EVALUATION OF THE RED APPLE PROGRAM

A healthy lifestyle Program for Disadvantaged Families & Young People Piloted in the Wide Bay Burnett Queensland, 2011 -2012

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Executive Summary

Poor nutrition and sedentary lifestyle contribute to the statistics of 7.4 million overweight Australian adults with over a third of those being obese(1). Middle age (45-64) Australians have the highest combined rates of overweight and obesity compared to other age groups. Data collected from 14,000 adults throughout Australia on National Blood Pressure Screening Day in June 2007 showed that around 35% of middle aged women and 50% of middle age men were overweight (defined as having a BMI in the 25-30 range) and it is estimated that over the next 20 years 700,000 hospital admissions and 123,000 deaths will be a direct consequence of overweight in middle aged Australians(2).

The central focus of the Red Apple Healthy Lifestyles Pilot Program was the delivery of practical activities around the topics of healthy eating, shopping, cooking, physical activities, promoting sustainable changes in health and shopping behaviours among low socio economic families and young people in regional/ rural communities by community service providers. The aims of the evaluation project were to answer the questions; how do the activities offered by the Red Apple program in the Wide Bay- Burnett (Fraser Coast & North Burnett) regions lead to;

a) increased knowledge and skills of participants to better adopt healthy eating behaviours,
b) increased participants' ability to better adopt healthy Physical Activity (PA) behaviours, and ;
c) increased parents' ability to establish healthy eating and PA behaviours in their children?

The study also aimed to identify any barriers to healthy choices adoption by participants in relation to food choices or physical activity.

The pilot project was a Department of Health Queensland funded project. It encompassed support for people who live with social disadvantage. The intervention was piloted by engaging 176 participants across at least two locations in the Wide Bay Burnett Region. The program was facilitated by workers from existing service delivery agencies that currently provide a range of programs for this target group in partnership with the Hervey Bay Neighbourhood Centre and Uniting Care Community Fraser District.

These services already operate programs and services to the client group and the program was incorporated in their broader servicing of these client groups. This community development based arrangement provided the advantage that those delivering the program have an existing relationship with the clients. Intended benefits to participants included improvements to knowledge and skills to adopt healthy eating behaviours; improved ability to adopt healthy physical activity behaviours; and increased parents' ability to establish healthy eating and physical activity behaviours among children early in life.

Community Service Providers were very positive in their reception of the Red Apple Pilot Program and in implementing healthy lifestyles information as part of an holistic approach to supporting clients as were the program recipients. The main impact that emerged from the

both the qualitative and quantitative findings was that people are now more aware of healthy food choices for themselves and their children and that together with regular physical activity, this helps to maintain a healthy lifestyle. Participants now appear to better understand the benefits of participating in regular exercise, as well as the importance of selecting healthy fresh food, eating breakfast and cooking meals at home rather than eating fast food. More than half of the participants stated they were more confident in planning and shopping for healthy meals, finding ways to buy healthier food, cooking healthy meals, preparing healthy lunchboxes for children and knowing about the suitable food for babies. Around one quarter of participants stated they were a little more confident in these healthy eating processes. The confidence level of participants has been sustained in all 5 domains after the 3 month survey and even further increases in the area of children's healthy lunchboxes increasing from 57% to 80%, and understanding suitable food for babies from 50% to 70%.

The self-reported benefits of participants involved in the program are summarized as follows:

a) improved knowledge and lifestyle skills
b) the adoption of healthy eating behaviours
c) improved ability to adopt healthy physical activity behaviour
d) increased parent ability to establish healthy eating and physical activity patterns among children early in life
e) increased self-reliance in relation to aspects of health food choices.

The key messages (behaviours) reinforced throughout the Manual, the program and its resources are based on then current (in 2011-2012 during program development) recommendations largely sourced from the Australian Guide to Healthy Eating (AGTHE), Food Plate as well as the Physical Activity Guidelines from the Department of Health and Ageing. Main recommendations for areas of improvement in program materials and the delivery focussed on:

- More multi-cultural food samples and recipes would be good for some groups such as rice based meals-to improve delivery to diverse groups
- It would be good not to have such intensive evaluation paperwork in a future program but do keep some evaluation going
- Inclusion of specific content for older people
- The program would work better and be more interesting for some young people if they were able start with the cooking.
- Simplify facilitator materials as much as possible.

1 INTRODUCTION

The central focus of the Red Apple Program was the delivery of practical activities around the topics of healthy eating, shopping, cooking, physical activities, promoting sustainable changes in health and shopping behaviours among low socio economic families and young people members in regional/ rural communities by community service providers

The aims of the evaluation project are to answer the questions how do the activities offered by the Red Apple Program in the Wide Bay-Burnett (Fraser Coast & North Burnett) lead to:

a) increased knowledge and skills of participants to better adopt healthy eating behaviours

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The pilot project encompassed support for people who live with social disadvantage. The intervention was piloted by engaging at least 176 participants across at least two locations in the Wide Bay Burnett Region. The program was facilitated by workers from existing service delivery agencies that currently provide a range of programs for this target group in partnership with the Hervey Bay Neighbourhood Centre and Uniting Care Community Fraser District.

These services already operate programs and services to the client group and the program was incorporated in their broader servicing of these client groups. This community development based arrangement provided the advantage that those delivering the program have an existing relationship with the clients.

Intended benefits to participants included improvements to knowledge and skills to adopt healthy eating behaviours; improved ability to adopt healthy physical activity behaviours; and increased parents' ability to establish healthy eating and physical activity behaviours among children early in life.

Some individuals who participate in the research project may feel competent to reshape the program to their own needs. It is therefore likely that evaluation findings will benefit future participants. The evaluation contributes to continuous quality improvement and potentially contributes to evidence to support program recognition and findings.

2 PROJECT BACKGROUND

2.1 The Regional Context and Population Profile Demographic data for the North Burnett and Fraser Coast (3)

2.1.1 North Burnett

In June 2012, the estimated resident population of North Burnett Regional Council was 10,301 persons. The population of the North Burnett Regional Council LGA decreased by 41 persons between 30 June 2011 and 2012, which was a population decline of 0.4 per cent, compared with a 1.9 per cent increase for the state.

As at 30 June 2011 in North Burnett Regional Local Government Area (LGA), 19.3 percent of persons were aged 0 to 14 years, 60.8 percent were aged 15 to 64 years and 19.9 percent were aged 65 years and over.

Table 1. Estimated resident population by age by local government area, North Burnett Regional LGA, 30 June 2011

Local government area	Populat							
	0–14		15–24		25–44		45–64	
	number	%	number	%	number	%	number	%
North Burnett (R)	1,993	19.3	965	9.3	2,278	22.0	3,045	
Queensland	887,487	19.8	625,429	14.0	1,264,341	28.3	1,119,056	25.0
North Burnett (R) LGA as % of Queensland	0.2	. .	0.2	. .	0.2	. .	0.3	. .0.4

pr = preliminary rebased **. . = not applicable**
R = Regional

Note: Based on Australian Bureau of Statistics, Australian Statistical Geography Standard (ASGS), July 2011.
Data are updated annually with an approximate delay of 12 months after the reporting period. It is anticipated the next update will be in September 2013.
Source: Australian Bureau of Statistics, *Population by Age and Sex, Regions of Australia*, 2011, cat. no. 3235.0

There are three urban centres (over 1,000 persons) in the North Burnett and two other population centres. (These figures are based on regional profile data available in 2012; 2011 Census data updates are not yet available). At the time of the 2011 Census, there were 608 persons in North Burnett Regional Council Local Government Area who stated they were of Aboriginal or Torres Strait Islander origin. These persons made up 6.0 per cent of the total population (compared with 3.6 per cent in Queensland). These numbers are typically underreported (4). Of the 608 persons who stated they were of Indigenous origin, 539 persons stated they were of Aboriginal origin, 37 persons stated they were of Torres Strait Islander origin, and 32 persons stated they were of both Aboriginal and Torres Strait Islander origin.

