's sensitivity of >86% was found to be higher than the 59-70% sensitivity of malnutrition screening tools designed for hospitalised children (Gerasimidis et al., 2010; McCarthy et al., 2012). Specific food groups lacking in consumption were found as well as other nutritional risk factors. The findings helped to increase the awareness of parents/caregivers.

The Canadian version of the NutriSTEP tool had then been adapted and tested for reliability for nutrition risk screening of pre-schoolers in New Zealand. In the study undertaken by three expert dietitians and parents/caregivers of pre-school aged children, the results showed that participants found the tool easy to use. It was determined that the adapted tool was reliable (ICC = 0.91; $P<0.001$) and sensitivity for the adapted NutriSTEP was higher for pre-schoolers at nutrition risk (31.6%) versus the Canadian version (20.3%) (Wham et al., 2021). Though in the study most parents were in their early to mid 30s, had a tertiary education, used English as a first language and identified as New Zealand European (Wham et al., 2021).

Generally, this tool is acceptable but leaves out an equal representation of the Pacific community who have been seen throughout this literature review to have one of the highest disparities of health in New Zealand. Therefore, further study to adapt the tool further for Pacific communities is needed.

2.9 Co-designs

There is a gap of knowledge around Pacific communities and nutrition screening. Using a co-design/participatory method can help to fill this gap. Co-designs seek to bring researchers and community members together to identify, investigate and analyse problems together (Conn et al., 2022). This method supports different stakeholders and address their needs, using different types of knowledge and experiences from each participating group (Francisco et al., 2022; Slattery et al., 2020). Instead of possibly contributing to the avoidable waste of health research funding that provides interventions that do not meet the needs of end users. This leads to better understanding throughout research and closing the gap to improve persisting health inequalities for Pacific communities in New Zealand (Conn et al., 2022; Francisco et al., 2022; Slattery et al., 2020).

In an Australian church-based lifestyle intervention, 89 Samoans belonging to the church-going community, participated in a co-design intervention. Results from the study found health improvements in the overall sample group. Their HbA1c dropped from 6.4 ± 1.7 (46 mmol/mol) % to 6.0 ± 1.4% (42 mmol/mol) ($p = 0.001$), diabetes knowledge increased from 45.5 ± 15.7% to 60.3 ± 20.1% ($p < 0.001$), and the reported total physical activity increased. Reductions found in waist size and weight have been associated with improved quality of life and improved cardiovascular outcomes (Ndwiga et al., 2020).

2.10 Conclusion

This review describes the risk factors present in preschool aged children that increase risk of poor nutritional status, both internationally and in New Zealand. With a focus on Pacific view of health and Pacific preschool children health. It looks into socio-economic and demographic characteristics of nutrition risk, along with areas of nutrition recommendations that are not being met. NSTs have been found to be a valid and reliable way to identify nutritional risk in children in a hospital setting providing an opportunity to intervene.

The Canadian NutriSTEP tool validated and adapted for use in New Zealand identifies pre-schoolers with nutritional risks in a community setting. Research indicates sociodemographic disparities are apparent with Pacific children having lower intakes of fruit and vegetables and Māori and Pacific children and those living in areas of highest deprivation having the highest rates of nutrition related disease. Therefore, this study aims to assess the acceptability of nutrition screening and intervention initiatives to improve Pacific pre-schooler eating habits in a co-designed feasibility study with stakeholders (Pacific Heartbeat and end-user groups (Pacific communities; parents of pre-schoolers).

Chapter 3: Research Study Manuscript

Title: The feasibility of a nutrition screening tool to improve food habits of Pacific pre-schoolers: a co-designed study

3.1 Abstract

Aim: To collaborate with stakeholders (Pacific Heartbeat and Pacific end-user communities) in a co-designed feasibility study to assess the acceptability and use of the NutriSTEP nutrition screening tool to improve Pacific pre-schooler eating habits. The aim was to assess the appropriateness of the NutriSTEP questionnaire items with end-users', to discuss potential adaptations, scoring methods and recommendations for use of the NutriSTEP tool in the community.

Methods/Design: The co-design method involved extensive discussions with the Pacific Heartbeat stakeholder team to plan the engagement with end-user groups (Pacific communities). Five focus groups were undertaken across communities in Auckland (N=38 participants, mean age 38±10.9 years, 36 females, 2 male) who were parents/carers of Pacific children between the ages of 2-5 years old. Participants completed and provided feedback on the NutriSTEP tool in focus group discussions. Key findings were collated and presented in a final focus group with representatives from the previous round of focus group participants. Discussions enabled the approval of recommended changes for use of the NutriSTEP tool prior to community implementation.

Results: Half of the participants were born in New Zealand with the remaining half born in various Pacific countries, nine participants had a tertiary education while 15 participants preferred not to comment, and over half (58%) of the participants used a first language other than English. Focus group discussions revealed six main themes: 1) The NutriSTEP tool is exposing and eye opening and raised awareness of daily habits, highlighting areas for improvement. 2) The opportunity for parents/carers to self-score the tool to clearly identify nutrition risk level outcomes was preferred. 3) Several proposed wording changes were needed to improve the clarity of questionnaire items. 4) Food group items were ambiguous and needed inclusion of cultural foods in item examples (e.g. taro and cassava in vegetable group). 5) Items related to food habits created a sense of embarrassment and judgement and highlighted the importance of community screening in a supportive group environment. 6) Physical activity, weight and growth items needed reframing to encompass a cultural perspective.

Conclusions: The NutriSTEP tool was acceptable for the most part by the end-user groups. Amendments were needed for specified items to improve cultural acceptability and understanding. Groups sessions for completion of the tool was recommended for successful implementation in the Pacific community. The tool increased parent/carers awareness of nutrition related habits, and highlighted areas for improvement. The development of culturally appropriate resources to enable improved eating habits for Pacific pre-schoolers at all levels of health literacy was identified. Post tool completion resources will include material suggested in this co-designed study to increase knowledge around nutrition related topics.

Key words: Eating habits, nutrition, NutriSTEP tool, Pacific community, cultural acceptability, pre-school aged children

3.2 Introduction

Dietary habits established in early childhood continue through to adolescence and adulthood (McKelvie-Sebileau et al., 2022). Obesity, as a result of poor dietary habits is five times more likely to be experienced in adulthood among those who have experienced it in childhood (McKelvie-Sebileau et al., 2022). Evidence suggests that early childhood is the opportune time to intervene to improve dietary behaviours (Gerritsen et al., 2018), as impaired dietary behaviours leading to obesity can also lead to an increased risk of preventable nutrition-related diseases such as type 2 diabetes (T2DM), colon cancer and ischaemic heart disease (Daniels, 2009).

New Zealand is home to many Pacific peoples (442,632) 8.9% of the population and growing (New Zealand Government, 2024). Cardiovascular disease (CVD) is the leading cause of death among pacific people, with Pacific people being twice as likely to die of heart disease compared to non-Māori non-Pacific people (Minisrty for Pacific Peoples, 2020). Unhealthy diet and physical inactivity being some of the contributing risk factors to this disease (World Health Organisation, 2024).

Pacific peoples have the highest prevalence (27.8%) of obesity in New Zealand (Ministry of Health, 2023) and surveys suggest early identification of Pacific pre-school children with poor nutrition habits may help to lower the risk of obesity and development of chronic diseases in adulthood (Koch et al., 2006).

A recent New Zealand Health Survey showed only 2.2% of Pacific children met the recommended fruit and vegetable intake (at least 2 servings of fruit and two servings of vegetables daily) in comparison to Māori 5.7%, Asian 4.3% and European/other 5.4% (Ministry of Health, 2023), and overall adherence to the Ministry of Health, Food and Nutrition Guidelines for number of servings of core food groups, were low (Gontijo de Castro et al., 2022).

There is a need to recognise the risk factors associated with poor food intake and dietary habits in pre-school aged children (Morton et al., 2017). Pacific children between the ages of 2 and 14 years of age have the highest prevalence of obesity (27.8 %), compared with Māori (21.7%), New Zealand European (8.6%) and Asian (7.9%) children and are 3.7 times more likely to eat fast food at least three times a week compared to non-Pacific children (Ministry of Health, 2023).

Screening for nutrition risk factors among Pacific pre-school children may be a simple, practical method to identify nutritional problems and to increase awareness among parents. The Nutrition Screening Tool for Every Pre-schooler (NutriSTEP) is a community-based questionnaire provided to parents/caregivers to help determine nutritional risk (Randall Simpson et al., 2008). The NutriSTEP tool validated in Canada has been adapted for use in preschool aged children in New Zealand, with changes to food terminology and foreign wording, as well as adapted to the food and nutrition guidelines for healthy young people (Wham et al., 2021).

The 17 questionnaire item NutriSTEP identifies problems with eating patterns and other factors that contribute to children's nutritional status (Haldimand-Norfolk, 2013). It can also help in creating interventions suitable for changing behaviours to improve nutrition in a community level setting (Randall Simpson et al., 2008).

This study uses a participatory/co-design approach in partnership with Pacific Heartbeat, a branch of the Heart Foundation dedicated to improving the heart health of New Zealand's Pacific population to engage with the Pacific community. Pacific Heartbeat offer a range of courses and resources to support Pacific communities, to increase their skills and knowledge around food and health.

A church-based participatory design study, found clear benefits for Australian Samoans with T2DM including improved cardiovascular outcomes and quality of life (Ndwiga et al., 2020). Co-design helps to build relationships and creates a safe space for better understanding of needs, analysing problems and generating solutions (Ledwith & Springett, 2010). Hearing the voices of those who the research/study affects directly, give researchers a better understanding on how to progress with interventions that will be successful with the end-users (Slattery et al., 2020).

The aim of this study was to assess the acceptability and use of the NutriSTEP nutrition screening tool to improve Pacific pre-schooler eating habits in a co-designed feasibility study with stakeholders (Pacific Heartbeat team) and end-user groups (parents and carers of Pacific children)
The objectives were to:

- collaborate with stakeholders (Pacific heartbeat) and end-users (Pacific communities) in a co-design process with extensive discussions to plan the engagement and procedures;
- assess the acceptability and use of the NutriSTEP tool
- conduct five end-user focus groups (participants from different Pacific communities), by completing and providing feedback on the NutriSTEP tool;
- Approve and determine adaptations, access and initiatives for use of NutriSTEP;
- make recommendations for initiatives to improve Pacific pre-schooler eating habits.

3.3 Subjects and methods

Study design

This was a co-designed study connecting knowledge, resources and skills from researchers, the Pacific Heartbeat Nutrition team and Pacific participants (Pacific pre-schooler parents) to assess and adapt a previously validated and reliability tested screening tool for culturally acceptable use in the Pacific community. A qualitative approach, using focus groups was used, to assess the acceptability of the nutrition screening tool and to acquire culturally relevant suggestions / intervention initiatives to improve Pacific pre-schooler eating habits. Ethical approval was granted by the Massey University Human Ethics Committee Ohu Matatika 2 (Application OM2 23/10).

Setting

Pacific community centres across Auckland

Recruitment

The Pacific Heartbeat team approached leaders within local Auckland-based communities they had previously engaged with in nutrition workshops, to pass on information about the study for community members to attend. They also approached an Auckland-based Pacific health hub, who assisted in engaging community groups to participate and aided with information from a recruitment flyer.

Participant information sheets and recruitment flyers were translated from English to Tongan, Samoan and Niuean languages to distribute to potential participants. In addition, Pacific Heartbeat connected the researchers with leaders of the local communities. Recruitment commenced in May 2023 and continued until September 2023 (Figure 1). Participants received a koha (gift) in the form of a $50 food or fuel voucher for their attendance. Organised childcare was provided to facilitate attendance.

Inclusion criteria

Parents/caregivers of Pacific pre-school aged children (2-5 years old)

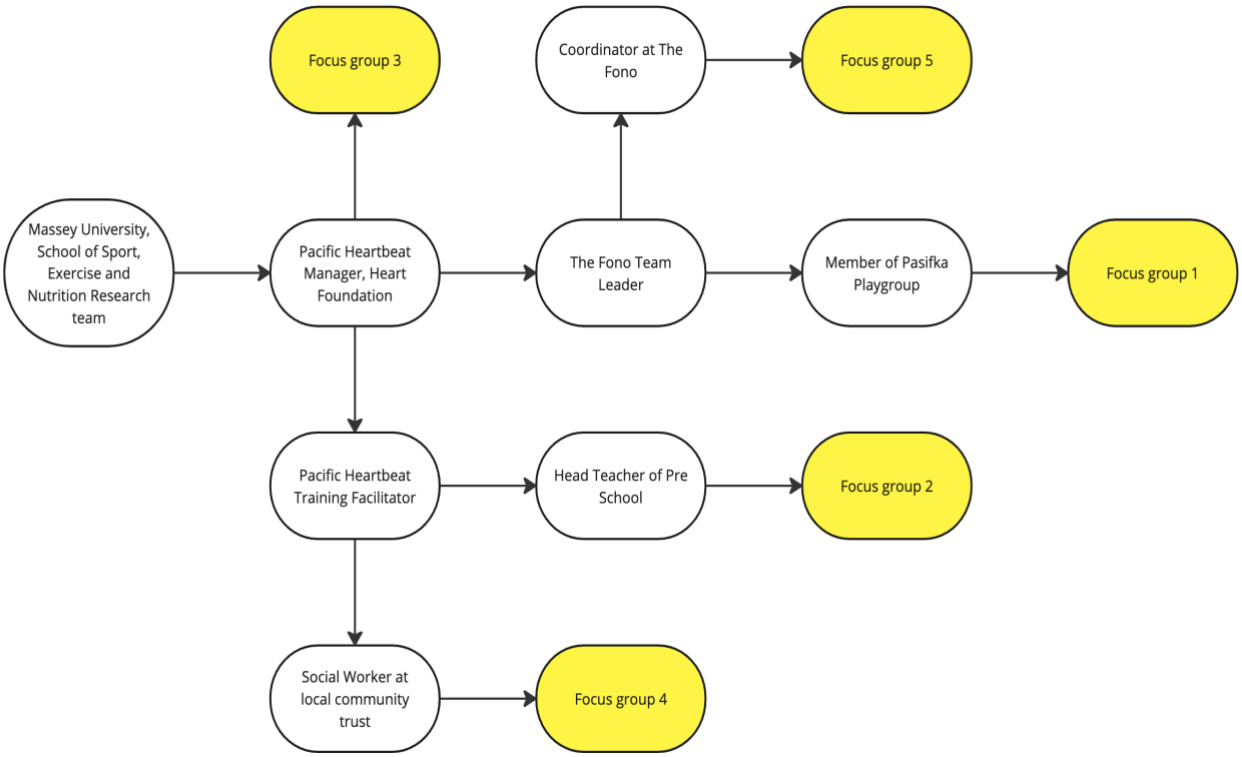

Figure 1: Recruitment process showing connections of how the phase one focus groups were created

Parents/caregivers of Pacific pre-school aged children (2 to 5 years), able to attend a one-hour focus group session, were eligible to take part in the study. Parents/caregivers were eligible if they were carers of a Pacific child. Pacific Heartbeat connected community leaders with researchers to provide further information and to action the recruitment process. Leaders invited eligible people to take part in the study. Collectively, a time and place that suited most participants was established to conduct the focus groups. Focus groups in phase one were capped at 10 participants per group. . Overall, 38 participants were recruited across five focus groups throughout Auckland; focus group 1 had 4 participants, 2 had 9 participants, 3 had 7 participants, 4 had 10 participants and 5 had 8 participants.

Outcome measures

Phase one focus groups (exploration):

An initial set of focus groups were conducted to explore participants' perspectives of the NutriSTEP tool, their understanding of each questionnaire item and to ascertain whether changes needed to be made. The same steps (as below) were followed for each focus group:

- On arrival participant information sheets were provided to be read during refreshments.
- Next, consent- and demographic forms were completed and signed. Each consent form had a unique participant ID (e.g. 1, 2) to protect the participants identity.

- Following, focus group procedures and participation expectations were explained by the focus group moderator.
- Participants independently completed the NutriSTEP tool (paper copy) with as little help as possible.
- Next, the focus group commenced by the moderator, using a moderator guide (See Appendix B10) to guide the discussion. The session was recorded (with consent provided). Researchers noted down the participant ID's during the conversations, to track participant responses.
- Following the focus group discussion, the recording was ended, and participants were thanked and provided with a $50 (koha) voucher.
- Research assistants collected the completed NutriSTEP tools, checked if scores were correctly calculated from answers provided and changed risk levels if they were scored and/or chosen incorrectly.
- Both scores were then presented for researchers to review.

Phase two focus groups (consolidation):

Participants from the phase one focus groups were invited to be the representative spokesperson/s for their group. To accommodate the needs of the representative spokespeople who were located across the Auckland district three consolidation focus groups were conducted online, using the Zoom platform (two attended focus group 1, three attended group 2 and one attended group 3). The same moderator guide (see appendix B11) was used for each final focus group which reviewed the key findings from all phase one focus groups. They discussed and agreed on the adaptations required for the tool and the resources needed for future use of the tool in the community.

Representatives received consent forms and the NutriSTEP tool by email. They signed and emailed consent forms back to the moderator before receiving a notification of the focus group procedure. Each participant was provided with their original unique ID to identify who was speaking at each given time and each session was recorded. Participants were provided with a summary for each of the 17 NutriSTEP items, the scoring, administration and name of the NutriSTEP tool. For individual items, participants were asked how they felt about the feedback and the solutions gleaned from the previous focus groups, and what recommendations they would suggest around "what a helpful resource would look like?"

Existing resources were shown on a shared (zoom) screen, to participants:
- Eating for Healthy Children aged 2 to 12/Ngā Kai Tōtika mō te Hunga Kōhungahunga - HE1302
- Ministry of Health. 2017. Sit Less, Move More, Sleep Well: Active play guidelines for under-fives. Wellington: Ministry of Health

- 6 meals to make on a budget https://www.heartfoundation.org.nz/about-us/news/blogs/6-meals-to-make-on-a-budget
- Growth charts and health professionals' notes – girls used to reference https://www.tewhatuora.govt.nz/assets/For-the-health-sector/Specific-life-stage/child-health/Growth-Charts-v2/girls-growth-chart-well-child-a4-v2.pdf

After discussions of each topic with the proposed changes, participants collectively reached a consensus on final adaptations and inclusions for resources. Participants were sent a $50 voucher in the mail as a koha (gift) for their participation after commencement.

3.3.1 Data processing and analysis

Phase one: recordings were transcribed using an independent transcription provider. The moderator reviewed the transcriptions to determine completeness and accuracy, corrected errors using the recordings, and allocated IDs to each participants' quotes. Interview transcripts of each focus group were imported into the NVivo programme (Lumivero, 2023) for analysis.

After analysing the interview transcripts, common discussions were identified. These were then coded in the NVivo platform to form parent codes (see figure 2) to group similar discussions from the combined data of the five focus groups (see table 3.2). Parent codes were broken down into children codes which meant that the merged data could go into specific categories. All quotes in each category were then compared to find what most participants had voiced. The key findings were then grouped into sub-themes found from the children codes. Key findings from the transcribed data were summarised into feedback provided to the phase two focus groups.

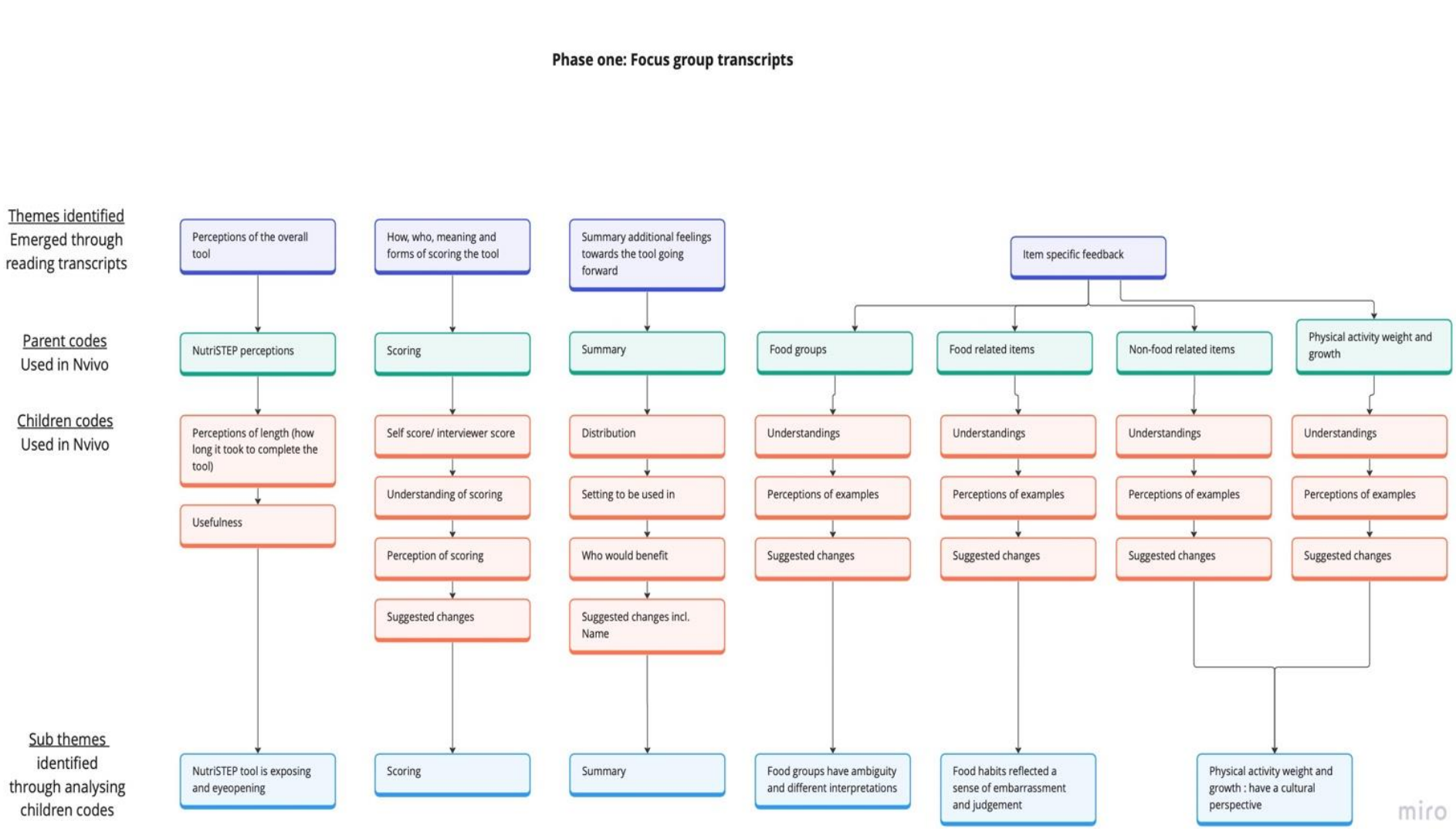

Figure 2: Phase one, focus group transcripts entered into NVivio had themes identified which created grouping of particular themes. Finally determining subthemes presented in the results

Phase two: recordings and automated transcripts saved from the Zoom application were consolidated. The moderator reviewed the transcriptions, corrected errors, and allocated the original IDs to each participants' quotes. Interview transcripts of each focus group were imported into the NVivo programme for analysis.

Each item was added as parent codes to group similar discussions together. Categories that made up sub themes during phase one were again grouped together to create the sub themes. Key findings are presented in the results.

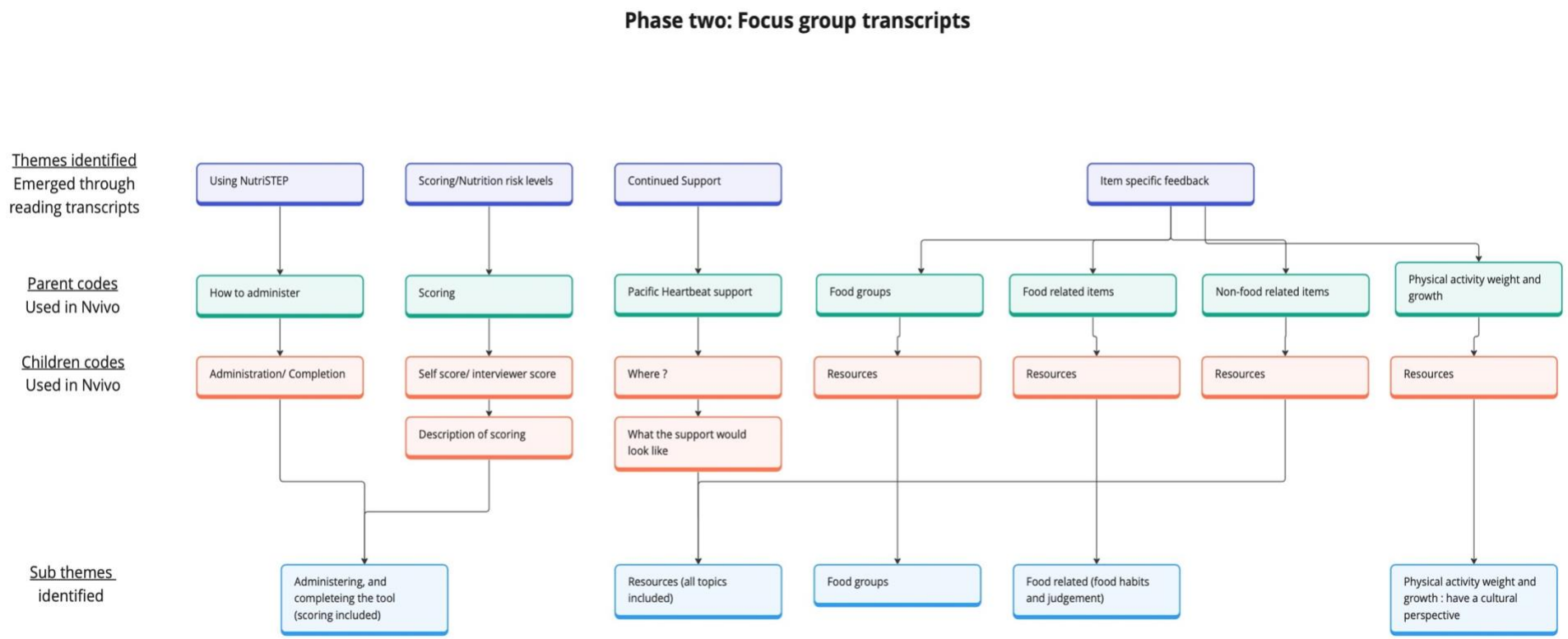

Figure 3: Phase two, representative focus group transcripts entered into NVivo had themes identified which created grouping of particular themes. Finally determining subthemes presented in the results

3.4 Results

In total, 38 participants of various Pacific backgrounds and ages attended focus groups across Auckland. Most were women, 19 were born in NZ and the most represented Pacific group among parents/carers was Samoan followed by Tongan and I-Kiribati. Nine participants had completed a tertiary qualification and 15 preferred not to say the qualification level. Over half (58%) of participants had a first language other than English (Table 1).

Table 1: Participant Characteristics

Participants Characteristic n=38	n (%)
Age Mean and Range	37±10.9 (23-66)
Gender	
Male	2 (5.5)
Female	36 (94.5)
Place of birth	
New Zealand	19 (49.9)
Samoa	3 (7.9)
Republic of Kiribati	10 (26.3)
Nauru	1 (2.6)
Niue Island	5 (13.2)
First Language	
English	16 (42.1)
Samoan	2 (5.3)
I-Kiribati	12 (31.6)
Niuean	5 (13.2)
Tuvaluan	2 (5.3)
Tuvaluan/Samoan	1 (2.6)
Highest completed qualification	
None	4 (10.5)
Secondary Education	5 (13.1)
Tertiary Education	9 (23.7)
Other/Don't know/prefer not to say	20 (52.7)
Relationship to child	
Mother	28 (73.7)
Father	1 (2.6)
Caregiver	9 (23.7)
Parent Ethnicity	

Participants Characteristic n=38	n (%)
Samoan	5 (13.2)
I-Kiribati	8 (21.1)
Cook Island Māori	1 (2.6)
Tongan	6 (15.8)
Fijian	5 (13.2)
Niuean	5 (13.2)
Tuvaluan	2 (5.3)
Other	6 (15.6)
Childs Age	
Two	9 (23.1)
Three	16 (41)
Four	7 (17.9)
Five	7 (17.9)
NutriSTEP nutrition Score	
High Risk	13 (34)
Moderate Risk	13 (34)
Low Risk	12 (32)
NutriSTEP tool self-completion	
Scored correctly	20 (52.6)
Scored incorrectly	9 (23.7)
Incomplete score	9 (23.7)

Twenty participants scored the tool correctly, nine scored incorrectly, primarily due to addition errors and nine did not complete the final score. Nutrition risk scores were recalculated and corrected by the research assistant, for all participants who completed the NutriSTEP tool. Post recalculation it was found that addition errors had resulted in some incorrect nutrition risks scores. Of 38 participants, 13 scored a high nutrition risk, 13 scored a moderate nutrition risk and 12 scored a low nutrition risk.