Table 2. Urban localities

Urban centre/locality	Estimated resident population	Area	Population density
	number	km^2	persons/km^2
Gayndah	1,820	5.8	313.8
Monto	1,166	4.7	248.1
Mundubbera	1,083	5.1	212.4
Biggenden (L)	695	2.0	347.5
Eidsvold (L)	472	2.8	168.6
North Burnett (R)	10,805	19,706.6	0.5
Queensland	4,513,850	1,734,173.9	2.6
Region as % of Qld	0.2	1.1	0.2

At the time of the 2011 Census, the region had 831 (8.2 percent of the population) persons who stated they were born overseas, and 278 (33.6 percent of the overseas born population) who stated that they spoke a language other than English at home.

At the time of the 2011 Census, there were a total of 2,764 families in the region. The family type with the largest number of families was the couple family with no children (1,385families). There were 356 one-parent families, accounting for 12.9 percent of all families in the region.

Socio-Economic Indexes for Areas (SEIFA) is a summary measure of the social and economic conditions of geographic areas across Australia (5). SEIFA comprises a number of indexes, which are generated at the time of the ABS Census of Population and Housing. In 2006, a Socio-Economic Index of Disadvantage was produced, ranking geographical regions to reflect disadvantage of social and economic conditions. The index focuses on low-income earners, relatively lower education attainment, high unemployment and dwellings without motor vehicles. Low index values represent areas of most disadvantage and high values represent areas of least disadvantage. Updated SEIFA scores based on 2011 Census data was not available from the Government Statistician at the time of producing this report.

The following table shows the percentage of the population in each quintile (one-fifth or 20 per cent of the population) according to the Socio-Economic Index of Disadvantage for the Nth Burnett as compared to Queensland. Quintile 1 represents the most disadvantaged group of persons, while quintile 5 represents the least disadvantaged group of persons. By definition, Queensland has 20 per cent of the population in each quintile.

Table 3. Quintile comparisons for North Burnett region

Local government area	Quintile 1 (most disadvantaged)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (least disadvantaged)
	— percentage of population —				
North Burnett (R)	59.5	24.0	13.3	3.2	0.0
Queensland	20.0	20.0	20.0	20.0	20.0

At the time of the 2011 Census, the region had 2,710 persons aged 15years and over whose highest level of schooling was year 11 or 12 (or equivalent), representing 34.2 percent of all persons aged 15 years and over, significantly less than 55.3 per cent for Queensland. At the time of the 2011 Census, the region had 3,445 persons aged 15 years and over with a qualification, or 42.2 percent of the population in this age group, compared to 54.2 per cent for Queensland.

At the time of the 2011 Census, the region had 582 persons in need of assistance with a core activity, representing 5.7 percent of the total population, slightly higher than the Queensland figure of 4.4 per cent. The region had 3,396 persons aged 15 years and over who stated that their total personal weekly income was less than $400, representing 41.6 percent of all people aged 15 years and over. This was significantly higher than the 34.6 per cent recorded for Queensland. The number of unemployed persons aged 15 years and over (based on a smoothed series) in the region in December quarter 2012 was 273. This represented an unemployment rate of 4.1 percent, somewhat lower than the unemployment rate for Queensland of 5.8 per cent. These figures still convey a picture of significant disadvantage, particularly in terms of educational levels and income.

2.1.2 Fraser Coast

As at 30 June 2012, the estimated resident population of the Fraser Coast region was 98,629 persons, compared with 4,560,059 persons in Queensland. The population of Fraser Coast Regional LGA increased by 1,333 persons between 30 June 2011 and 2012, which was a population growth rate of 1.4 per cent, compared with 1.9 per cent increase for Queensland.

As at 30 June 2011 in Fraser Coast Regional Local Government Area (LGA), 18.9 percent of persons were aged 0 to 14years, 60.1 percent were aged 15 to 64 years and 21.0 percent were aged 65 years and over.

Table 4. Estimated resident population by age by local government area, Fraser Coast Regional LGA, 30 June 2011

Local government area	Population by age									
	0–14		15–24		25–44		45–64		65+	
	number	%	number	%	number	%	number	%	number	%
Fraser Coast (R)	18,386	18.9	10,342	10.6	20,404	21.0	27,740	28.5	20,424	21.0
Queensland	887,487	19.8	625,429	14.0	1,264,341	28.3	1,119,056	25.0	577,785	12.9
Fraser Coast (R) LGA as % of	2.1	. .	1.7	. .	1.6	. .	2.5	. .	3.5	. .

pr = preliminary rebased . . = not applicable R = Regional Note: Based on Australian Bureau of Statistics, Australian Statistical Geography Standard (ASGS), July 2011.

Data are updated annually with an approximate delay of 12 months after the reporting period. It is anticipated the next update will be in September 2013.

Source: Australian Bureau of Statistics, Population by Age and Sex, Regions of Australia, 2011, cat. no. 3235.0

The Fraser Coast Regional Council Local Government Area (LGA) contains one or more urban centres and/or localities. The urban centre or locality in the Fraser Coast Regional Council LGA with the largest population at 30 June 2010 was the urban centre of Hervey Bay, with a population of 50,866 persons (see following table). Of the urban centres and localities within Fraser Coast Regional Council LGA, the urban centre of Maryborough had the highest population density, with 716.6 persons per square kilometre (5)**.**

At the time of the 2011 Census, the region had 3,417 persons who stated they were of Aboriginal or Torres Strait Islander origin, representing 3.6 per cent of the total population (compared with 3.6 per cent in Queensland).

Of these, 3,067 persons stated they were Aboriginal, 183 persons stated they were Torres Strait Islander, and 167 persons stated they were both Aboriginal and Torres Strait Islander. It is likely that this group will be a significant proportion of low income families in this region.

The region had 13,340 persons who stated they were born overseas (14.0 per cent of the total population). Of these, 2,460 persons born overseas stated that they spoke a language other than English at home (18.4 per cent of the overseas-born population). There were a total of 26,867 families in the region. The family type with the largest number of families was couple families with no children (12,991 families). There were 4,655 one-parent families, accounting for 17.3 per cent of all families in the region.

Table 5. Estimated resident population by urban centre/locality, Fraser Coast Regional Council, 30 June 2010 (Localised data updated with 2011 Census information is not yet available)

Urban centre/locality	Estimated resident Population number	Area km2	Population Density persons/km2
Hervey Bay	50,866	71.5	711.4
Maryborough	23,147	32.3	716.6
Booral	1,754	28.0	62.6
Toogoom (L)	1,486	9.6	154.8
River Heads (L)	1,399	24.0	58.3
Howard	1,253	8.6	145.7
Glenwood (L)	1,248	51.9	24.0
Burrum Heads	1,176	3.2	367.5
Sunshine Acres (L)	917	14.4	463.7
Oakhurst (L)	795	12.4	64.1
Pacific Haven (L)	722	25.4	428.4
Aldershot (L)	639	8.5	75.2
Tiaro (L)	524	3.4	154.1
Torbanlea (L)	419	3.2	130.9
Boonooroo-Tuan (L)	413	16.6	24.9
Poona (L)	399	4.0	99.8
Maaroom (L)	278	53.8	5.2
Fraser Coast (R)	102,080	7,116.7	14.3
Queensland	4,513,850	1,734,173.9	2.6

The Fraser Coast is slightly better positioned than the North Burnett with regard to SEIFA scores of relative disadvantage. The following table shows the percentage of the population in each quintile (one-fifth or 20 percent of the population) according to the Socio-Economic Index of Disadvantage, for the Fraser Coast Region:

Table 6. Percentage Quintiles for the Fraser Coast Region.