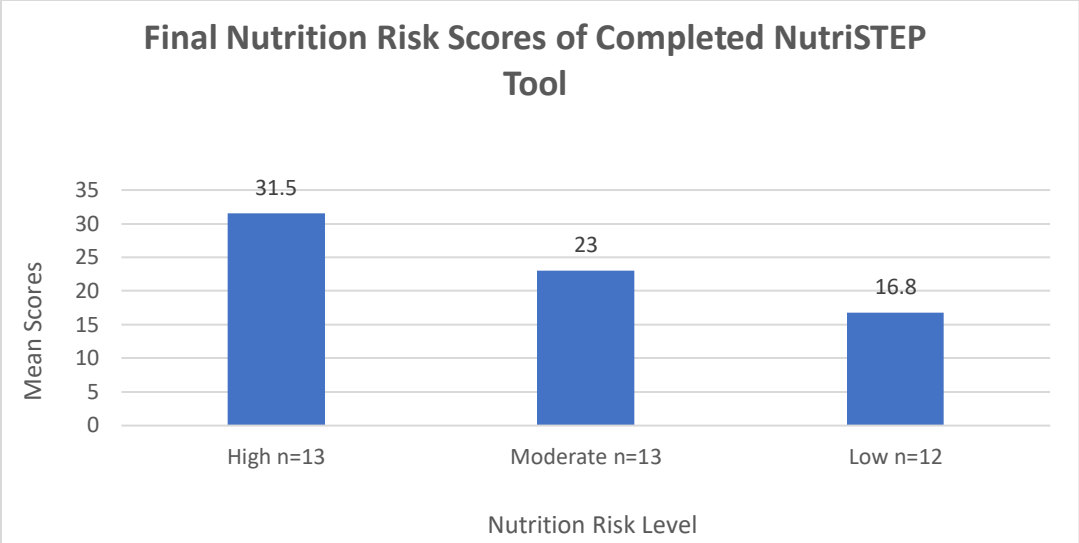

Figure 4: Final Participant Nutrition Risk Scores

3.4.1 Phase one

From the phase one results six key themes emerged from the analysis.

Theme one: The NutriSTEP tool is both eye-opening and exposing

Theme one reflected the perceptions of completing the tool and its results overall. All participants felt that the tool was easy and not very time-consuming to complete (around ten minutes). Most felt the NutriSTEP was a "good" tool to use, and the content was mostly straight forward. Participants agreed that there was a sense of value in completing the tool and recognising the dietary shortcomings of the preschool children in their care. It was considered a great steppingstone to better the health of future generations of Pacific peoples. Participants felt that most of the questions were understandable without any assistance needed.

> *"For me personally, it's a really good tool to know that this is acknowledged for our children, taking time out to survey and care about our children and what they're eating, this helps me as a mum realise, I could do better here in that part of the fruit or the veggies or the bread…." {FG2-P4}*

> *"It's good for us parents to understand about our child and their habits and diets so we can evaluate the standard of what kinds of food we might feed them. And we look at our scores, it seems like I need to reduce the other products and then feed more veggies. It's evaluating me, personally" {FG2-P3}*

The participants felt it was an eye-opening experience, however "in a good way", to complete the tool as it helped acknowledge what is happening with their pre-schooler's nutritional health, bringing awareness to daily habits contributing to nutrition related decisions. They felt it was needed as this is something missed when parents are caught up in the busy-ness of everyday life.

> *"I found it really good. With the total that I've seen, I've been like, wow, I've got to make a huge change in my home. Like you said, it's what our babies are eating and as they grow up the diabetes and all that. It was a real eye-opener for me" {FG2-P3}*

> *"Useful to many whānau out there. There's a lot of whānau, I know who if they go through this and see the score and seeing the answers. It's like, whoa, it's actually an eye-opener" {FG2-P4}*

Some participants reported they felt that completing the tool was exposing / confronting when asked about eating habits. As they want to be doing the best for their children and these answers may not mirror that. Some participants felt they struggled with children being fussy eaters and it can be a challenge to get them to eat "good" food. Participants had thoughts that this may be something they deal with alone, not wanting someone else to know what is happening in their personal life and being judged. It was expressed not giving the 'right' answers made them feel bad. However, the group setting in which participants were sharing their thoughts, turned out to be a positive experience as there was an element of relief discovering parents were facing similar challenges.

> *"It was really good. One question was a little bit exposing, but good exposing. The fast food one. I was like, I wish I could say once a week, but if I'm being honest, it's probably twice…." {FG3-P23}*

> *"Yeah. A little bit confronting" {FG3-P21}*

> *"Exposing but really good. I feel like in a good way" {FG3-P23}*

<u>Theme two: Interpretation of food groups and their composition</u>

Food groups for dairy, meat and poultry were easy to understand and examples provided were helpful. However, participants reported some food groups were not as easy to interpret. They felt that "more information" was needed to provide accurate answers as they were unsure about specific food (types) and serving sizes to consider when completing the tool. Differences in interpretation were observed across focus groups.

"It's the example, like if it's four Weetabix, that's already two serves, three serves in that one sitting…. .to us, that's one serve, or to some people that might be one serve, but actually it's two serves" {FG3-P4}

Most participants interpreted that "fresh" did not include frozen or canned fruit or vegetables. Therefore, canned and frozen fruits and vegetables were not included in the total daily consumption. Unless it was fresh from the supermarket or garden.

"Canned fruit. I would have left it out because it says fresh fruit" {FG-3P20}

"They're not fresh unless we're going to have to grow our own garden or something" {FG5-P38

It was expressed that some of the food examples were not representative of traditional Pacific foods e.g. taro and cassava. Participants were unsure if it would go into the vegetable, breads/cereal or grains group as a carbohydrate. It was felt that food examples representative of the Pacific people's culture needs to be included.

"That's not veggies, potatoes and taro are not veggies….?" {FG3-P26}

"Yeah, a few examples because with a Pasifika person they won't know where taro comes under and they might put it under vegetable, or yams, casava…" {FG5-P36}

"But they did say some of the foods that were given as examples they don't feed the children. So, with these food like pasta, roti, wraps, their children don't eat that" {FG4-Translator}

There was also confusion around what 'fast foods' were, and where 'snacks' would fit. Takeaways would a relevant term to use over 'fast foods' with the addition of examples.

"I just wanted to clarify what fast food meant, because I didn't really know" {FG3-P21)

"… Frying sausages and rice, or bacon and rice, isn't that fast food? I always cook that at home" {FG3-P26}

"If they're trying to capture things like potato chips, crisps and all that other junk as well, that's fast food" {FG3-P22}

Theme three: The impact of learned food habits and associated judgement

Theme three, reflected feelings of judgement on learned food behaviours or habits, putting a spotlight on uncomfortable topics contributing to nutrition decisions. The participants that voiced these feelings ranged between generations depending on how they have been brought up in the different Pacific cultures. Discussions within the groups indicated if the tool was administered in a health care setting it may provoke a sense of embarrassment and judgement, leading to dishonest answers. However, in a supportive environment like a focus group, participants felt they were more comfortable to be honest.

> *"I wouldn't answer right. I would probably lie on a few questions so I wouldn't look so bad." {FG1-P32 T}*

> *"It could be worded - a question of, 'do you have difficulty deciding what food' as opposed to 'buying'". {FG3-P22}*

> *"Yeah, something similar to this [group]. Not just, give it to you when you go to the appointment" "Not a one-on-one session. A group session, you'd feel more comfortable with others around you" {FG1-P27,28}*

Most participants felt that items about chewing, eating frequency and drinks were easily understood. Some participants suggested to include, breakfast, lunch, dinner and snacks
for "My child usually eats" item, to ensure that all meals and snacks are included in the answers.

> *"Do you mean main meals, or did you mean snacking included?" {FG2-P7}*

> *"It's kind of like breakfast, morning tea, lunch, afternoon tea, dinner" {FG3-P23}*

Participants were not sure if "My child has problems chewing, swallowing, gagging or choking when eating" referred to a child with or without a medical condition. Many participants voiced that their child may revert to choking and gagging when provided foods they do not want to eat.

> *"It could be a question for mums who want to participate or parents in this project with babies that have disability" {FG5-P37}*

> *.... "But with fussy eaters, he's very visual and he will just make his mind up that he doesn't like something, then he'll eat it, and all of a sudden, he's… choking, gagging" {FG3-P21}*

Participants described that in Pacific culture, food is used to show love to each other in the family. Eating food is a celebration that fosters togetherness, whether a church event or weekday dinner.

Participants shared during childhood, parents gave sweet treats as a surprise or when they were feeling down; as a way to express their love. Now parents themselves, some repeat the pattern letting children eat whatever they want and battling (themselves) between giving children what they like (treats) versus giving them healthy food (fruit). As this is such a big part of the Pacific culture, some parents are finding it hard to unlearn these ingrained habits around food and emotions.

> *"That's something I struggle with as a parent, like I don't want to get my emotions confused with love.... "to me, chocolate and lollies with my father was love" …." It's hard because of my upbringing and you know, unlearning…." {FG2-P8}*

> *" … a reminder to us parents how much you give your child, especially Pacific families, most of the kids are big even though they're seven/eight, from the small age, they love feeding our kids". "We think that we are loving them, feeding them" {FG3-P26}*

Theme four: Weight and growth: a cultural perspective

Participants recognised weight and growth were important for child health. However, they did not know what standard to use to assess/interpret their child's growth rate and weight, and therefore felt unsure about answering questions correctly. Additionally, this topic was viewed as something that was not important to discuss with others.

> *"The others agree. They don't really know what it means to be growing well…. Examples would be useful, more information about how they know if their child is growing right" {FG4-Translator}*

> *"Like growing in height or growth?" {FG5-P38}*

> *"Growing up as in age. That's what I would think…… For Pasifika, if we have mothers that have come from overseas, they might, be like, "Sis, what this growing mean?" In our language -growing is growing up for where I'm from" {FG5-39}*

Participants were open to discussing weight but from a cultural perspective struggled to see the importance around weight. They believed if both parent and child are happy and comfortable with the weight, there would be no further consideration. Weight associated with body mass index (BMI) scale as that is how weight has been presented in healthcare settings. Participants felt that BMI did not accurately represent Pacific cultures and was not fair to compare Pacific and European children on the same scale, on the belief they are genetically built larger.

"As a parent I'm comfortable because she's quite a big girl, but then she's comfortable. She's running, eating. Then you go to the doctor's and they're like, "she's a bit overweight" {FG3-P24}

"That's a fact. Tongan children, Tongan people are known to have the biggest, heaviest bones in the world. Then you put a Tongan kid on that chart, it's not fair, and it could give them a complex…." {FG3-P23}

"Our family will always make fun of us for exercising. But with western, Europeans they're encouraged. They're like, "Keep going." {FG5-P39}

Participants felt unsure how to answer the physical activity item, from confusion regarding the definition of physical activity and how much was 'enough' for their children. Participants mentioned children walk, chase after siblings and run around at pre-school. However, they were unable to identify if these counted as physical activity. They would have liked information regarding recommended activities for pre-school aged children.

"Just the way it's worded, it's like 'needs more physical activity', 'gets enough', and it's like, how much is enough?" {FG3-P20}

"What does 'needs more physical activity actually mean?' Does it mean because I see my kid not hardly moving or is it because they're overweight or what?" {FG3-P21}

Theme five: Strategies for completing and using the tool

Participants preferred to score the tool themselves as their own score would empower them to take ownership of their child's health and wellbeing. They felt that having someone else score and interpret the tool on their behalf was a more judgemental approach. Many felt it was good to identify themselves, what needed to be changed motivating them to make some changes in the home.

"*Kind of adds that bit of motivation at the end. Like, oh, I really want to know, and then you're like. It's going to motivate me" {FG3-P20}*

"Because we can see, for ourselves too, what we're eating as well in our home" {FG2-P4}

Suggestions of having the tool available both online and paper (hard copy), having the online version scoring automatically. This would remove the possibility of participants trying to change the score before it is seen, especially if they felt their score was bad.

"I don't mind. I prefer that, someone scored for me. Then it's not biased?" {FG4-P18}

"It's true. All of us here were probably like, should I change it?" {FG3-P23}

" There's parents that probably won't want to share that because they'd be embarrassed" {FG3-P20}

Once scores were calculated, participants struggled to interpret what the scores meant. They understood there were different levels of risk, though the meaning of the nutrition risk levels were unclear. Participants felt it would be beneficial to include a section explaining each of the nutrition risk levels and what they mean for the child.

"What does it mean, your total score then? What's the low risk?" {FG3-P24}

"Well, I had to ask my niece to explain it because I didn't know. I was like, "oh no, I'm under twenty, so what… there must be something wrong" {FG3-P21}

"Yeah it was good, maybe if you're in the high-risk bracket, have like something where you can bring your high risk down to a moderate risk, what you can do? Or if you're on low risk what you can do to bring your score up to a moderate or something like that" {FG1-P27}

<u>Theme six: Future use of the screening tool.</u>

Participants valued the use of the screening tool and the face-to-face discussion with community members. This helped them to feel comfortable and encouraged openness with answers after hearing others express struggles/experiences candidly.

"What I valued most out of it, was the discussion, the face-to-face, just creating that safe space for everyone to speak their truth, and then having other parents speak their truth made you just reveal a little bit more. That's when you're going to get the more accurate results" {FG3-P21}

"That was a big like- I'm in my place, my people understand me" {FG3-P23}

Participants discussed potential modifications to the tool, mainly to increase inclusiveness and engagement within Pacific communities. They recommended translating the tool into Pacific languages (Samoan, Tongan, Niuean, Tokelauan etc.) This would help ensure participants feel included in the conversation about their children's current and future health and be more familiar with what is being

asked in the tool. Many Pacific peoples living in New Zealand speak their native language, thus having a translated tool would assist in making the tool better understood.

> *"Having it in your own language makes you feel a lot more included in the conversation" {FG3-P21}*

> *"Less intimidating to come try stumble across words you don't understand" {FG3-P23}*

> *"I might actually take my time with this because it's in my language," or some of the words" {FG5-P37}*

It was indicated that some questions were difficult to understand, especially without prior nutrition knowledge. This highlighted a need for educational support on topics such as food groups and portion sizes. This is the natural next step in using the tool, namely, to provide education on areas where misunderstandings or high risk become apparent. Understanding what a portion size is or which foods are included in the food groups e.g. vegetables, would enhance the quality and accuracy of the responses. Some participants felt they would have answered questions differently if they were better informed in these areas.

> *"Such a great tool, and I think there's power there for it to be used. It's just those little tweaks, education. I mean, for a lot of Pacific, growing up in Samoa… there was no distinguish… you look at a taro or you have starchy vegetables, and that's your vegetable. There was no conversation around, let's have green salad and so forth. It was all mixed in one. Education around that I think would be powerful… because without the education, you can't really truthfully answer all of the questions" {FG3-P20}*

> *"……I know it says here the word "times" refers to at least half a standard serving, but for parents that actually don't know what a standard serving is, it's good to have visual examples" {FG3-P20}*

Participants were unsure on what NutriSTEP meant. There is no one word that can be translated into all Pacific languages. It was suggested the name remain unchanged, but a translation outlining what the tool is used for, be provided in all Pacific languages would aid in the familiarisation and understanding of the tool.

> *"But even if the name wasn't changed but if you had a blurb underneath in the different languages about what it was, something like that?" {FG5-P36}*

It was suggested that this tool would be beneficial for *all* individuals caring for children aged 2 to 5 years, regardless of the child's health status. It was recommended everyone should have the

opportunity of completing the tool to assess nutrition risk. Places to offer the tool that were suggested were early childhood education centres, churches, mum groups, community groups and churches.

> *"Our community" {FG4-P1}*

> *"The kids would benefit from it in the long run. But it's a whole family. I think it would benefit the whole family because once you change the way that your child's eating, obviously, that's going to encourage the parents to be influenced by those changes" {FG3-P20}*

> *"I think everyone should have the opportunity to do it" {FG5-P37}*

3.4.2 Phase two

To consolidate the findings from the focus groups, discussions were collated and provided to representatives from each group in a follow up round of three focus groups. Representatives engaged in discussions to reach final agreement on the adaptations and resources required for future use of the tool.

<u>Theme one: administering, and completing the tool (scoring included)</u>

Participants reiterated and agreed on having the option to complete the NutriSTEP both on paper (hard copy) or online (electronically) thereby, catering for a diversity of parents/caregivers. There was support for using the tool in a variety of settings such as churches, mum groups, community groups, early childcare centres, GP centre's or with a Plunket nurse. There was agreement for completing the tool in a supportive group setting, as opposed to one on one or independently.

> *"… Personally, I think there needs to be not just one option…. But also having that kind of support…" {FG-P20}*

> *"I agree. I think it's always good to have options. And just as [participant 20] mentioned for different types of people, and also for support…. Some people prefer face to face, which is always good, but others might not have the time. Sometimes, but can still be online with stuff" {FG-P22}*

> *"I think it's better to have a face-to-face group and talk about it like discussions with other people about their opinions, we value their input" {FG-P03}*

Participants maintained the desire to score the tool themselves, to see their final score and risk level. They thought there would be a sense of embarrassment if someone else were to score the tool on their behalf in a group setting.

"…. I mean for me if I like really wanting to know the score for me, it's the outcome at the end. And yeah, knowing what I need to improve on. And to be honest with myself, not being able to go back and change my answer. Online is once you answer, it can't go back.... Maybe, having a bit of restriction on that so that it cancels out the chance for people to ponder and keep changing their answers." {FG-P20}

"I think self-score is better… because it's your own evaluation with you and your child. If you like, look at the score at the end and be like 'oh!', you know it's not good…. deep down, you already know like, wow, I really needed to make some changes" {FG-P37}

"… you feel embarrassed when like when someone's telling you your score. But the other people they are looking at you, yeah, it's better to do it yourself……." {FG-P03}

Participants expressed the need for addition of an explanation to accompany the levels of risk as there was confusion on the terminology used for high versus low risk, e.g. a high score meaning the nutritional risk is higher for the child. Participants further suggested having an easier way to identify the levels of risk such as coloured smiling faces, would be helpful.

"…Going back to the visual…. colour like a red, an orange, and a green, on your high risk, low risk. And eventually the child's mouth might be a bit of a frown, and then with… the red, the orange, and then green, the frown, turns into a smile….." {FG-P22}

"Or even like the scale. At the moment I'm high risk…. but I'm going to keep trying to make changes and try and get down here…. That's where I want to be on the scale...." {FG-P20}

<u>Theme two: food groups</u>

Participants came to the consensus that visual examples of food portion sizes were needed for parents/carers to understand and answer food related questions accurately, as interpretations of a standard portion size varied between participants, which could result in an inaccurate final score.

"I think definitely visual examples would be good… Let's say, if you know a serving of bread is equal to, X amount. And then showing that." {FG-P20}

"…. A little bit unsure of what a standard serving for a child is. It would be cool to maybe have an example like a photo…. portion or the hand size." {FG-P37}

"The photo is really good…. Once they look at the photo, they understand…." {FG-P03}

Written examples for food groups such as fruit and vegetables were deemed a priority inclusive of foods of cultural importance to Pacific peoples. Examples of foods with a photo or picture especially for fruit and vegetables was needed to avoid confusion. Clarification was also needed regarding types of fruit and vegetables with regard "fresh, frozen or canned".

"I think the examples should be mentioned. What kind of fruits is the question about?... The pictures will show them what the fruit looks like. That's the other thing., if you mention other fruits that they haven't eaten before, they feel confused…." {FG-P03}

"…. Like everyone knows fresh, is you just go and grab it and eat it. Yeah, including frozen and canned fruit. It shows that they are all included in that question" {FG-P03}

"Having examples like what kind of vegetables and the pictures that will show the vegetables…. Cause in Samoa we are not putting taro as vegetables. They are like starchy food; they are not vegetables…." {FG-P03}

<u>Theme three: food related habits</u>

Participants concurred a need for clarity on items relating to problems with chewing, eating frequency and drinking versus eating. To reduce ambiguity in relation to the item on problems with chewing participants recommended "all children included" should be added and "all meals and snacks" be included in relation to the item on eating frequency.

"I think some parents they would probably put that in their answer, like if their child did have a disability, or even if their child was on a tube or something…. because it would say 'all children'." {FG-P37}

"Yeah, for all the children cause even other children like non disabilities. They can choke" {FG-P03}

"I think, you should mention what sort of food the question is about, is it about all the food for the day, or like breakfast lunch and dinner…. Is the question all about those main meals?" {FG-P03}

Item 7, "I have difficulty buying food to feed my child because food is expensive", brought uneasy feelings to the forefront for participants, especially if unable to buy food because of financial

constraints. They felt they might lie in a real scenario to avoid being judged. To help lessen feelings of judgement, participants recommended "Our budget doesn't allow us to buy all the food I want for my child" to be added to this section.

> *"… I don't know if we could, reword a little bit to make it sound not like- "{FG-P37} …… "So, it's not as offensive" {FG-P28}*

> *"Like some people, they don't want to tell the truth…. but They are struggling. I think if we vice versa like, do you need support? something like that" {FG-P03}*

Theme four: Weight and Growth

Participants viewed items on weight and growth with a cultural perspective where the focus is related to whether the child seemed happy and healthy, as opposed to worrying about what the weight is on the scales. Participants felt unsure about the ideal weight for their child and age group. They expressed a need for resources to explain about growth and weight.

> *"Emphasize that- 'your perspective'…. But we're wanting to be honest. That'll be awesome Putting that [growth chart] in…. show the parent… of the child where the weight should be, using the European BMI- "{FG-P37}*

> *"I think, having pictures, in Samoa we are using pictures like a child standing, then they show the height numbers, the body size, that will be helpful…. They use different sizes like one child is slim, one child is a medium size and the fattest child…. that's the other idea of having a resource for that question" {FG-P03}*

> *"I think it would be very good if there was like, the health not so much focusing on the weight but maybe looking at like the other stuff around it. I guess it's because they're still quite young…... to me, if your child is happy, they're happy…." {FG-P37}*

Theme Five: need for support and Resources

Participants expressed that they would like to see resources that contributes to increasing their knowledge and understanding of the different categories of items in the NutriSTEP tool e.g. food groups, growth and exercise. For the food groups, serving sizes and quantity per day of each group for pre-school aged children seemed to be an important need. Secondly, having a resource with examples of a variety of foods to consume. There was an emphasis on visuals to be provided in the resources.

"I think it definitely needs to be a 'why'… I mean it says there, 'eats breads, cereals and grain products.' But what's the difference between what's better for you? Pacifika we enjoy our white rice and white bread. So, I could put that more than 5 times a day I give my child white bread, not knowing I should be going for the whole grain" {FG-P20}

"Like pictures of different dairy products. And how much dairy a child should be having? Maybe just include the servings and for each age group" {FG-P28}

"And if you had a resource around vegetables, how much to consume. I think having like a table with the pictures, and they can put numbers on it like how many taro, how many starchy vegetables to have each day" {FG-P03}

Participants confirmed that resources should include budget friendly meal ideas that are quick and easy for parents/caregivers. Another suggestion was for 'food swaps' to identify healthier options when cooking or going out for meals and suggested services that help with budgeting and food packages.

"…. Quick and easy recipes that are budget friendly. Because, we know parents are so time poor. Even tips on planning- like meal planning for your family. Making food and bulk freezing, tips like that I think would really help parents…." {FG-P20}

"A resource on swap-out ideas for certain foods, because there is some real nutritious stuff that doesn't- you don't have to buy so much quantity to get nutrition…." {FG-P22}

To aid in lessening screen time participants expressed a need for pictorial resources to include recommendations for physical activity for pre-school aged children. Parents wanted to know if children should be having more hours of active play. To accompany this resource pictorials around recommended growth and weight for the 2-5-year-old age group would assist.

"Maybe a table showing what physical activities and how many times a week they should be doing something" {FG-P28}

"Do you have any limits like with screen time, ……. Like the 2 to 5 years… like, how long they are on, or watching" {FG-P37}

Participants voiced experiencing a sense of community when discussing nutrition in a group setting, bringing everyone together with focus on the health of all. Having a safe space to discuss experiences and children's health was necessary.

"Group sessions are good out in the community. Bringing everyone together, for one reason. Let's look after your health, wellbeing and just getting more, information…. It's always good to do it in a group……Cause then they just start building off each other like, the ideas. And then that's when they just open up about things, experiences they can relate to…" {FG-P37}

"In the community. Even church will be good...." {FG-P28}

Table 2: Summary of focus group participant suggestions for improvement of nutrition assessment tool and initiatives to improve pre-school aged nutrition (NutriSTEP):

Characteristics and NutriSTEP questionnaire items	Preferred option	Suggested resources
Best methods to administer the tool	Provide option to complete the tool online and in hard copy. Group settings preferred i.e. Mother groups, community groups, church groups, childcare centres. If one-on-one could include at GP and Plunket nurse visits.	Community groups such as mother groups, community groups, church groups, childcare centres.
Preferred naming of NutriSTEP tool	NutriSTEP name acceptable but needs explanation of purpose in all Pacific languages i.e. "*The NutriSTEP screening tool can help to identify what is going well and what to work on to improve your child's eating and activity habits. It only takes about 5 minutes to complete* "	None suggested
Scoring the tool	Preference for self-scoring or if completed online, for scores to be totalled automatically. Scores should provide an explanation for levels of risk i.e. Low risk: *Your child's eating and activity habits are good. There may be some areas you would like to work on* Moderate risk: *Your child's eating and activity habits can be improved by making some small changes* High risk: *Your child's eating and activity habits can be improved by making some changes*	Utilise appropriate resources (hard copy or online) to inform the scoring (see below)
Questionnaire items		
Item 1:	Provide a pictorial guide on what a standard serving size is for all food groups	Related to items 1-5,

My child usually eats bread, cereals and grain products: *Examples are bread, buns, breakfast cereals (i.e. Weetbix, porridge), pasta, rice, roti, wraps and crackers*		1. Pictorial guide of serving sizes i.e. using plate, palm size and cups 2. Table providing servings per day 3. Pictorial examples of variety of foods 4. Explain importance to include daily 5. Explain Difference between wholegrain and white options
Item 2: My child usually has milk and dairy products: *Examples are cow's milk, flavoured milk (i.e. chocolate), cheese, yoghurt, custard, dairy foods and fortified soymilk.* *(This excludes almond, rice and coconut milks and products).*	No change	1. Explanation of milk types (e.g. green, yellow, light blue and dark blue tops) 2. Explanation of safe and healthy alternative milks (e.g. soy)
Item 3: My child usually eats 'fresh' fruit	Include *' frozen and canned fruit '*	1. Provide fun ways to eat fruit
Item 4: My child usually eats vegetables:	Include popular *'starchy vegetables such as taro, yam, cassava and kumara and green vegetables including taro leaves'*	1. Provide fun ways and recipes to include vegetables
Item 5: My child usually eats meat, fish, poultry or alternatives: Alternatives can be eggs, peanut butter, tofu, nuts, or dried beans, peas and lentils	No change	1. Provide Pictorial of alternatives and how they might be incorporated into meals
Item 6 My child usually eats "fast food"	Include *'Fast foods relates to the term "takeaways" e.g. fish and chips, burgers etc'*	1. Provide recommendations about how many times a week/month child should eat "fast food" 2. Provide healthier 'fast food' options

		3. Pictorials for acceptable fast food choices
Item 7: "I have difficulty buying food to feed my child because food is expensive"	Include *'Our budget doesn't allow us to buy all the food I want for my child '*	1. Provide budget tips. Provide recipes, shopping tips, suggestions for meal preparation on a restricted budget 2. Compile information on services that provide support for budgeting, provision of food parcels or food donations 3. Provide quick and easy meal ideas
Item 8: My child has problems chewing, swallowing, gagging or choking when eating:	Add '*All children included*'	1. Provide safe ways to prepare certain foods 2. Safe foods to prevent choking Pictorials
Item 9: My child is <u>not</u> hungry at mealtimes <u>because</u> he/s he drinks all day:	No change	1. Provide recommended fluid intake for children 2. Pictorial of healthy drink choices and recommended quantities
Item 10: My child usually eats: * Less than 2 times a day * 2 times a day * 3 to 4 times a day * 5 times a day * More than 5 times a day	Include explanation '*relates to all meals and snacks*'	1. Provide recommendations for meals and snacks for a child throughout the day
Item 11: I let my child decide how much to eat:	No change	1. Provide tips around healthy eating (not using food as rewards, hunger cues)

Item 12: My child eats meals while watching TV or other digital devices	No change	1. Provide information around healthy mealtime practices and avoidance of screen time when eating
Item 13: My child usually takes supplements: *Examples are multivitamins, iron drops, fish oil*	Include '*Does not include prescription supplements*'	1. Provide explanation of what, when and why supplements are recommended
Item 14: My child: * Needs more physical activity * Gets enough physical activity	Addition of '*Recommended 3 hours a day for pre-schoolers spread throughout the day. Mixed play and activities indoor and outdoor e.g. Walking the dog • Biking on the flat• Playing at the park or pool •dance'* next to or beneath the item	1. Explain What is considered physical activity 2. Provide recommended amount of physical activity for children
Item 15: My child usually watches TV, uses the computer/other devices, and plays video games	No change	1. Recommendations for screen time per day for children 2. Suggested educational apps/programmes during screen time
Item 16: I am comfortable with how my child is growing	Provide growth chart and explanation with the tool	1. Growth chart and how to use and interpret 2. Pictorial of children's growth and development stages
Item 17: My child: * Should weigh more * Is about the right weight * Should weigh less	Include '*My child is regularly weighed by a health professional*'	1. Lifestyle habits to maintain a healthy weight 2. Guidance for healthy weight by age

3.5 Discussion

This qualitative investigation identified a range of specific amendments to improve the acceptability of the NutriSTEP tool for Pacific parents/carers. Focus group participants provided helpful feedback and areas for improvement across the NutriSTEP questionnaire items.