Local Governmen Area	Quintile 1 (most disadvantaged)	Quintile 2	Quintile 3	Quintile 4	Quintile5(least disadvantaged)
	- Percentage of population -				
Fraser Coast (R)	48.9	33.1	8.2	7.1	2.7
Queensland	20.0	20.0	20.0	20.0	20.0

In 2011, the region had 28,920 persons aged 15 years and over whose highest level of schooling was year 11 or 12 (or equivalent), representing 39.0 percent of all persons aged 15 years and over, compared with 55.3 percent for Queensland. There were 37,881 persons aged 15 years and over with a qualification, or 49.1 per cent of the population in this age group, compared with 54.2 per cent in Queensland. The region had 7,841 persons in need of assistance with a core activity, representing 8.2 per cent of the total population, compared to 4.4 per cent for Queensland and there were 35,528 persons aged 15 years and over who stated

that their total personal weekly income was less than $400, representing 46.1 per cent of all persons aged 15 years and over, and considerably higher than the 34.6 per cent for Queensland.

The number of unemployed persons aged 15 years and over (based on a smoothed series) in the region in December quarter 2012 was 3,980. This represented an unemployment rate of 9.0 percent. In comparison, Queensland had a smoothed unemployment rate of 5.8 percent. While the Socio-Economic Index of Disadvantage is not yet available based on the 2011 Census data, the above factors would indicate that the Fraser Coast is still a region of considerable social disadvantage.

In terms of evaluation, the demographics does present some challenges, as it means that the target group for various courses or activities may vary, and the actual content delivered and course duration may also vary according to the broader service setting in which each activity occurs. These demographics confirm program assumptions about the general level of disadvantage for the Fraser Coast and North Burnett Regions, particularly in relation to income and lower levels of education. In terms of evaluation, they provide some baseline information against which we can assess the representativeness of our program participant group in relation to regional disadvantage.

2.2 LITERATURE REVIEW

The Literature Review sought to address four main questions:

a) What factors influence nutrition and physical activity choices for low income families?
b) What are the barriers preventing low income families from engaging in healthy lifestyle and nutritional choices in the Wide Bay Fraser Coast Region?
c) What types of interventions have been successful in positively influencing nutrition and physical activity choices for this target group, and
d) What are common key components that contribute to this success?

2.2.1 Limitations to existing literature

There is a paucity of literature by Australian authors in relation to the impact of barriers such as socioeconomic income and literacy levels on nutritional choices and purchase among low income earners in Australia. As a result much of the literature reviewed here is from an international perspective however it relates directly to the demographics of the region currently under study. The Literature search was conducted using keywords including; *nutrition, healthy lifestyle, food choices, low income, education, food shopping*; *physical activity,* in various combinations. Search engines used included CINAHL, EBSCOHOST MEGAFILE PRIMER.

Broader web searches were also undertaken with key words including *Community Based Social Marketing, evaluation, nutrition and healthy choices programs; interventions, obesity,*

public health, physical activity. Relevant web pages such as Department of Health Queensland, Vic Health, www.cbsm.com and "Tools for Change" were also sourced. Added to the search were ABS demographic data and social indices relating to the Fraser Coast and North Burnett. Searches also included consideration of current regional and local government planning documents for reference to healthy lifestyle objectives. Main concepts emerging from the literature review were; factors affecting food and lifestyle choices of low income families, perceptions in relation to food choices and healthy lifestyles, motivation to change; barriers to healthy choices and links between policy and healthy lifestyles.

2.2.2 Physical activity

Most studies about physical activity use self-reporting where perceptions of physical activity can affect results (6). Many studies present cross sectional data with comparison to national standards and data may not include all domains. For example the data collection tool for Australia does not measure work related activity (7). A further limitation in comparing data is simply that of definition which may vary not only across countries but also within country. For example in Australia remoteness and rurality differ according to the classification used and even within classification the category of remoteness is not specific enough to differentiate between property and town residents. Simply stated prevalence surveys have different methodologies and different rigour and comparison should be made with caution (8). One objective of this current evaluation and the following literature review is to collate and present the current evidence on physical activity in the rural context. The literature and the accompanying research will provide evidence that may be used to offer meaningful and contextual intervention for healthy choices and physical activity for rural communities in Queensland. Much of the physical activity component of this review is based on one previously undertaken for Department of Health Queensland (6).

The consensus from the literature is that physical activity has declined in the recent past, however as will be seen from papers cited below this may be argued. Nevertheless the environment in which we live has certainly changed and factors that may contribute to a change in physical activity include:

- Changes in family structures and dynamics, and play time with children
- Growth of labour-saving devices and decline in incidental exercise
- Less physically active occupations because of automation
- Increased use of cars, decreasing active travel and use of public transport
- Concerns about road safety, reducing cycling and walking
- Concerns about personal security, resulting in home-based activities
- Attractiveness of television, videos and computer games
- Decrease in physical activity education and opportunities in schools.

A 2008 discussion paper produced by the National Preventative Health Taskforce lists as its recommendations to tackle obesity:

"*Embed physical activity and healthy eating in everyday life through school, community and workplace programs*" and "*Reshape urban environments towards healthy options through consistent town planning and building design that encourage greater levels of physical activity and through appropriate infrastructure investments (for example, for walking, cycling, food supply, sport and recreation*" (9).

Recommendations as to what physical activity is required are similar across countries (e.g. UK, New Zealand, Australia and USA). The general health benefits for adults are based on 30 minutes of moderate intensity physical activity on five or more days per week (10-13).The UK Government set a target for 70% of England's population to meet this guideline by 2020(14). However they admitted that the required yearly 2% increase may be unachievable (13) especially as the most successful countries of Finland, Canada and New Zealand only achieved around a 1% increase. Interestingly no targets were set for Wales or Northern Ireland (15) and the Scottish Health Executive set a more moderate target of 50% of the adult population under the banner of "Let's Make Scotland More Active" (16) .

Recommendations differ for children, adolescents, adults and older adults. Within these age groups modifications also exist. For example in Australia a two-step process is recommended for adults whereby to achieve *greater health and fitness benefits* an additional vigorous activity for a minimum of around 30 minutes, three to four days a week is recommended (17).

The *AusDiab* Study showed that sedentary behaviour such as television viewing time even among those who meet physical activity guidelines is positively associated with metabolic risk factors (18, 19). Authors conclude that guidelines are required not only for physical activity but also for inactivity. Currently these only exist for children who, in addition to at least 60 minutes of moderate to vigorous intensity physical activity per day, should not spend more than two hours using electronic media for entertainment during daylight hours (20).

2.3 The incidence and prevalence of physical activity

2.3.1 Demographic factors influencing physical activity choices

Physical activity is associated with demographic factors including age, sex, socioeconomic status, education, ethnicity and geographic location. This section illustrates these associations between demographic factors and physical activity using Australian studies when possible.
Data published in April 2009 report on a 32 country study on the effects of age and sex on physical activity levels among 11-15 year olds and the relationship between meeting physical activity guidelines and socioeconomic status (SES) and sedentary behaviour (21). There was consistency among countries. The most active countries were Ireland, Canada, and United States, the least active Belgium and France. Older children were less active than younger children and girls less active than boys. SES was significantly associated with the amount of reported physical activity overall.

Demographic associations are well illustrated in Australia by the work of Stratton at the ABS. Short odds ratios were calculated for Australian children's participation in sport outside of

school from data collected in the Survey of Children's Participation in Selected Culture and Leisure Activities (22). The base was an 8-11 year old child living in NSW with at least one parent employed and in middle SEIFA quintile. Unemployed parent, overseas birth of parents or child, sex (female), low SES, and residence in Queensland or ACT were all major factors associated with lower comparable physical activity. Within the highest SEIFA quintile, both parents employed, participating in cultural activities, bike riding or skate boarding and residence in Western Australia were associated with higher comparable participation.

Within Australia CALD communities have been identified as low participation groups (110, 146-148). Variability has been shown among different ethnic groups with those from North-West Europe having the highest participation rate (67.4%) and those from South and Eastern Europe (42.5%) and North Africa and the Middle East had (31.2%) the lowest (23). Participation of females from North Africa and Middle East was as low as 19.1% and while some authors have stressed the importance of sex in participation of cultural groups (24-26), others suggest that there is little evidence for this (27).