Questionnaire items (1-5) related to food groups were often ambiguous for participants, necessitating additional information for more accurate responses. Given that over half (58%) of participants did not use English as a first language, and only nine participants had a tertiary level qualification, there was a wide variance in health literacy levels. Incorporating visual images of food items within the questionnaire items was recommended to enhance recognition and identify appropriate serving sizes.

It has previously been shown that differences in language and cultural beliefs are barriers to communications and the use of simple pictures, models and charts can improve Health literacy (Beale, 2017). Use of this strategy also ensures that the food items added to food groups are culturally appropriate. For instance, in the current study there was confusion regarding the word 'fresh' in the fruit and vegetables item which seeks to determine whether preschool children eat the recommended two servings each of vegetables and fruit each day (H. P. A. Ministry of Health, 2017). Findings suggest parents might respond more effectively if the questionnaire included descriptors such as fresh, canned, or frozen, along with visual examples of 'standard' serving sizes.

Participants expressed confusion regarding recommended serving sizes for certain food categories, such as breakfast cereals, with uncertainty about whether a serving of Weet-Bix was two or four pieces. Additionally, there was ambiguity about the categorization of foods, for instance, whether starchy vegetables like potato, taro, and kumara should be classified as vegetables or carbohydrates. Participants expressed, they would have put them in another category or as carbohydrates.

Inclusion of culturally significant vegetables such as taro was deemed important by the participants to feel 'included' in the conversation. Globalisation has challenged traditional food consumption and preferences showing these may not be eaten as frequently (Evans et al., 2001). Nevertheless, Pacific vegetables were voiced as traditionally important foods by the participants. Though most (44.7%) of participants were born in Auckland, New Zealand followed by I-Kiribati (26.3%) and Niue Island (13.2%) culture and tradition runs strong through the generations and consumption of traditional foods continued to be practiced.

In the current study items such as "I have difficulty buying food to feed my child because food is expensive" and "my child usually eats fast food" raised concern for the participants because they didn't want to be judged for suboptimal food provision for their children. Participants admitted they would lie about how often fast food or takeaways are eaten to avoid embarrassment about not being able to

provide alternative meals. It is well established that over a third (37.1%) of Pacific children live in households with food insecurity compared to 16.2% of non-Pacific children (Oyama et al., 2021). Therefore, optimal healthy food provision is challenging for many Pacific parents.

These findings highlight the need for a non-judgemental space to encourage honest responses to sensitive topics. Pacific peoples are relationship-based people and need clinicians and healthcare workers that shows understanding of their needs/life to have trust established. Without this trust there may be a block to be 'open' and tell the truth (Robinson et al., 2006; Sheridan et al., 2023).

Item 9 "My child is not hungry at mealtimes because he/she drinks all day" and item 12 "My child eats meals while watching TV or other digital devices' (see table 2), appeared to be acceptable to participants and no suggestions were made to adapt these items.

In relation to Item 11 "I let my child decide how much to eat" participants described that food is used to show love to each other in the family. Provision of treats or takeaway food for their children is therefore an expression of love and some parents found it hard to unlearn these ingrained habits.

> *"That's something I struggle with as a parent, like I don't want to get my emotions confused with love.... "to me, chocolate and lollies with my father was love" …." It's hard because of my upbringing and you know, unlearning…." {FG2-P8}*

This pattern may lead to children indulging in sweet treats and snacks, possibly leading to negative health risks. As snacking and over consumption of food is associated with positive energy intake and may increase risk of overweight and obesity if snacks surpass children's daily energy requirements (Xue et al., 2019).

When participants answered item 8 "my child has problems chewing, swallowing, gagging or choking", they were unsure if only children with a disability were included and suggested amending the item to have *'All children included'*. Participants were uncertain if Item 10 relating to frequency of eating related to all main meals only or main meals and snacks, hence this item required clarification.

Similarly, participants questioned if prescription supplements were included in the item "My child usually takes supplements" and recommended the item include "Does not include prescription supplements".

For the physical activity item (14) parents felt they could not answer confidently as many did not know how much physical activity was enough for their child. The inclusion of current guidelines ("Recommended 3 hours a day for pre-schoolers spread throughout the day. Mixed play and activities

indoor and outdoor") (Health, 2012), was recommended from parents to identify if the child's activity aligned.

Perceptions towards children's Weight and growth (items 16-17) revealed important cultural considerations. Participants were indifferent to a discussion about children's weight as they felt if the child and the caregiver were comfortable with the child's appearance, then everyone was happy. There was a strong belief among the participants that use of the BMI scale was not designed or appropriate for Pacific peoples, as Pacific peoples are genetically larger (Meredith-Jones et al., 2016)

> *"That's a fact. Tongan children, Tongan people are known to have the biggest, heaviest bones in the world. Then you put a Tongan kid on that chart, it's not fair, and it could give them a complex…." {FG3-P23}*

This is an important finding as Pacific children between the ages of 2 and 14 years of age have the highest prevalence of obesity (27.8 %), compared with Māori (21.7%), NZ European (8.6%) and Asian (7.9%) children (Ministry of Health, 2023). Data from the Pacific Island Families Study showed only 31% of parents reported they had concerns about their child's weight although 59% of the children were overweight or obese (Heimuli et al., 2011).

In regard to the item on growth and weight, Inclusion of recommendations for growth of pre-school aged children was suggested by the participants to address any confusion about the meaning of 'growing.'.

> *"Growing up as in age. That's what I would think…… For Pasifika, if we have mothers that have come from overseas, they might, be like, "Sis, what this growing mean?" In our language -growing is growing up for where I'm from" {FG5-39}*

Scoring

Most participants preferred to self-score the tool to avoid feeling judged if nutrition risk was high, and to immediately see the nutrition risk level of the child. They believed this approach would encourage honest completion and provide a better understanding of their children's health. However, incorrect score calculation suggest that support or automated calculations might be beneficial. Out of 38 pre-schoolers, 13 (34.2%) were classified as high nutrition risk, 13 (34.2%) as moderate risk, and 12 (31.6%) as low risk. Among the 38 participants, half (20) scored the tool correctly, nearly a quarter did not use the scoring, and a quarter scored incorrectly, primarily due to addition errors. These errors resulted in scores for four pre-schoolers changing from moderate to high nutrition risk.

A total of 13 (34.2%) of pre-schoolers were scored at high nutrition risk. This reinforces the need for this type of tool to identify barriers and enable timely interventions for improvement of nutrition.

Participants expressed that NutriSTEP was a 'good' tool to recognise barriers to healthy eating and were enthusiastic for further information to help make improvements for their children.

Group sessions

In the current study, participants preferred completing the NutriSTEP tool in a group setting rather than individually with a healthcare worker. A group approach provides a sense of community and relief to hear others may face similar challenges. It will also allow opportunities for discussing practical strategies, nutrition and support needs. Furthermore, group sessions may improve experiences of the Pacific community in healthcare settings especially where Pacific people feel distrust with healthcare professionals as well as prejudice when going to appointments. Such experiences leave community members feeling unwelcomed and discouraged from seeking needed care (Sumibcay, 2024). Having the support of others in group sessions may encourage members of the Pacific community to participate and complete the tool, who otherwise may not have attended.

It was expressed that family and community are important in Pacific cultures. This is a key dimension of the Fonofale health model that represent different aspects of health, relative to the 'whole health' of Pacific peoples (Fitzpatrick & Allen, 2019) . The fale symbolises the make-up of Pacific life in a way relevant to different cultural groups *(Pulotu-Endemann et al., 2017).* Group sessions can provide an opportunity to have family members and friends join in on the sessions representing one aspect to a person's "whole health".

Participants agreed they would like to see the NutriSTEP tool in their own language. This may remove one barrier to health knowledge as, it has previously been found that "patients with low health literacy can feel shame about their lack of skills or knowledge and may hide their difficulties in reading, writing or mathematics from healthcare providers, avoiding embarrassment" (Beale, 2017).

Intervention

This qualitative study provides valuable insights from the Pacific community to improve the NutriSTEP tool to become culturally acceptable. Barriers to understanding and completing the tool were highlighted, and suggestions for resources provided to assist the Pacific community to make informed health and nutrition decisions.

Strengths and Limitations

Using a co-design method for this study has given an in-depth insight of the community needs to improve health and nutrition risks for their pre-school children. As seen previously, a Samoan church-based participatory designed study found an opportunity to open up a safe space for better understanding of collectively identifying needs, analysing problems and generating solutions (Ledwith & Springett, 2010).

The co-design method adopted for this study has been key to discovering real and relevant opinions from participants about what needs to be adapted within the NutriSTEP tool and what should be included in resources going forward.

A strength of the study was using a participatory/ co-design method that was able to provide accurate amendments and information for future interventions. Secondly a strong rapport was built between interviewers and participants, and this created a safe space during group sessions for participants to 'open up' about feelings and understandings and develop a breadth of findings. Thirdly, a partnership with Pacific Heartbeat enabled the study to reach the Pacific communities that may not have been possible otherwise. Finally having an item-specific tool and moderator guide enabled detailed feedback for each item/component of the tool and made it clear what topic was being discussed.

In the creation of the study researchers formed a relationship with the Pacific Heartbeat team who played a key role in the recruitment process for the focus groups. Pacific Heartbeat had connections with community leaders involved with various groups such as early learning centres, Pacific play groups and cultural community groups etc.

All participants of the study were living in assorted areas of the Auckland region. The most represented ethnic group of the sample was I-Kiribati 21% followed by Tongan 16%, whereas the most represented Pacific population in New Zealand was Samoan 47.9% followed by Tongan 21.6% (Minisrty for Pacific Peoples, 2020). The sample size of thirty-eight participants provided a diverse range of Pacific representation.

Recommendations from the participants

Participants expressed the need for culturally appropriate resources that are understood by all health literacy levels and to address topics throughout the tool such as food groups, food budgeting/low cost healthy meal ideas, portion sizes and recommendations for physical activity and screen time available as both paper copies and online links (see table 2).

3.6 Conclusion

The present study has shown that there is value in using the NutriSTEP tool with Pacific participants to enable them to become aware of healthy food habits and learn new ways to improve the nutritional health of their children. Aspects of the tool needed amendments such as word changes and pictorials to improve clarity, provide knowledge and improve nutrition risk scores. Self-scoring the tool was preferred by participants, though they may need group support.

Modifications were identified to improve cultural inclusion such as describing the tool in each Pacific language under the NutriSTEP name... Clear suggestions were made specifically around items related to weight and growth. Pacific peoples see weight and growth through a cultural lens and strongly focus on the child overall being 'happy'.

As family and community are such a vital part of Pacific culture, the suggested group sessions will be an essential aspect of the Pacific community utilising the NutriSTEP tool. Post tool completion resources suggested in the co-design of this study will greatly assist to increase knowledge around nutrition related topics.

Chapter 4: Conclusions and Recommendations

This study aimed to assess the acceptability and use of the NutriSTEP nutrition screening tool to improve Pacific pre-schooler eating habits in a co-designed feasibility study with Pacific Heartbeat and end-use parents of Pacific pre-school children. The objectives were to collaborate with stakeholders in a co-design to assess the acceptability and use of the NutriSTEP tool as it supports the different stake holders and addresses their needs sing different types of knowledge and experiences from each participating group (Francisco et al., 2022; Slattery et al., 2020). Conduct five focus groups made up of participants from different Pacific communities to complete the NutriSTEP tool with feedback, to analyse the data to determine adaptations needed to the tool to ease acceptability and use and make recommendations for intervention initiatives to improve Pacific pre-schooler eating habits.

4.1 The study objectives were met as follows:

Objective one: Collaborate with stakeholders (Pacific heartbeat) and end-users (Pacific communities) in a co-design process with extensive discussions to plan the engagement and procedures

The objective was achieved by establishing a relationship with the Pacific Heartbeat team as a stakeholder through continuous communication during the study's planning, procedural development stages, and execution. The study used a co-design as there is a gap of knowledge around Pacific communities and implementing nutrition screening., In this case the stakeholder and end-user, which was the Pacific Heartbeat team and Pacific parents of pre-school aged children.

This collaborative effort involved aligning with the Pacific Heartbeat team regarding the study's objectives and identifying their connections within the community. Recruitment flyers, developed jointly by the Massey research team and the Pacific Heartbeat team, were distributed to Pacific community leaders, who then distributed it to potential participants. Additionally, the Pacific Heartbeat team facilitated introductions between Massey researchers and community leaders via email, which was instrumental in fostering trust prior to engaging with potential participants in community settings.

Objective two: Conducting five end-user focus groups (participants from different Pacific communities), completing and providing feedback on the NutriSTEP tool

Following the dissemination of recruitment flyers by each community leader within the Pacific community (see figure 1), eligible participants coordinated with their respective community leaders and Massey University researchers to schedule the focus groups. Consequently, five focus groups were organized across the Auckland region, representing a diverse range of Pacific community groups.

Massey University researchers facilitated a welcoming and comfortable environment for participants by providing refreshments at each focus group session. The sharing of food was intended to enhance the participants' experience by providing heart healthy food and to create a comfortable atmosphere for discussion. Parents may not be open to discussing their child's health to a 'stranger' if a comfortable relationship between themselves and the researcher/clinician has not been established. Pacific peoples are relationship-based people and need clinicians and healthcare workers that shows understanding of their needs/life to have trust established. Without this trust there may be a block to be 'open' and tell the truth (Robinson et al., 2006; Sheridan et al., 2023). Thus, the establishment of solid relationships throughout the study was key for its success.

Participants were provided with an explanation of the purpose of the focus group and the NutriSTEP tool. They were then asked to complete the tool independently and offer their feedback on all sections and aspects of the tool in the focus group sessions, using the developed moderator guide (see Appendix B10).

Objective three: Approve and determine adaptations, access and initiatives for use of NutriSTEP

During the focus group sessions, recordings were made and subsequently transcribed. The transcriptions were then imported into NVivo software for analysis. Feedback that was similar across the majority of participants was grouped together, leading to the identification of emerging themes from the discussions. The findings were compiled into a secondary moderator guide (see Appendix B11).

Final focus groups made up of 1-2 representatives from each of the phase one focus groups was established. The final groups were presented with the collated findings section by section. The representatives engaged in discussions of potential adaptations to the tool, ultimately reaching consensus on the final modifications. Following this discussion, participants made collective decisions on the desired features for resources in various topic areas, such as food groups, serving sizes, physical activity, and screen time recommendations.

Participants also deliberated on preferred methods for accessing the tool in the future. They expressed a desire to utilize the tool in group settings within their communities, such as churches, childcare centres, community hubs, and parent groups, where they would have the support of familiar and supportive environments.

Objective four: Assess the acceptability and use of the NutriSTEP tool

The acceptability of the NutriSTEP tool was evaluated based on participant feedback and suggested adaptations. Overall, the tool was deemed acceptable, with participants acknowledging it as a "good" tool that was relatively 'easy' to use. They recognized the value in using the NutriSTEP tool for assessing the health and health outcomes of their pre-school children, viewing it as a valuable step towards improving the future health of Pacific communities.

However, participants identified aspects of the tool needing changes to enhance clarity and cultural appropriateness. They expressed a desire to be 'included' in discussions about child health. Instead of a new name, participants suggested to retain the name, but to include a clear explanation of the NutriSTEP tool beneath its heading and translating it into various Pacific languages. Further specific amendments included incorporating culturally relevant examples of fruits and vegetables, such as taro and cassava, within the vegetable section. Additionally, the inclusion of pictorials was recommended to address varying levels of health literacy and language barriers. Notably, the sample group had a range of first languages spoken, including 31.6% I-Kiribati (needing a translator), 13.2% Niuean, and 5.3% for both Samoan and Tuvaluan.

Certain items required clarification to improve the accuracy of responses and, therefore, accuracy of nutrition risk scores. For instance, a growth chart for preschool-aged children to clarify the meaning of "growing", as there was confusion regarding age, weight or height as the descriptor. Moreover, participants sought guidelines on physical activity levels, expressing a need for recommendations to compare with their children's activity levels.

Objective five: Make recommendations for initiatives to improve Pacific pre-schooler eating habits.

A table of recommendations of resources and ways to reach the Pacific community to use the NutriSTEP tool had been created from the study's findings (see table 2). These recommendations emphasized the need for culturally relevant interpretations of weight and growth. It is suggested that Pacific peoples perceive these concepts through a cultural lens, valuing the overall happiness of the child over a number on the scales. Therefore, it was suggested that resources should explain the importance of monitoring weight in relation to health outcomes. and provide information on what is meant by 'growing'.

Additionally, participants requested resources that offer budget-friendly, easy-to-prepare, and healthy meal ideas for parents and families; guidelines on physical activity, screen time, food group servings, and fast food intake. The inclusion of pictorials in all resources was of high importance to making the information more accessible and improving understanding of nutrition-related topics.

As family and community are such a vital part of Pacific culture, going forward the suggested method of group sessions will be an essential aspect for engaging with the Pacific community to utilise the NutriSTEP tool. These sessions should be held in familiar and supportive settings such as mother groups, community groups, church groups, and childcare centres. If it had to be a one on one in a healthcare setting could include at GP and Plunket nurse visits, though was not the preferred option.

4.2 Strengths of research

One notable strength of the study was the use of a participatory/co-design method, which facilitated accurate amendments and the provision of relevant information for interventions tailored to a cultural context. Secondly, the establishment of a strong rapport between the interviewers and participants contributed to the creation of a comfortable 'safe space' during group sessions. This rapport allowed participants to openly express their emotions and perspectives, developing a breadth of findings. Thirdly, the collaboration with Pacific Heartbeat significantly enhanced the study's reach within Pacific communities, a demographic that might have otherwise been inaccessible. Finally, the use of a specialized item-specific tool and a detailed moderator guide provided the means for comprehensive feedback on each component of the tool.

4.3 Limitations of research

In the development of the study, researchers established a collaboration with the Pacific Heartbeat team, who played a key role in the recruitment process for this study. The Pacific Heartbeat's relationships with community leaders involved with various groups such as early learning centres, Pasifika play groups and cultural community groups, was instrumental in participant recruitment. However, this kept the recruitment process contained to the selected communities within the Auckland region only.

The study sample comprised individuals residing in various areas of the Auckland region, and is therefore not a true representation of the Pacific population in New Zealand. The most prevalent ethnic group within the sample was I-Kiribati, representing 21%, followed by Tongan at 16%. In contrast the most represented Pacific population in New Zealand is Samoan at 47.9% followed by Tongan at 21.6% (Minisrty for Pacific Peoples, 2020). Due to the nature of the recruitment process, which was constrained to Auckland-based participants, who had established connections with Pacific heartbeat. The study did not include individuals from Pacific communities outside this region. Consequently, the sample size was smaller having only thirty-eight participants, reflecting challenges in the scheduling of suitable times for all participants to commit to.

Additionally, the absence of a Pacific representative within the Massey research team hindered a deeper cultural interpretation of participants' discussions. Lived experiences of Pacific peoples would have enriched understandings of cultural outlooks on the various topics throughout the NutriSTEP tool.

4.4 Final Recommendations

This study has highlighted opportunities for further research and interventions in a community setting for Pacific pre-school aged children. Recommendations include:

- Having a researcher of Pacific background on the team and having a participant reach across and beyond the Auckland region could provide deeper understandings of the use of the tool for Pacific people in New Zealand
- Online (Zoom) meetings could be used to accommodate potential participants in areas beyond Auckland
- Plan with Pacific Heartbeat to implement the adapted tool in Pacific communities.

As family and community are a key part in the health and well-being of Pacific peoples

- screening could take place in community settings such as churches, childcare centres, community hubs and parent groups
- Tool to be completed individually though in a group session to increase support and shared experiences
- Option of a hard copy and online with scores being automatically calculated to aid addition of scores, and to avoid users changing to get a 'better' score
- Having a Pacific representative with a nutrition background to assist with interpretations of scoring and queries around weight etc. that are seen through a cultural lens.

Tool specific recommendations

- See appendix A1 for item specific amendments
- To assist in the understanding of the nutrition risk levels, the use of coloured faces with scores e.g. green smiley face next to low nutrition risk, orange neutral face for moderate nutrition risk and a red sad face for high nutrition risk
- Suggested explanation of tool under heading to be translated to different Pacific languages
- Have pictorials of food examples provided with the tool, e.g. pictures of fruit, vegetables, lentils etc.
- Pictorial guide on what a standard serving size is for all food groups
- Explain last bullet point on title page of the tool "*The word "times" in the response section refers to at least a half standard serving of food offered at a single eating occasion"* half of an adult sized plate offering

Following on from completing the tool participants would like to have culturally appropriate resources that are easy to understand related to topics in the tool such as:

- food groups, food budgeting/low cost healthy meal ideas, portion sizes and recommendations for physical activity and screen time among others to be available as hard copies as well as online links to this information (see table 2).
- The use of pictorials throughout all resources has been highly suggested
- Lay terms to be used in resources
- Resources were recommended to be provided in information sessions covering the above topics with take home hard copies/ online links of information covered
- Continue collaboration with Pacific Heartbeat to co-facilitate information sessions within the Pacific community

4.5 Conclusion

The current study has shown that there is value in using the NutriSTEP tool with enhancing awareness in participants of daily habits and in turn being enthusiastic to learn ways to improve the nutritional health of their children. Aspects of the tool were acceptable for nutrition screening amongst participants, though other aspects needed amendments as outlined above. These included word changes and pictorials for items to improve clarity, providing accurate answers and therefore more accurate final nutrition risk scores. Participants expressed a preference for self-scoring the tool; however, support may be necessary to address errors with final additions and interpretation.

Modifications were identified to improve cultural inclusion such as having an explanatory paragraph of the tool under the NutriSTEP name in each Pacific language. Clear suggestions were made specifically around items related to weight and growth. It is suggested that Pacific peoples see weight and growth through a cultural lens and shared insights as to what is important to them when discussing weight and growth of children, which was the child overall being ‘happy’.

As family and community are such a vital part of Pacific culture, going forward the suggested group sessions too will be an essential aspect of the Pacific community utilising the NutriSTEP tool. Post tool completion resources to be provided should include material suggested in the co-design of this study to increase knowledge around nutrition related topics.

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Appendices

Appendix A – Supplementary Results

Note: Sections highlighted in yellow represent suggested changes of participants

A1. Pacific amended NutriSTEP tool

NutriSTEP-Nutrition behaviour Questionnaire for Parents of Preschoolers

The NutriSTEP screening tool can help to identify what is going well and what to work on to improve your child's eating and activity habits. It only takes about 10 minutes to complete !

Instructions

- **Below are questions about your preschool child's (2-5 years-old) eating and other habits.**
- **Please complete the questions yourself or with the help of others who take care of your child.**
- **Tick (√) only one answer for each question.**
- **Think about your child's *usual* habits when answering each question.**
- **The word "times" in the response section refers to at least a half a standard serving of food offered at a single eating occasion**

1. My child usually eats bread, cereals and grain products:

Examples are bread, buns, breakfast cereals (i.e. Weetbix, porridge), pasta, rice, roti, wraps and crackers.
(pictorial guide for a standard serving of all the food groups)

- ☐ **More than 5 times a day**
- ☐ **4-5 times a day**
- ☐ **2-3 times a day**
- ☐ **Less than 2 times a day**

Q1 Scoring:
0= More than 5 times a day
1= 4 to 5 times a day
2= 2 to 3 times a day
4=Less than 2 times a day

2. My child usually has milk and dairy products:

Examples are cow's milk, flavoured milk (i.e. chocolate), cheese, yoghurt, custard, dairy foods and fortified soymilk.
(This excludes almond, rice and coconut milks and products).

- ☐ **More than 3 times a day**
- ☐ **3 times a day**
- ☐ **2 times a day**
- ☐ **Once a day or less**

Q2 Scoring:
0= More than 3 times a day
1= 3 times a day
2= 2 times a day
4= Once a day or less

3. My child usually eats fresh fruit:

(Includes fresh, frozen and canned fruit)

- ☐ **More than 3 times a day**
- ☐ **3 times a day**
- ☐ **2 times a day**
- ☐ **Once a day**
- ☐ **Not at all**

Q3 Scoring:

0= More than 3 times a day 1= 3 times a day 2= 2 times a day 3= Once a day 4= Not at all

4. My child usually eats vegetables:
(Starchy vegetables: including taro, yam, cassava and kumara – Green vegetables including taro leaves, watercress…..

- ☐ **More than 2 times a day**
- ☐ **2 times a day**
- ☐ **Once a day**
- ☐ **Not at all**

Q4 Scoring:
0= More than 2 times a day 1= 2 times a day 3= Once a day 4= Not at all

5. My child usually eats meat, fish, poultry or alternatives:
Alternatives can be eggs, peanut butter, tofu, nuts, or dried beans, peas and lentils.
   - ☐ **More than 2 times a day**
   - ☐ **2 times a day**
   - ☐ **Once a day**
   - ☐ **A few times a week**
   - ☐ **Not at all**

Q5 Scoring:
0= More than 2 times a day 1= 2 times a day 2= Once a day 3= A few times a week 4= Not at all

6. My child usually eats "fast food":
(Fast foods relates to the term "takeaways" e.g. fish and chips, burgers etc.)

- ☐ **4 or more times a week**
- ☐ **2-3 times a week**

- ☐ **Once a week**
- ☐ **A few times a month**
- ☐ **Once a month or less**

Q6 Scoring:
4= 4 or more times a week
3= 2 to 3 times a week
2= Once a week
1= A few times a month
0= Once a month or less

7. I have difficulty buying food to feed my child because food is expensive:
(Our budget doesn't allow us to buy all the food I want for my child)

- ☐ **Always**
- ☐ **Most of the time**
- ☐ **Sometimes**
- ☐ **Rarely**
- ☐ **Never**

Q7 Scoring:
4=Always
4= Most of the time
2= Sometimes
1= Rarely
0= Never

8. My child has problems chewing, swallowing, gagging or choking when eating:
(All children included)

- ☐ **Always**
- ☐ **Most of the time**
- ☐ **Sometimes**
- ☐ **Rarely**
- ☐ **Never**

Q8 Scoring:

4=Always
4= Most of the time
2= Sometimes
1= Rarely
0= Never

9. My child is **not** hungry at mealtimes **because** he/she drinks all day:
   - ☐ **Always**
   - ☐ **Most of the time**
   - ☐ **Sometimes**
   - ☐ **Rarely**
   - ☐ **Never**

Q9 Scoring:
4= Always
3= Most of the time
2= Sometimes
1= Rarely
0= Never

10. My child usually eats:

(Relates to all meals and snacks)

- ☐ **Less than 2 times a day**
- ☐ **2 times a day**
- ☐ **3 to 4 times a day**
- ☐ **5 times a day**
- ☐ **More than 5 times a day**

Q10 Scoring:
4= Less than 2 times a day
3= 2 times a day
1= 3 to 4 times a day
0= 5 to 6 times a day
2= More than 6 times a day

11. I let my child decide how much to eat:

- ☐ **Always**
- ☐ **Most of the time**
- ☐ **Sometimes**

☐ **Rarely**
☐ **Never**

Q11 Scoring:
0= Always
1= Most of the time
2= Sometimes
3= Rarely
4= Never

12. My child eats meals while watching TV or other digital devices:

☐ **Always**
☐ **Most of the time**
☐ **Sometimes**
☐ **Rarely**
☐ **Never**

Q12 Scoring:
4= Always
3= Most of the time
2= Sometimes
1= Rarely
0= Never

13. My child usually takes supplements: *Examples are multivitamins, iron drops, fish oil. (Does not include prescription supplements)*

☐ **Always**
☐ **Most of the time**
☐ **Sometimes**
☐ **Rarely**
☐ **Never**

Q13 Scoring:
4= Always
3= Most of the time
2= Sometimes
1= Rarely
0= Never

14. My child:

- ☐ **Needs more physical activity**
- ☐ **Gets enough physical activity**

(Recommended 3 hours a day for pre-schoolers spread throughout the day. Mixed play and activities indoor and outdoor e.g. Walking the dog • Biking on the flat• Playing at the park or pool •dance)

Q14 Scoring:
4=Needs more
0=Gets enough

15. My child usually watches TV, uses the computer/other devices, and plays video games:

- ☐ **5 or more hours a day**
- ☐ **4 hours a day**
- ☐ **3 hours a day**
- ☐ **2 hours a day**
- ☐ **1 hour or less a day**

Q15 Scoring:
4= 5 or more hours a day
3= 4 hours a day
2= 3 hours a day
1= 2 hours a day
0= 1 hour a day or less

16. I am comfortable with how my child is growing: *(show growth chart?)*

- ☐ **Yes**
- ☐ **No**

Q16 Scoring:
0= Yes
4= No
2= Not sure

17. My child:

(My child is regularly weighed by a health professional)

- ☐ **Should weigh more**
- ☐ **Is about the right weight**

☐ **Should weigh less**

Q17 Scoring:
4= Should weight more 0= Is about the right weight 3= Should weigh less 2= Not sure 99=no answer

TOTAL SCORE:

≤20	21-25	>25
Low Risk *Your child's eating and activity habits are good. There may be some areas you would like to work on*	**Moderate Risk** *Your child's eating and activity habits can be improved by making some small changes*	**High Risk** *Your child's eating and activity habits can be improved by making some changes*

Appendix B – Materials used

B1. Recruitment Flyer (English)

B2. Recruitment Flyer (Samoan)

NutriSTEP®

Laasaga e faatupulaia ai le alualu i luma o le taumafa i meaai paleni mo le soifua maloloina.