Australian studies have shown that language may play a role in participation. Among *no English* and *some English* participation was 17.5% and 53.2%, respectively (28). Females speaking a non-English European language and males speaking a non-European language participated less in organised sports (29) and children born overseas or born to parents whose country of birth is non-English-speaking also had low participation (30).

2.3.2 Indigenous Australians

ABS survey data reported by the AHIW show that Indigenous Australians are more likely than non-Indigenous Australians to be sedentary or to exercise at low levels (7, 30-32) Specifically the data show that Indigenous Australians over 15 years of age were 1.6 percent more likely to report sedentary levels of physical activity compared to the general population. The trend for sedentary or low levels of exercise increased to 75% from 68% from 2001-2005 whilst exercising at moderate/high levels had dropped to 24% from 32%. Age and sex effects are also seen with rates of little or no physical activity increasing with age from 67% of people aged 15–24 years to 85% of those aged 55 years and over. Inactivity is higher among females than males (82% vs. 67%). Sedentary Indigenous Australians were more likely to report poor health, to smoke, to be overweight and have chronic health conditions. Despite difficulties in data collection they note that a lower proportion of Indigenous persons (34.6%) participated in three or more times weekly exercise, recreation and sport in 2006, compared to non-Indigenous persons (42.9%) (29).

2.4 Factors influencing nutrition and physical activity choices for low-income families

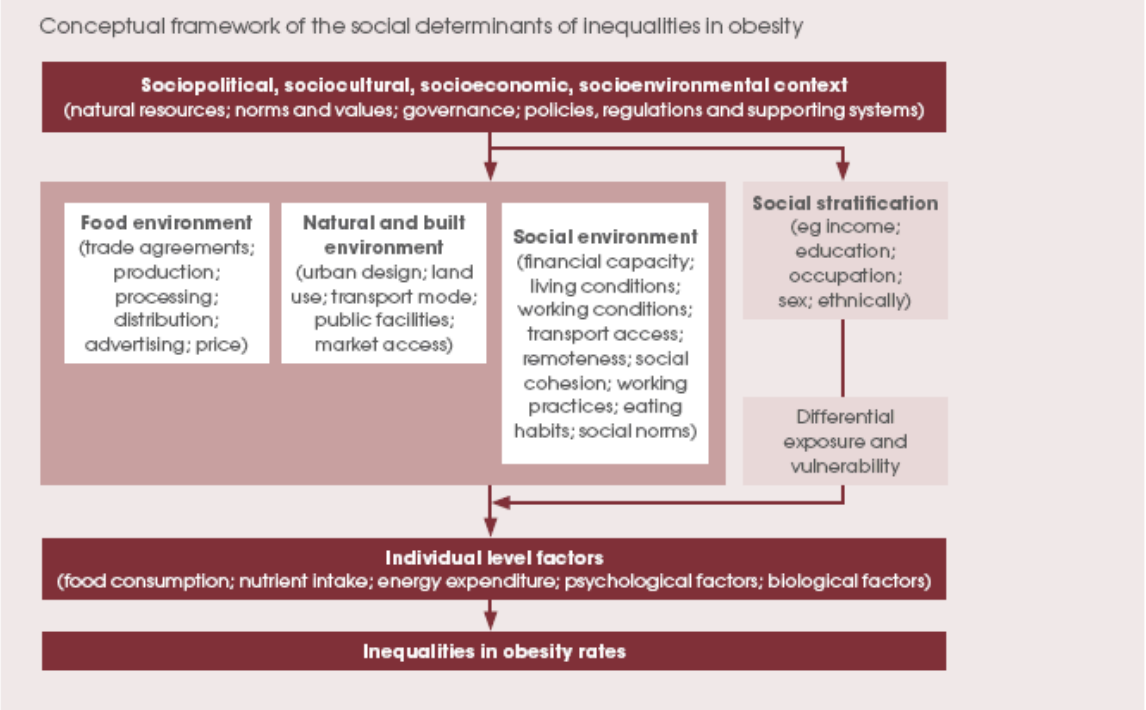
The extent of chronic disease in Australia is well illustrated by a recent Australian Institute of Health and Welfare (AIHW) publication which reports that over half a million person years of full time employment are lost per year as a result of chronic disease (33). Australian data from 20 local government areas showed that residents living in the most deprived neighbourhoods were less likely to jog or be active at recommended levels, even after controlling for individual SES (34). However swimming and cycling rates were not associated with SES. In contrast in Perth no association was found between SES and physical activity (35, 36). Although no rural specific data were reported Australians in the lowest SEIFA quintile had the lowest rate of participation in sports and physical recreation (55%) followed successive by quintiles (62%, 66%, 71% and 78%) (37).

McClelland suggests that little information exists about the validity, reliability and sensitivity to change of measures used to assess the impact of nutrition education on low income audiences of adults and adolescents. She suggests that a need exists for additional development and evaluation of dietary quality measurement tools for low income and minority audiences (38).

Attitudes to physical activity and even to what constitutes physical activity or is acceptable as physical activity environment are influenced by ethnicity and cultural background (24, 39). Culture can result in physical activity being considered to be unnecessary (24). Some CALD communities may consider work to be a substitute for physical activity (40), while others place priority on education as opposed to recreational and leisure activities (41).Van Duyn noted, in reference to Native Hawaiian and Hmong groups, being active was a natural way of life and having to purposefully think about being active seemed to be a strange concept (42).

The effect of social structure on inequalities in the distribution of weight is suggested by epidemiological trends and patterns of obesity, illustrated below in Table 7(43). Poor nutrition and sedentary lifestyle contribute to the statistics of 7.4 million overweight Australian adults with over a third of those being obese (31). Middle age (45-64) Australians have the highest combined rates of overweight and obesity compared to other age groups (2). Data collected from 14,000 adults throughout Australia on National Blood Pressure Screening Day in June 2007 showed that around 35% of middle aged women and 50% of middle age men were overweight (defined as having a BMI in the 25-30 range) and 30% of each sex are obese (BMI > 30) (44). It is estimated that over the next 20 years 700,000 hospital admissions and 123,000 deaths will be a direct consequence of overweight in middle aged Australians (2).

Table 7. Conceptual framework of social determinants of inequalities in obesity



Lack of physical activity is reported to account for 6.6% of the burden of disease and is the fourth highest after tobacco, high blood pressure and obesity (1). The direct health care cost is estimated to be $1.5 billion per year (45) which equates to 0.15% of GDP (46). In the most recent publication from the Women's Health Study (47) lower physical activity overall was associated with higher health care costs. Health costs were lower for overweight active women than for healthy-weight sedentary women. At the population level these data suggest that there would be significant cost savings if sedentary mid-age women could achieve at least 'low' levels of physical activity (60-150 minutes a week).

A review of epidemiological data 2000–2003 shows that physical activity confers a positive benefit on health and reduces risks of ill health (48). Results of that study reinforced the existing conclusions that physical activity does reduce the risks of cardiovascular disease and diabetes and can reduce the incidence of some cancers, most notably colon and breast. Furthermore both chronic diseases that impart the greatest work place loss of time (arthritis and depression) can be positively supported by an active lifestyle (49, 50). Improving diet and intake of food and increasing physical activity remain the healthiest and least risky ways of losing weight. It is predicted that a loss of 5kg would result in 34% fewer deaths and 10kg would result in 56% less deaths each year in Australia (2). Every 1% increase in the proportion of adults that are physically active would result in a yearly saving of $8m (51).

A healthy diet including fruit and vegetables is considered by nutritionists and health providers to be needed in order to sustain healthy lifestyle and to reduce the risk of cardiac disease and cancers (52). In areas of low socio economic income this level of nutritional intake is variable and impacted upon by factors such as income, education and access. This is

borne out by authors such as Dibsdall et al.(53) who explored the beliefs and experiences pertaining to food and health and identified that irrespective of the healthfulness of their diet many participants in their study showed a lack of motivation to change their eating behaviours. They suggest that those providing nutritional advice or education should be fully aware of the egocentric and/ or value systems of those they are trying to reach and not assume that all will adapt (p 308). These findings reflect those of Turrell et al. and others who found a link between socioeconomic indicators and food purchasing in that those from disadvantaged backgrounds were less likely to purchase foods such as those high in fibre, low in fat, salt and sugar (54-57).