O oe o se matua Pasifika poo se tagata Pasifika o loo vaaia tamaiti I le va o le 2-5 tausaga?

O loo manaomia matua e auai mo le tasi itula i se faatalatalanoaga mo ni manatu ma finagalo I le polokalame o le NutriSTEP, e fesoasoani e faaitiitia ai itu le lelei e taofia ai le ai I meaai paleni.

Mo lou taimi o le a mauaina le meaalofa e $50 e faatauina ai meaai.

Saunia ai foi meaai mama mo le fofoga taumafa

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

COLLEGE OF HEALTH
TE KURA HAUORA TANGATA

B3. Recruitment Flyer (Tongan)

NutriSTEP®

Fu'u fiema'u 'aupito ho'o tokoni'

'Oku 'i ai nai ha'o fānau ta'u 2 – 5 ?

'Oku fiema'u ha kau tauhifānau ke kau mai ki ha pōtalanoa houa 'e taha felave'i mo e NutriSTEP, ko e tokoni ke fakalakalaka ange e kai mo'uilelei.

'E 'i ai e vausia me'akai pe 'utu $50 ma'a nautolu 'e kau ki he fakataha ni.

'E 'i ai foki mo e ki'i fakamāmālohi

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

COLLEGE OF HEALTH
TE KURA HAUORA TANGATA

B4. Recruitment Flyer (Niuean)

NutriSTEP®

Manako ke he haau a lagomatai

Ko e matua Pasifika nakai a koe poke tagata leveki atu ke he tau fanau 2 ke he 5 e tau moui?

Manako ke moua e tau mamatua ke fakalataha mai ke he taha fakatutalaaga fakakite manatu ke lata ma e NutriSTEP®, ko e puhala lagomatai ke tuku hifo e tau fakalavelave ke he tau puhala kai ke moua e malolo tino

Ke lata mae haau a tau magaaho to foaki atu kia koe $50

To fai mena kai mama ka oti e fekau

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

COLLEGE OF HEALTH
TE KURA HAUORA TANGATA

B5. Participant Information Sheet

School of Sport and Exercise and Nutrition
Massey University
Private Bag 102904
North Shore City
Auckland
0754
New Zealand

Feasibility of a Community Nutrition Intervention to improve Food Intake of Pre- schoolers: Co-design with Pacific Heartbeat

INFORMATION SHEET

Researcher Introduction

My name is Aimee Ngawhika and I am currently completing a Master of Science in Human Nutrition and Dietetics at Massey University, Albany campus. My thesis project involves a co-design with Pacific Heartbeat to work with parents of Pacific pre-school children to improve Pacific pre-schooler eating habits. This research project is supervised by Professors Rozanne Kruger and Carol Wham.

Project Description and Invitation

This project aims to assess the acceptability of a nutrition screening initiative to identify barriers to healthy eating among Pacific pre-schooler and develop helpful resources that can improve pre-schooler eating habit. This is a feasibility study with a focus on participatory engagement with both our stakeholder (Pacific Heartbeat team) and end-user groups (Pacific communities; parents of pre-schoolers).

Focus groups with parents/caregivers of Pacific pre-schoolers will initially explore the merits of a validated Nutrition Screening Tool for Every Pre-schooler (NutriSTEP) which is a short questionnaire to help determine any nutritional risks. Parents/caregivers of Pacific pre-schoolers will be encouraged to provide feedback on the questionnaire items to help improve the wording and interpretation.
Representatives of the parents/caregivers focus groups will be invited to a second round of discussions in the form of a workshop t to provide feedback on improvements and discuss how

barriers to healthy eating might be improved. One representative from each focus group will then attend a follow-up workshop.

You will be invited to participate in this research through community groups in which you belong.
We will provide food etc

You have no obligation… and can withdraw at any time

Participant Identification and Recruitment

This research project aims to recruit five focus groups of about ten 10 parents/caregivers with pre-school aged children. Participants will be invited from community groups known to Pacific Heartbeat.

Participating in this research will provide you with chance to have your input on a screening tool being used in the community. By participating, you will gain new knowledge around contributors to nutritional problems for pre-schoolers and be able to contribute ideas for the planning of interventions in the community to improve nutrition for pre-school aged children.

Project Procedures

Participants involved in this study will be invited to:

Attend one group focus group session of approximately one hour to discuss feedback with group members. Groups sessions will also have a team member from Pacific Heartbeat, and Massey University (dietetic student and researcher)

At the end of the focus group food will be provided using recipes from the Pacific Heartbeat cookbook to share among the participants. .

One representative from each focus group will be invited to attend a one hour follow-up workshop.DETAILS as below

At the follow-up workshop group representatives will be required to:

- Engage in guiding the final solutions for the types of interventions and supporting materials that need to be developed
- Discuss feedback from each group

Data Management

Data obtained from these sessions will be recorded and analysed.

Results of this research may be published in scientific journals or presented at conferences or seminars. No individual will be able to be identified in any report arising from the project. Your information will be treated with the same respect for privacy and confidentiality. Access to the information will be limited to the named investigators only.

Participant's Rights

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- withdraw from the study at any time
- decline to answer any question at any time
- ask any questions about the study at any time during participation;

- provide information on the understanding that your name will not be used unless you give permission to the researcher;
- be given access to a summary of the project findings when it is concluded.

B6. Participant Confidentiality Agreement

School of Sport, Exercise and Nutrition
College of Health
Massey University
Private Bag 102904
North Shore City
Auckland
0754
New Zealand

Feasibility of a Community Nutrition Intervention to improve Food Intake of Pre- schoolers: Co-design with Pacific Heartbeat

CONFIDENTIALITY AGREEMENT

I, _____ [name], agree that I will keep all information shared with me by other participants and by the researcher confidential by not discussing or sharing the information with anyone outside of this focus group. I agree that I will not reveal the identities of any of the other members of the focus group to anyone.

_____ _____
Signature of the participant Date

_____ _____
Signature of the researcher Date

B7. Participant Consent Form

School of Sport, Exercise and Nutrition
College of Health
Massey University
Private Bag 102904
North Shore City
Auckland
0754
New Zealand

Feasibility of a Community Nutrition Intervention to improve Food Intake of Pacific Pre- schoolers

FOCUS GROUP PARTICIPANT CONSENT FORM

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I understand that I have an obligation to respect the privacy of the other members of the group by not disclosing any personal information that they share during our discussion.

I understand that all information I give will be kept confidential to the extent permitted by law, and the names of all people in the study will be kept confidential by the researcher.

Note: There are limits on confidentiality as there are no formal sanctions on other group participants from disclosing your involvement, identity or what you say to others in the focus group. There are risks in taking part in focus group research and taking part assumes that you are willing to assume those risks.

I agree to participate in the focus group under the conditions set out in the Information sheet attached and that the focus groups will be voice recorded

I agree to participate in the focus group under the conditions set out in the Information Sheet.

Signature: ..... **Date:** .....

Full Name - printed .....

B8. Demographic questionnaire

Demographic Questionnaire

As part of this research, we need to ask you some questions in relation to your household, income, education, ethnicity and age. These questions relate to you and one child (aged 2-5 years old) for whom you are a parent or main caregiver. The information you provide in this questionnaire is confidential and no identifying information will be used in any publications from this study. Thank you very much for taking the time to complete this questionnaire.

1. **Participant ID number:** _____

2. **Email Address:** _____

3. **Your Home Address:**

_____ _____ _____
Street no. **Street Name** **Suburb**

_____ _____
Town/City **Post Code**

4. **Where were you born?**

Town/City_____ **Country:** New Zealand
Other, please state:_____

5. **What is your age?**
Please state:_____

6. **Your Gender?**

Male ☐ Female ☐ Other, please state: _____

7. **What is your first language?**

Please state: _____

8. What is your ethnicity?

Samoan	☐	Tuvaluan	☐
Cook Island Māori	☐	Tokelauan	☐
Tongan	☐	Niuean	☐
Fijian	☐	I-Kiribati	☐

Other, please state: _____

9. What is your highest secondary school qualification?

None ☐

NZ School Certificate in one or more subjects, ☐
or National Certificate level 1,
or NCEA level 1

NZ Sixth Form Certificate in one or more subjects, ☐
or National Certificate level 2,
or NZ UE before 1986 in one or more subjects,
or NCEA level 2

NZ Higher School Certificate, ☐
or NZ University Bursary / Scholarship,
or National Certificate level 3,
or NCEA level 3
or NZ Scholarship level 4

Other secondary school qualification **gained in New Zealand**, please state: _____ ☐

Other secondary school qualification **gained overseas** ☐

Don't know ☐

Prefer not to say ☐

10. What is your highest completed qualification?

None	☐	Nursing Diploma	☐
National Certificate level 1	☐	Bachelor	☐
National Certificate level 2	☐	Bachelor Hons	☐
National Certificate level 3	☐	Postgraduate Certificate / Diploma	☐
Trade Certificate	☐	Masters Degree	☐
Diploma or Certificate level 5	☐	PhD	☐
Advanced Trade Certificate	☐	Other, please state: _____	☐
Diploma or Certificate level 6	☐	Don't know	☐
Teachers Certificate / Diploma	☐	Prefer not to say	☐

11. How many children do you have?

Please state: _____

12. Please describe your relationship to the child in this age group:

Mother	☐
Father	☐
Step-mother or step-father	☐
Caregiver – family	☐
Caregiver – crèche/kindergarten	☐

Other, please state: _____

13. What is the child's/children's date of birth?

__ / __ / ____ (Day/Month/Year)
__ / __ / ____ (Day/Month/Year)
__ / __ / ____ (Day/Month/Year)
__ / __ / ____ (Day/Month/Year)

14. Where was the child born?

Town_____ **Country:** New Zealand
Other, please state:_____

15. Child's gender?

Male ☐ Female ☐ Other, please state: _____

16. What is your child's ethnicity?

Samoan	☐	Tuvaluan	☐
Cook Island Māori	☐	Tokelauan	☐
Tongan	☐	Niuean	☐
Fijian	☐	I-Kiribati	☐

Other, please state: _____

17. Would you like to receive a brief report summarising the main findings of the project?

Yes ☐ No ☐

If you answered YES to the above question, would you like to receive the report, via:

Email ☐ Post ☐

18. Are you willing to be contacted about future research projects within the Massey University School of Sport, Exercise and Nutrition?

Yes ☐ No ☐

B9. New Zealand adapted NutriSTEP tool

NutriSTEP-Nutrition Behaviour Questionnaire for Parents of Preschoolers

Instructions

- **Below are questions about your preschool child's (2-5 years-old) eating and other habits.**
- **Please complete the questions yourself or with the help of others who take care of your child.**
- **Tick (√) only one answer for each question.**
- **Think about your child's *usual* habits when answering each question.**
- **The word "times" in the response section refers to at least a half a standard serving of food offered at a single eating occasion**

---

18. My child usually eats bread, cereals and grain products:

Examples are bread, buns, breakfast cereals (i.e. Weetbix, porridge), pasta, rice, roti, wraps and crackers.

- ☐ **More than 5 times a day**
- ☐ **4-5 times a day**
- ☐ **2-3 times a day**
- ☐ **Less than 2 times a day**

Q1 Scoring:

0= More than 5 times a day
1= 4 to 5 times a day
2= 2 to 3 times a day
4=Less than 2 times a day

19. My child usually has milk and dairy products:
Examples are cow's milk, flavoured milk (i.e. chocolate), cheese, yoghurt, custard, dairy foods and fortified soy milk.
(This excludes almond, rice and coconut milks and products).