Mayo and Rainey (2001) compared nutritional beliefs and practices of older women from two vantage points–that of health professionals who work with this target group, and the older women themselves (58). The result is very revealing identifying behaviour maps showing predisposing factors enabling factors and reinforcing factors affecting food and supplement choices. There was variance in opinions about the best delivery and format for nutrition programs from the two groups.

Unhealthy diets and inactivity are risk factors for obesity but also underpin other adverse outcomes in relation to both physical health and well-being. However, there is very low awareness of these links (59, 60)). External influences contribute to the setting of social norms and, alongside peer pressure, can contribute to a vicious cycle of poor food habits. Children want to be accepted and belong to their peer group through their choice of food as much as their choice of clothes or music. In a study by Barnardo's (61), children expressed positive views of images of children who were eating burgers and negative views of images where children were eating healthy food (62). Blake and Bisogni (63) undertook an interpretive study in New York County to develop an understanding of personal and family food choice schemas among low to middle-income women (64) and found that there are personal and family food choice schemas characterised by food meanings (beliefs and feelings about foods) and behavioural scripts (behavioural plans for regularised food and eating situations (p.282). Four personal food choice schemas emerged: dieter, health fanatic, picky eater, non-restrictive eater and inconsistent eater. Four family food choice schemas also emerged: peacekeeper, healthy provider, struggler, partnership. The study, while limited, does inform understanding of the complexity of factors at the personal and interpersonal level that influence food choice behaviours.

Similarly, Kaiser et al. (65) explored the perspectives of low income families in 2 rural Wisconsin (USA) counties about the factors that influence their physical activity and eating patterns. They found that individual, social and community influences on behaviour were supportive but suggested that barriers included factors such as lack of motivation and lack of knowledge. Findings of these researchers support the importance of multilevel approaches to promoting healthy lifestyles in rural, low income adults (p43). Smith et al. supported these findings suggesting that evidence based exercise programs can improve the fitness of adults in low income areas in USA (66).

Examination of data from the US National Health and Nutrition Examination Survey 1999-2002 (67) found that low income adults eat less fruit, vegetables, milk, meat poultry and fish than those with a high income. Similarly Dutram & Bowman found that older minority women were in urgent need of food assistance and nutrition intervention. She suggested that lack of money and food cost, inability to shop, cook or feed on their own and eating alone as well as loss of teeth, social isolation and poor health were issues for older persons.

Across all age groups, Bowman found, that 7.9% of those in low income groups were food insecure without hunger and 6% were food insecure with hunger. The causes were identified as being; availability of food outlets with healthy foods, transport and mobility, poor health and disability, housing costs. It was also noted that total fat and saturated fat intakes were over guideline levels in all population groups. These findings have relevance for the current study in rural areas of low socioeconomic income population. Life stage/status changes-in this case the transition to motherhood, was associated with positive change in some food choice behaviours, regardless of income levels (68). However, similar to other research findings, this study found that the income groups varied significantly in their intake of fruit and vegetables, both before and after pregnancy. Women making this transition for the first time showed the most consistent positive changes. The findings indicate that pregnancy and immediate postpartum periods provide opportunities for interventions to have significant impact on nutrition behaviours.

In South Carolina (USA), a program to help older, low income women bring their food choices into closer alignment with recommendations for healthful eating brought together a broad-based partnership of agencies to assist with formative evaluation, program design and delivery. The program concluded that nutrition interventions must be based on the ecological approach including behavioural & organisational change, with 5 levels of influence: intrapersonal, interpersonal, institutional or organisational, community factors and public policy factors. The authors' state:

> *"Successful interventions are based on a clear understanding of targeted health behaviours and their socio-environmental context. They are developed and managed using theoretically based planning models and are continually monitored and improved through program evaluation. Successful programs incorporate multi-modal interventions and include advocacy, organisational change efforts, policy development, economic supports, and environmental change in addition to the educational activities"*(69).

Kaiser & Bauman (65) found that people with healthier behaviours were distinguished from those with less healthy behaviour by higher levels of intrapersonal, (knowledge, skills, attitudes, behaviours), interpersonal (social networks and support systems) and community supports such as resources and physical environment (eg: access to walking trails). The study also found that perceived safety may be an inhibiting factor for physical activity for people with low self-efficacy, but fewer salients for those who are confident of their ability to be active and who perceive few barriers. Personal and environmental factors such as knowledge

and access to, affordability of fruit and vegetables may constitute particularly important influences on fruit and vegetable consumption in the rural, low income population (p.74). These results support the importance of multi-level approaches to promoting healthy lifestyles.

Lawrence et al. explored influencing cultural factors in relation to health and diet choices in a study of young women and girls from ethnic minority groups in the UK (70). They showed that all ethnic groups took time, price, health and availability into consideration when making food purchases. There were some differences in cultural norms and traditions (such as requirements for Halal) which impacted on food purchases. Disturbingly, all groups were quite similar in their use of "Western" foods, which tended to be of the fast food variety. There was some indication that many of the study group did not have skills or knowledge about the preparation of western foods they are not familiar with, which may go some way towards explaining their preference for fast foods.

In their comparative study of at risk Latino women (receiving community health intervention, and receiving Community Health as well as a community-based lifestyle intervention, in terms of BMI reduction and other health risk factors), Dreiling et al.(71) identified that the value of integrated clinical and community-based programs, particularly for low-income populations, where neighbourhood characteristics can have a major impact on weight.

2.4.1 Physical activity and health of Indigenous Australians

The rationale for increasing the focus on physical activity among Aboriginal and Torres Strait Islander people is compelling. In 2004–05, information was collected relating to the frequency, intensity and duration of exercise undertaken by Aboriginal and Torres Strait Islander people living in non-remote areas. The proportion of Aboriginal and Torres Strait Islander people in non-remote areas who were sedentary or engaged in low-level exercise in the two weeks prior to interview was higher in 2004–05 (75%) than in 2001 (68%)(72). In 2001 around 43% of Aboriginal and Torres Strait Islander adults living in remote areas reported no leisure-time physical activity, compared to about 30% of other Australians in the same areas (73). Recreation, fitness, sports, active living, access to parks, arts and culture all contribute to social and emotional wellbeing, enhanced quality of life, fine motor skill development, overall health and weight control (74).

2.4.2 Barriers to behaviour change in relation to healthy choices

Turrell et al. (75) suggest that education providers must be sensitive to the barriers for this low socio economic income group and the difficulties imposed by circumstances. Similarly, Lucan et al. stated that promoters and barriers for poor African Americans differed according to gender and age, identifying that taste was a promoter while cost was a barrier for most participants in their study (76). According to Dutram et al., who explored nutritional issues in relation to elderly in Maine USA, it:

> " *is notable that the nutritional risk categories themselves are interrelated. Polypharmacy may impact the amount of household money left over for buying*

food. Having an illness or chronic condition is expected to influence the number and types of foods eaten, possibly explaining why some report eating few fruits, vegetables or dairy products. Tooth or mouth problems also impact number and types of foods eaten, as does being physically unable to prepare foods. In Maine, poverty and geographic isolation are associated, especially among the elderly. Having a chronic disease condition or illness may also be associated with unwanted weight loss or gain.

This interrelatedness of nutritional risk factors, and of the nutritional risk factors to overall health, also points to the complexity of designing and delivering effective interventions"(77).

However, by contrast, a systematic review (78) of low income parents showed a "strategic adjustment" to poverty: going without "proper" meals some nights, shopping around for low prices, buying what kids like to avoid waste; transport was also an issue. Social and emotional factors such as the "good mother" and keeping up appearances-food is an important aspect of social inclusion, so, for example, there is poor uptake of free school lunches to avoid stigma (77). This importance of inclusion and peer pressure is also supported by the systematic review of children's perspectives. These reviews found that many mothers do understand basically what constitutes a good meal and feel bad that they are unable to provide this to their children. Making healthy choices a "moral" issue can just add to the sense of inadequacy for those whose circumstances make these choices difficult. These are clearly factors to be considered in designing interventions for low-income populations.

Other barriers identified include the relocation of supermarkets from inner urban areas, the proliferation of fast food outlets in these locations, marketing by the fast food industry targeted at these cohorts (79). Government agricultural subsidies are structured to support the needs of the fast food industry; they are effectively protected from aspects of food labelling laws (79).

Prices influence behaviour and choices, particularly among those on lower incomes, pensioners and the unemployed. Low income should not be a barrier to participation in physical activity or access to healthy food options (80).

Poorer families, the elderly and Indigenous people are more likely to live in the outer suburbs, and more likely to live in depressed rural communities with poor or ageing physical activity infrastructure. Poorer members of the community are further disadvantaged.

Transport policy and urban planning that is dominated by the car (rather than public transport, walking and cycling). Urban planning that fails to provide for accessible physical activity, sport, recreation, walking and cycling, the high cost of physical activity, recreation and sport (80).

Freeman argues that factors such as these keep fast food prices artificially low, and hence very available to the poor (79). These arguments are based on the US situation, but one can

see parallels with Australian metropolitan areas. While possibly the conclusions may not directly relate to the current project it does highlight the need to consider structural barriers to food choices. It appears ironic that in some Australian rural areas actually producing fruit and vegetables, fresh fruit and vegetables are less available and more expensive than in urban areas, due to the distribution practices dictated by the major supermarket chains.

A study of changes in the cost and availability of a standard basket of healthy food items (the Healthy Access Basket [HFAB]) in Queensland in 1998, 2000, 2001 and 2004 (81) indicated that cost and availability are barriers for rural and remote communities. In Queensland in 2004, the mean cost of the HFAB was $395.28 per fortnight. The cost was 29.6% ($113.89) higher in "very remote" areas than in "major cities". Between 2001 and 2004, the Queensland mean cost of the HFAB increased by 14% ($48.45), while in remote areas the cost increased by 18%. The cost of healthy foods has risen more than the cost of some less nutritious foods, so that the latter are now more affordable (81).

In terms of this study's definitions, most Wide Bay Burnett locations would be considered "Inner Regional" and "Outer Regional". For this category, the cost of fruit, vegetables and legumes increased from 2001 to 2004 by 19.2% and 22.5% - the highest rises. (p.12) *Table 5: Number of missing HFAB items from a total of 44 foods in the 81 stores surveyed between 2000 and 2004, by remoteness* (p.13) shows an average of just over 1 for inner regional centres, but outer regional centres had an average of nearly 6 missing items in 2000, down to an average of 3.5 items in 2004.

Winter reports on an ongoing study by Dunifon (82), which uses a survey tool within schools to gain more detailed data about food insecurity in specific locations (83). The resulting data provides useful feedback for improving school breakfast and lunch programs and factors affecting the take-up by eligible families.

Researchers suspect that food security is influenced by several community factors such as accessibility to, and use of, federal nutrition programs like school breakfasts and food stamps, access to supermarkets and other retail food outlets, availability of emergency food, local costs of food and housing and the availability and quality of jobs in the community.

Cigarette smoking was found to be a factor associated with food insecurity in America (84) with smoking prevalence being higher among low-income families who were food insecure (i.e., having insufficient funds to purchase enough food to maintain an active and healthy lifestyle) compared with low-income families who were food secure (43.6% vs. 31.9%). Similarly, an Indian study explored the interrelationship between nutrition, socioeconomic factors and lifestyle. Whilst their study focused on a very particular sub group (cataract patients), it did confirm the findings of other studies identifying differences between low-income and high income groups in the consumption of salads, milk and fruits (85).

Chang et al.(86) suggested that barriers include lack of personal time, or time generally-either ate only 1 large meal or snack all day on convenience foods; exhaustion, lack of time for exercise; preferences and expectations of other family members-don't like salads, want meat,

cheese; lack of encouragement; finances- healthy foods are perceived as expensive, don't like taste of low fat foods; perceived lack of control due to " genetics"; women 'treat" themselves to high fat sugary foods at night when children are asleep, while watching TV (87).

Studies of pregnant and postpartum Latino women to determine the role of social support in healthy lifestyle choices (88) considered social support to be emotional, informational and instrumental (practical) in nature. It was found that husbands and some female relatives were the primary sources of support, but could also be judgemental. Absence of mothers, other female relatives, and friends to provide childcare, companionship for exercise, and advice about food were prominent barriers limiting ability to (84) maintain healthy practices after pregnancy.

Geographic distance was a primary reason for cohort being separated from female-centred networks which interrupts the transmission of health-related beliefs and behaviours(89). Researchers also found that participants are influenced by relatives and friends-about diet and preparation of foods, also husband's preferences and traditional cultural beliefs, and that they buy fewer healthy foods when money is tight. Both eating & physical activity patterns were influenced by cultural beliefs and family rituals concerning safe and appropriate foods and physical activity during and after pregnancy. The findings suggest the importance of family-based interventions, with a focus on social support, if we are to influence healthy lifestyle choices and behaviours.

2.4.3 Perceptions influencing choices

Personal perceptions, whether based in culture or life experience, can impact on choices regarding diet. A study of low income Latino mothers about perceptions of body image and dietary choices for themselves and their children (90) found that all women selected a relatively thin body image as the most desirable, attractive, fit and healthy. Body size dissatisfaction or wish to be thinner, was significantly associated with more healthful diets. However, participant perceptions about their children were that children at the 50^{th} and 75^{th} mean BMI for age percentiles were too thin to be attractive or healthy and the one third of children above the 97^{th} percentile only barely too large. It is unclear whether cultural or other factors account for this. Mothers with the highest BMI's make the least healthful choices for their children. Women had reasonably accurate judgements about their body image, but none perceived themselves as being at risk for heart disease although58% were overweight or obese,

A qualitative study of 80 low-income, overweight and obese mothers (87) in the USA identified appearance, fitting into clothes, physical ability to keep up with kids and social support as motivators for healthful eating and physical activity, while barriers included: focussing on children's needs first, slowness of results regarding weight loss, poor self-efficacy (giving up or relapse during weight loss). The study also highlighted the need to take emotional responses and stress into account in designing interventions for this target group. Responses to stresses like loneliness, boredom and isolation often include unhealthy foods. Being overweight decreased self-esteem and these women had reduced social contact.

Thompson and Fitzpatrick researched the relationship between temporal perspective and positive health practices in low income adults. Temporal perspective is the perceived relationship between past, present and future(91). There is a generally held belief that people living in poverty are present dominant, so have difficulty attributing diet and exercise behaviour change to future benefits. Using the Circles Test (92) to measure temporal perspective, they found that while 43% expressed a future temporal dominance, 80% expressed non-continuous temporal relationship. From this one can extrapolate that, for this sample, they may not believe that adopting healthy practices will influence future health. Despite this, the sample had similar levels of positive health behaviour choices to other target groups from other studies (93).

2.4.4 Links between policy and health community choices

In a study of the impact of federally mandated local wellness policy on physical activity in rural schools in a low income area of Colorado (USA) (94) researchers identified several barriers to the impact of the policies including competing pressures among school districts, lack of resources for the policy, principal's lack of knowledge about the policy, and lack of accountability mechanisms to ensure policy implementation. They suggested that financial resources and more effective communication about the policy are needed to elevate the importance of physical activity in rural, low income areas. In Australia, two of the most important current policy documents are contained within the 2006 report; *Be Active Australia: A Framework for Health Sector Action for Physical Activity 2005 – 2010* and the *National Chronic Disease Strategy* (10) .