- ☐ **More than 3 times a day**
- ☐ **3 times a day**
- ☐ **2 times a day**
- ☐ **Once a day or less**

Q2 Scoring:
0= More than 3 times a day
1= 3 times a day
2= 2 times a day
4= Once a day or less

20. My child usually eats fresh fruit:

- ☐ **More than 3 times a day**
- ☐ **3 times a day**
- ☐ **2 times a day**
- ☐ **Once a day**
- ☐ **Not at all**

Q3 Scoring:
0= More than 3 times a day
1= 3 times a day
2= 2 times a day
3= Once a day
4= Not at all

21. My child usually eats vegetables:

- ☐ **More than 2 times a day**
- ☐ **2 times a day**
- ☐ **Once a day**

☐ **Not at all**

Q4 Scoring:
0= More than 2 times a day
1= 2 times a day
3= Once a day
4= Not at all

22. My child usually eats meat, fish, poultry or alternatives:
Alternatives can be eggs, peanut butter, tofu, nuts, or dried beans, peas and lentils.
☐ **More than 2 times a day**
☐ **2 times a day**
☐ **Once a day**
☐ **A few times a week**
☐ **Not at all**

Q5 Scoring:
0= More than 2 times a day
1= 2 times a day
2= Once a day
3= A few times a week
4= Not at all

23. My child usually eats "fast food":

☐ **4 or more times a week**
☐ **2-3 times a week**
☐ **Once a week**
☐ **A few times a month**
☐ **Once a month or less**

Q6 Scoring:
4= 4 or more times a week
3= 2 to 3 times a week
2= Once a week
1= A few times a month
0= Once a month or less

24. I have difficulty buying food to feed my child because food is expensive:

- ☐ **Always**
- ☐ **Most of the time**
- ☐ **Sometimes**
- ☐ **Rarely**
- ☐ **Never**

Q7 Scoring:
4=Always
4= Most of the time
2= Sometimes
1= Rarely
0= Never

25. My child has problems chewing, swallowing, gagging or choking when eating:

- ☐ **Always**
- ☐ **Most of the time**
- ☐ **Sometimes**
- ☐ **Rarely**
- ☐ **Never**

Q8 Scoring:
4=Always
4= Most of the time
2= Sometimes
1= Rarely
0= Never

26. My child is **not** hungry at mealtimes **because** he/she drinks all day:

- ☐ **Always**
- ☐ **Most of the time**
- ☐ **Sometimes**
- ☐ **Rarely**
- ☐ **Never**

Q9 Scoring:

4= Always
3= Most of the time
2= Sometimes
1= Rarely
0= Never

27. My child usually eats:
    - ☐ **Less than 2 times a day**
    - ☐ **2 times a day**
    - ☐ **3 to 4 times a day**
    - ☐ **5 times a day**
    - ☐ **More than 5 times a day**

Q10 Scoring:
4= Less than 2 times a day
3= 2 times a day
1= 3 to 4 times a day
0= 5 to 6 times a day
2= More than 6 times a day

28. I let my child decide how much to eat:

    - ☐ **Always**
    - ☐ **Most of the time**
    - ☐ **Sometimes**
    - ☐ **Rarely**
    - ☐ **Never**

Q11 Scoring:
0= Always
1= Most of the time
2= Sometimes
3= Rarely
4= Never

29. My child eats meals while watching TV or other digital devices:

    - ☐ **Always**

☐ **Most of the time**
☐ **Sometimes**
☐ **Rarely**
☐ **Never**

Q12 Scoring:
4= Always
3= Most of the time
2= Sometimes
1= Rarely
0= Never

30. My child usually takes supplements: *Examples are multivitamins, iron drops, fish oil.*

☐ **Always**
☐ **Most of the time**
☐ **Sometimes**
☐ **Rarely**
☐ **Never**

Q13 Scoring:
4= Always
3= Most of the time
2= Sometimes
1= Rarely
0= Never

31. My child:

☐ **Needs more physical activity**
☐ **Gets enough physical activity**

Q14 Scoring:
4=Needs more
0=Gets enough

32. My child usually watches TV, uses the computer/other devices, and plays video games:

- ☐ **5 or more hours a day**
- ☐ **4 hours a day**
- ☐ **3 hours a day**
- ☐ **2 hours a day**
- ☐ **1 hour or less a day**

Q15 Scoring:
4= 5 or more hours a day
3= 4 hours a day
2= 3 hours a day
1= 2 hours a day
0= 1 hour a day or less

33. I am comfortable with how my child is growing:

- ☐ **Yes**
- ☐ **No**

Q16 Scoring:
0= Yes
4= No
2= Not sure

34. My child:

- ☐ **Should weigh more**
- ☐ **Is about the right weight**
- ☐ **Should weigh less**

Q17 Scoring:
4= Should weight more
0= Is about the right weight
3= Should weigh less
2= Not sure
99=no answer

TOTAL SCORE:

≤20	**21-25**	**>25**
Low Risk	**Moderate Risk**	**High Risk**

B10. Moderator guide one

Focus Group Topics

Relevant Evaluation Question/Outcome/Area of interest	Questions	Probes
NutriSTEP tool overall	1. How did you feel about responding to the questions in general? 2. How did you feel about how long the tool took you to answer?	• Tell me more about what you mean by…
My child usually eats bread, cereals and grain products: *Examples are bread, buns, breakfast cereals (i.e. Weetbix, porridge), pasta, rice, roti, wraps and crackers.*	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. Considering the examples given for this question, how useful were these? How familiar are the examples given? 4. How would you feel about some other examples being provided?	• Tell me more about what you mean by… • How about [food], how do you feel about that example?
My child usually has milk and dairy products: *Examples are cow's milk, flavoured milk (i.e. chocolate), cheese, yoghurt, custard, dairy foods and fortified soy milk. (This excludes almond, rice and coconut milks and products).*	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. Considering the examples given for this question, how useful were these? How familiar are the examples given? 4. How would you feel about some other examples being provided?	• Tell me more about what you mean by… • How about [food], how do you feel about that example?
My child usually eats fresh fruit	1. How easy is it to understand this question?	• Tell me more about what you mean by…

Relevant Evaluation Question/Outcome/Area of interest	Questions	Probes
	2. How could this question be better written so it makes sense? 3. This question didn't provide any examples. How do you feel about that?	
My child usually eats vegetables	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. This question didn't provide any examples. How do you feel about that?	• Tell me more about what you mean by… •
My child usually eats meat, fish, poultry or alternatives: *Alternatives can be eggs, peanut butter, tofu, nuts, or dried beans, peas and lentils*	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. Considering the examples given for this question, how useful were these? How familiar are the examples given? 4. How would you feel about some other examples being provided?	• Tell me more about what you mean by… • How about [food], how do you feel about that example?
My child usually eats "fast food":	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. This question didn't provide any examples. How do you feel about that?	• Tell me more about what you mean by…
I have difficulty buying food to feed my child because food is expensive:	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense?	• Tell me more about what you mean by…

Relevant Evaluation Question/Outcome/Area of interest	Questions	Probes
	3. This question didn't provide any examples. How do you feel about that?	
My child has problems chewing, swallowing, gagging or choking when eating:	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense?	• Tell me more about what you mean by…
My child is <u>not</u> hungry at mealtimes <u>because</u> he/she drinks all day:	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense?	• Tell me more about what you mean by…
My child usually eats: □ Less than 2 times a day □ 2 times a day □ 3 to 4 times a day □ 5 times a day □ More than 5 times a day	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. How do you feel about the options that are available for you to tick as an answer?	• Tell me more about what you mean by…
I let my child decide how much to eat: □ Always □ Most of the time □Sometimes □ Rarely □ Never	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. How do you feel about the options that are available for you to tick as an answer?	• Tell me more about what you mean by…
My child eats meals while watching TV or other digital devices:	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense?	• Tell me more about what you mean by…

Relevant Evaluation Question/Outcome/Area of interest	Questions	Probes
	3. How would you feel about some other examples being provided?	
My child usually takes supplements: *Examples are multivitamins, iron drops, fish oil.*	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. Considering the examples given for this question, how useful were these? How familiar are the examples given? 4. How would you feel about some other examples being provided?	• Tell me more about what you mean by… • How about [supplement], how do you feel about that example?
My child: □ Needs more physical activity □ Gets enough physical activity	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. How do you feel about the options that are available for you tick as an answer?	• Tell me more about what you mean by…
My child usually watches TV, uses the computer/other devices, and plays video games:	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. Considering the examples given for this question, how useful were these? How familiar are the examples given? 4. How would you feel about some other examples being provided?	• Tell me more about what you mean by…
I am comfortable with how my child is growing:	1. How easy is it to understand this question?	• Tell me more about what you mean by…

Relevant Evaluation Question/Outcome/Area of interest	Questions	Probes
	2. How could this question be better written so it makes sense?	
My child: □ Should weigh more □ Is about the right weight □ Should weigh less	1. How easy is it to understand this question? 2. How could this question be better written so it makes sense? 3. How do you feel about the options that are available for you to tick as an answer?	• Tell me more about what you mean by…
<u>Scoring</u> Now we'll look at the scoring system for the tool. Depending on the answer that was ticked, a different number of points will be added to the total score. If the score was 20 or less than that, that means that there is a low nutrition risk. This means the child's eating and activity habits are healthy. A score of 21 – 25 means a moderate nutrition risk. This means the child's eating and activity habits can be changed in small ways to make them a bit more healthy. A score of more than 25 means a high nutrition risk. This means the child's eating and activity habits can be changed to make them more healthy.	1. How do you feel about this scoring in general? 2. How easy is it to understand the scoring? 3. How might the scoring be changed so it is easier to understand?	• Tell me more about what you mean by… • How do you feel about the term the term 'nutrition risk'?

Relevant Evaluation Question/Outcome/Area of interest	Questions	Probes
Summary	1. How useful do you feel this tool is? 2. Who would benefit from using this tool? 3. Where should it be used? 4. When should it be used? 5. How do you feel about the name? 6. How do you feel about the tool being on pen and paper? How else could it be delivered? 7. Tell me about any other thoughts you have on the tool.	• Tell me more about what you mean by…

B11. Moderator Guide two

Item	Feedback summary	Suggestions/confirmation	Resources
1. How to administer the tool	The tool is best completed either on paper in a group setting or an online option provided	How does everyone feel about this? Tell me more about why you agree / disagree.	
2. NutriSTEP name	Feedback was to keep the name, NutriSTEP in English and have an translated explanation/blurb underneath the name about what the tool is	How does everyone feel about this finding ? agree/disagree ? Suggestion… provide explanation	
3. Scoring	• Feedback there was a division in wanting to self-score – feeling motivated to see the score and make a change, then having someone else score. As it was expressed some people may want to change their score to look better • We also found the majority wanted to keep the categories how they are low, moderate and high nutrition risk • It was also found there was confusion, not knowing what the scores meant	How does everyone feel about this finding ? agree/disagree? What would the consensus be ? Suggestions provide explanation for each score …..	
4. Item 1 My child usually eats bread, cereals and grain products: *Examples are bread, buns, breakfast cereals (i.e. Weetbix, porridge), pasta, rice, roti, wraps and crackers.* ☐ **More than 5 times a day** ☐ **4-5 times a day** ☐ **2-3 times a day**	There was confusion on what a standard serving was as “times” refers to ½ and standard serving of food offered at a single eating occasion. Participants felt that may not be answering this and other food group questions correctly	How does everyone feel about this finding ? agree/disagree Suggestions - A pictorial guide for all of the food groups for a standard serving ??	If you were to have a resource for this what would that look like ?

Item	Feedback summary	Suggestions/confirmation	Resources
☐ **Less than 2 times a day**			
5. Item 2 My child usually has milk and dairy products: *Examples are cow's milk, flavoured milk (i.e. chocolate), cheese, yoghurt, custard, dairy foods and fortified soy milk.* *(This excludes almond, rice and coconut milks and products).*	Feedback – The majority found this question easy to understand with no changes needed	How does everyone feel about this finding ? agree/disagree	If you were to have a resource for this what would that look like ?
6. Item 3 My child usually eats 'fresh' fruit:	Feedback was canned fruit was a common way fruit is eaten and participants would have not included canned or frozen in the answer.	How does everyone feel about this finding ? agree/disagree Suggestion explanation/ examples of what is included	If you were to have a resource for this what would that look like ?
7. Item 4 My child usually eats vegetables:	Feedback: There was confusion around knowing if taro, cassava, yams and kumara were a vegetable As well as not knowing if those starchy vegetables are included in the vegetable item	How does everyone feel about this finding ? agree/disagree Suggestions: Provide examples under the question that include taro, yam, cassava and kumara. Pictures or just wording ?	If you were to have a resource for this what would that look like?
8. Item 5 My child usually eats meat, fish, poultry or alternatives: *Alternatives can be eggs, peanut butter, tofu, nuts, or dried beans, peas and lentils.*	Feedback – The majority found this question easy to understand with no changes needed	How does everyone feel about this finding ? agree/disagree	If you were to have a resource for this what would that look like?
9. Item 6 My child usually eats "fast food"	Feedback – Confusion on what 'fast food' means and what would be included under that term.	How does everyone feel about this finding ? agree/disagree	If you were to have a resource for this

Item	Feedback summary	Suggestions/confirmation	Resources
		Suggestions Provide explanation/ examples of what is included in fast foods	what would that look like?
10. Item 7 "I have difficulty buying food to feed my child because food is expensive"	Feedback. There were feelings of judgement and embarrassment that may lead people to lie on the questionnaire	How does everyone feel about this finding ? agree/disagree Suggestions Have an explanation underneath e.g. Our budget doesn't allow us to buy all the food I want for my child	If not what wording would help ?
11. Item 8 My child has problems chewing, swallowing, gagging or choking when eating:	Feedback – confusion if fussy eaters or children with disabilities were included in this question	How does everyone feel about this finding ? agree/disagree Suggestions Explanation underneath item: All children included Any other suggestions?/wording	If you were to have a resource for this what would that look like?
12. Item 9 My child is **not** hungry at mealtimes **because** he/she drinks all day:	Feedback - The majority found this question easy to understand with no changes needed	How does everyone feel about this finding ? agree/disagree	If you were to have a resource for this what would that look like?
13. Item 10 My child usually eats: ☐ **Less than 2 times a day** ☐ **2 times a day** ☐ **3 to 4 times a day** ☐ **5 times a day** ☐ **More than 5 times a day**	Feedback – Wanting clarity if it were only main meals or if snacking was included	How does everyone feel about this finding ? agree/disagree Suggestions: Explanation underneath – relates to all meals and snacks	
14. Item 11 I let my child decide how much to eat:	Feedback revealed expressing love through food, no changes	How does everyone feel about this finding ? agree/disagree	If you were to have a resource for this

Item	Feedback summary	Suggestions/confirmation	Resources
			what would that look like?
15. Item 12 My child eats meals while watching TV or other digital devices	Feedback - The majority found this question easy to understand with no changes needed	How does everyone feel about this finding ? agree/disagree	If you were to have a resource for this what would that look like? Screen time resource
16. Item 13 My child usually takes supplements: *Examples are multivitamins, iron drops, fish oil*	Feedback- wanting clarity if prescribed supplements are included	How does everyone feel about this finding ? agree/disagree Suggestions Add explanation underneath, does not include prescriptions	If you were to have a resource for this what would that look like?
17. Item 14 My child: ☐ **Needs more physical activity** ☐ **Gets enough physical activity**	Feedback – Confusion on how much physical activity is enough for the children's age group	How does everyone feel about this finding ? agree/disagree Suggestions: Have explanation on recommendations	If you were to have a resource for this what would that look like? Physical activity guidelines ?
18. Item 15 My child usually watches TV, uses the computer/other devices, and plays video games	Feedback - The majority found this question easy to understand with no changes needed	How does everyone feel about this finding ? agree/disagree	If you were to have a resource for this what would that look like? Screen time guidelines
19. Item 16 I am comfortable with how my child is growing	Feedback – Wanting a clear understanding of what is meant by 'growing' and how a child should be growing	How does everyone feel about this finding ? agree/disagree Suggestions: Explanation of what is growing (milestones, wording)	If you were to have a resource for this what would that look like? Growth chart ?

Item	Feedback summary	Suggestions/confirmation	Resources
20. Item 17 My child: ☐ **Should weigh more** ☐ **Is about the right weight** ☐ **Should weigh less**	Feedback – Unsure why weight is important to discuss. And how much a child should be weighing. As well as feeling like Pasifika children do not fit under the European BMI	How does everyone feel about this finding ? agree/disagree Suggestions: Explanation about why eight Is important	If you were to have a resource for this what would that look like? Resource on weight and health