In 2008 the National Preventative Health Taskforce produced *Australia: the Healthiest Country by 2020; A discussion paper* (9) . In it a "*comprehensive and lasting*" Preventative Health Strategy by mid-2009 is promised. The discussion paper sets out a framework to achieve better health through "*major reductions in the diseases caused by obesity, tobacco and alcohol*". It is noteworthy that although multiple references are made to physical activity in the text, there is no mention of it in the forewords by the Minister or the Taskforce's Chair.

Queensland state policies also target chronic diseases and support the reduction in risk factors, for example the *Supportive Environment for Active Living (SEAL) Strategic Framework for Action* (95) and the *Department of Health Queensland Strategic Plan 2007–12* (96). The 2006 publication, *Be Active Queensland 2006-2010* provides a framework for health sector action for physical activity in Queensland (97). The report documents all the current strategies to support physical activity in the areas of communication, workforce capacity and evidence.

Government has promised to engage actively in local government corporate planning processes to ensure positive health is a consideration at a strategic level and that physical activity will be one of the performance indicators. In August 2008 the Queensland Premier announced that a healthiest community competition would be initiated among towns. The

rationale behind the competition is "*about encouraging Queensland communities to become healthier across the board*" (98).

There is reasonable evidence to suggest that levels of physical activity in rural Queensland are lower than in larger urban cities. However, the sample sizes and response rates from prevalence surveys have limited the accuracy of estimates, particularly at the subregional level. However, there is sufficient evidence of lower levels of physical activity in rural localities for specific state wide policy development to address this issue. A key reason for doing so is to further progress the State's Chronic Disease Strategy (6).

For policy and interventions to be appropriate they must be relevant to the targeted population - *targets would need to be state or territory specific, recognising ….the challenges in introducing interventions in different settings (urban/rural/remote)* (99). A key question is whether physical activity intervention in rural areas requires different solutions to those elsewhere and although policies are informed by expert consultation and literature, the influence of geographical context on physical activity is limited (100).

As stated in the Wide Bay Burnett Regional Plan;

The *Strong Communities* section refers to addressing social and locational disadvantage, and includes under *Programs*:

"*5.2.5 Implement and evaluate flexible, integrated, client-driven and sustainable prevention, promotion and early intervention strategies to pre-empt and address social and locational disadvantage, and*

5.2.6 *Establish partnerships across community, government and business to provide more pro-active, community driven, co-ordinated and sustainable responses to social and locational disadvantage." (p.88)*

Under *Healthy and Safe Communities*, Policies include:

"5.3.2 Physical activity and healthy lifestyles are supported through appropriate location and design, including facilitating the provision of active transport infrastructure, such as pedestrian and bicycle paths, and appropriate sport and recreation facilities" (p.89)

Programs include:

" 5.3.5 Develop a collaborative framework that requires multi-strategy and multi-tiered prevention and promotion programs to address community health and safety issues" (p. 89).

The *North Burnett Community Plan 2011-2022* includes sections headed *Healthy and Active People* – region wide, and by locality. The main references to healthy lifestyles are strategies for walking and cycle paths, and recreation facilities to encourage and facilitate physical activity (101). This may reflect a lack of concern or awareness about other factors affecting

individual health, but may equally reflect the major concerns about access to health services, provision of which appears in the strategies for all locations.

The *Fraser Coast Community Plan 2011- 2031* states, in its vision for 2031, that Fraser Coast will:

"Be a happy, active, healthy, safe and engaging place to live"

The format of this Plan is to state high end, long term goals under various themes, and does not provide more detailed strategies.

Under *2.2 Safeguarding Community and Wellbeing,* the *Healthy Community* goal is:

"Physical, mental and spiritual wellbeing is promoted and supported by dedicated organisations and high quality health care facilities and services."

Reference is also made to healthy active lifestyles under the *Our Movement and Access Section:*

"5.5.1 Extensive walking, cycling and mobility scooter networks are developed throughout the region to promote healthy active lifestyles in a safe environment"(102).

A critical analysis of UK government policy against lay experiences regarding food choice among low income cohorts (98) concludes that government policy largely focuses on individual responsibility and informed choice (the empowered consumer), hence consumer awareness and understanding healthy food choices. Assumptions are that lack of knowledge, and availability of healthy foods accounts for poor diets.

Freeman's "Fast Food; Oppression Through Poor Nutrition" takes this approach further and argues that, in the US, there are multiple systemic barriers to good nutrition for the poor, and particularly minority racial groups, who are significantly overrepresented in poor urban neighbourhoods (103). This commentary, similar to the UK study, points out that government policy messages tend to focus on health as a choice, or personal responsibility, when these choices are not readily available to poor minority groups.

Making Healthy Behaviour Easy, One researcher (104), reports on research projects by Devine from Cornell University, which focus on the increased speed and time pressures for working parents and that those with low incomes have fewer options to overcome this in a healthy way (eg: a misperception about fast food as opposed to a more expensive balanced meal in a restaurant).

Earlier generations than today tended to have food and mealtimes central to lifestyle, family and social relations, with much time spent on preparation. Today, time pressures lead to eating on the run, while doing other things and convenience foods to reduce preparation time. Lack of energy and guilt reinforce these patterns. Devine says findings from the first year of this 3 year study already show "It's becoming quite clear that talking to people about

nutrition by itself isn't enough anymore. People are telling us they're not home at mealtimes, working long hours, and doing so for good reasons. " Devine points out the necessity of food assistance programs to take these factors into account, as many recipients are low-income working women who re-entered the workforce as a result of the Welfare to Work legislation. Many of these women still do not earn enough to feed nutritionally adequate meals to their children (104). In Australia, there would be families similarly affected by employment policies that would be facing the same limitations in translating nutritional advice into practice.

2.5 Key components for successful healthy lifestyle choices interventions for the low-income target group

a) An Adaptive Living Program (ALP) Pilot study in Michigan examined the effects of the program on quality of life and life satisfaction for a small group of 19 low income adults living in a city-subsidised apartment complex. The ALP included 12 modules and 3 community outings over a 12 week period, with sessions conducted by Occupational Therapy students. The study showed few significant differences in physical, social and emotional health variables, possibly due to poorly designed and controlled measures, but participants did report increase knowledge of nutrition and improved interpersonal skills (105).

b) A Study protocol from Sweden outlines a cluster randomised intervention program in preschools in low income areas of Stockholm to assess the impact of including parental support programs in conjunction with classroom based activities, in promoting healthy diet and physical activity in children (106).The schools are mainly located in low-income areas. This model presents another example of a multi-facetted approach, where classroom activities are reinforced with Motivational Interviewing of Parents as well as information provision.

Recommendations from findings in relation to the structure of intervention programs include: Small goals, encourage self-rewards (not food), encourage 3 day diary about activity and food intake, particular focus on emotions and eating responses, encourage problem-solving to overcome identified triggers.

c) Researchers in Vaal in South Africa, where somewhat different cultural and poverty factors exist, including malnutrition, underweight children and high incidence of hygiene related illness and diarrhoea, and poor health and nutrition impacts on educational ability, describe a process used to design materials to teach young children about nutrition(107). Researchers worked with life skills teachers, who identified barriers and challenges for them in providing this teaching – mainly time and the lack of resources. A retail search found no suitable resources, so these were developed from scratch and included a card game, board game, the "plate puzzle" and a simple activity book. Careful analysis of literature determined the primary messages, and the final products were professionally designed and incorporated culturally relevant material. They were initially pre-tested on 48 children, also assessed by a dietician and linguist. These Nutrition Education Tools (NET's) are to be field tested and finalised.

d) The *Sisters in Health* experiential program, designed to increase fruit and vegetable intake by low-income women (108) takes this concept of the importance of social support beyond the family, so that the program emphasises social interaction. The program includes active food experiences, positive social settings, a flexible meeting series and small group facilitation by para-professionals already in the community. Extensive formative research informed the Program design, which is adaptable to a variety of settings, with 10 meeting topics, from which the members could choose. Increased confidence in ability to prepare fruit and vegetable that their families would like was important. A key feature of this approach acknowledges the importance of life experiences in forming beliefs and choices about food and diet, and seeks to create positive social experiences around the subject of good nutrition for participants (108).The program was shown to be effective, with a non-random sample of 269 adults in 32 interventions and 10 control groups showed that intervention group participants increased fruit and veg intake by 1.6 serves per day and were 0.44 times more likely to be eating fruit and vegetables 5 or more times a day.

e) In Queensland, evaluation of the "*Lighten Up*" program showed that the two-month program based on the trans-theoretical model of behaviour change (109), achieved significant increases in fruit and vegetable intake by participants (0.6 and 0.4 respectively) and weekly minutes of walking significantly increased by 78% during the duration of the program. A large percentage of participants were obese or overweight at registration, and there was a significant reduction of 1.4 kg in mean weight, 3.7 cm in mean waist circumference and 0.5 units of mean BMI over the two month program. The program also resulted in improvements in self-esteem, and is considered an example of best practice healthy lifestyle behaviour change programs (110). Data are lacking as to sustainability and the long term effects.

f) *Community-based social marketing* (CBSM) (111) draws heavily on research in social psychology, which indicates that initiatives to promote behaviour change are often most effective when they are carried out at the community level and involve direct contact with people. The emergence of community-based social marketing can be traced to a growing understanding that programs that rely heavily or exclusively on media advertising can be effective in creating public awareness and understanding of issues related to (sustainability), but are limited in their ability to foster behaviour change (112).

g) Healthy Lifestyle programs for Aboriginal and Torres Strait Islander Communities

The Evaluation of Healthy Weight (now *Living Strong*) Program (113) showed that results were generally positive, with around 50% showing weight loss, but there were some challenges maintaining involvement and hence pre and post measurements for a proportion of participants. Program barriers were also identified by facilitators:

- Lack of funding to provide catering or incentives
- Time the program was offered
- Stigma of involvement in the Healthy Weight Program
- Poor attendance and high attrition

- Transport
- Facilitator capacity
- Venue availability
- Difficulty of evaluation.

h) In the formative evaluation of the Kuwinyuwardu Aboriginal Resource Unit Gascoyne Healthy Lifestyle Program, Howie developed a model for improving health outcomes in Aboriginal communities (114).The model he developed uses a community development approach, which seeks to train and empower people from within the communities to promote healthy lifestyles. This 'best practice' model has four key dimensions:

- Principles of cultural security
- Principles of community development and capacity building
- Principles of health promotion
- Principles of management and training in the design and delivery of programs in Aboriginal communities.

i) *A Best Practice Model for Health Promotion programs in Aboriginal Communities*, (115) provides a concise but comprehensive outline of the principles and considerations which make for best practice in working with this particular target group.

j) Young et al. developed a program that presented a blend of educational and marketing strategies targeting preschoolers that was implemented in Head Start classrooms(116). The 12-week intervention contained a narrow, behaviour-based "try new foods" message, multiple nutrition education activities, and repeated opportunities to taste 13 novel foods. Key strategies used and findings from the formative evaluation process are presented here in an effort to provide insight for nutrition educators interested in developing similar interventions (p.250). They suggested that the key learning from this model was that interventions need to be tailored to the target audiences. They found that using focus groups was a valuable way to understand the perceptions, values and opinions of the participants and potential target audience (117).

k) Bisogni et al. (118) studied low to middle-income residents in upstate New York to develop a conceptual model regarding the processes by which life course events and experiences influence management of food and eating, to provide insight for nutrition practice. The researchers found that *Food management skills* generally build over life stages, but various changes in *circumstance* may facilitate or even force development of new skills (such as having to cook for yourself, manage on a smaller budget), and may also limit capacity (e.g. poor cooking facilities) (64). *Practices* tend to reflect childhood expectations, so some concepts remain, but again, circumstances and life changes, education, etc, may bring about changes and evolution of personal standards. *Food choice capacity* is the personal satisfaction at any point about the person's ability to meet their standards. This model uses a constructionist approach which means that self-efficacy is measured against one's own perceptions of standards, which may or may not reflect good health choices.

Nevertheless, the model does provide some useful principles in understanding factors which affect capacity when designing programs to promote healthy choices.

2.6 Summary

Findings of the literature review suggest that a need exists in this region for additional development and evaluation of dietary quality measurement tools for low income and minority audiences. Barriers to healthy choices included geographic location of services, accessibility, socioeconomic levels, education and motivation to change. The effect of social structure on inequalities in the distribution of weight is a repeated theme throughout the research explored and patterns of obesity were seen in many studies to directly impact on choices made by families and individuals.

Individual, social and community influences on behaviour were often supportive but also suggested that barriers to healthy choices included factors such as lack of motivation and lack of knowledge. The importance of multilevel approaches to promoting healthy lifestyles in regional and rural, low income adults was noted throughout the literature.

The wide range of factors which influence healthy lifestyle choices, and the limited studies of successful interventions indicate the importance of direct and positive engagement with participants, and the need to carefully structure messages, activities and materials, based on the factors operating for the participants. Social marketing designed to encourage a change in belief about physical activity will support local initiatives to increase physical activity, promote a change in culture and change the perception that incidental rural work activity provides sufficient physical activity.

While some Australian programs have been identified to address the above needs, many have not been found to provide a relevant evidence base for the named interventions of the current study. This raises the need for the current evaluation to provide an evidence base for programs aimed at interventions for low socioeconomic populations in rural Queensland. More objective measures are required to assess the physical activity and energy expenditure levels of rural people who perceive that they are unable or not motivated to make the required healthy choices needed.

3 METHODOLOGY

3.1.1 Method

The evaluation methodology for this study fits within the Community-Based Social Marketing Model (CBSM) (112) by which the Red Apple Program has been developed. CBSM provides an effective overarching framework that emphasises the crucial role of monitoring and evaluation in design and delivery of projects such as this one, where sustainable behavioural changes are the priority. Central to the CBSM approach is the identification of barriers and benefits to individuals engaging in sustainable behaviours. As

identified within the literature review, the barriers may be internal to the individual, such as lack of knowledge, or external, as in structural changes that need to be made in order for the behaviour to be more convenient (e.g. teaching simple gardening skills or how to shop on a budget).

Exploring past research indicated that there was a lack of availability of detailed methodologies behind some of the published research. It was difficult and impractical to combine and use previous methodologies for several reasons: 1.The questions behind other research studies were not generally available for viewing and 2. Our current surveys were designed specifically around our particular research design (CBSM), and it was not possible to 'lift' questions from other, past studies as was suggested by the funding body early in the planning phases of the study.

The current pilot study was guided by the Community Based Social Marketing (CBSM) model. Appropriate targeting is consistent with this CBSM model(112).

A key component of CBSM is the identification of barriers to change, so this was built into the evaluation tools, both in terms of content of questions, and in design, so that participants would be more likely to participate, but also so that some tools virtually become a CBSM behaviour change tool in themselves, such as the Star Tool as a prompt with our key messages. Consistent with this approach, is the need to focus on clear, simple, consistent messages so that the program will impact on changes in behaviour most likely to have a healthful impact.

Keeping in mind the key to the whole program was to create relevance to the target group, partners implementing the program provided input to ensure the evaluation was relevant also. Partner service providers (Glendyne Education Centre, Reconnect Youth Homelessness Program, PACE Program for partner UCC, Red Apple staff member, Red Apple Program Coordinator, Facilitators as well as Department of Health Queensland staff members)provided feedback and ideas regarding the suitability and acceptability of various questions and presentation of questions to maximise the likelihood of participation and reliable data collection. Low-literacy level of participants was a key consideration in the framing of questions.

An advisory Group was set up in August 2011 within 2 months of the start of the project to provide input into the development of the Project. In particular, the Advisory Group was heavily involved in the initial consultation process and the development of the project framework. Terms of Reference were established at the formation of the Advisory Group and submitted to the Department of Health QLD. The Advisory Group met for a number of workshops during the Project development phase. The Project Coordinator also met with many members individually in addition to these workshops. This Group was active until the completion of the Program Manual and Resources in May 2012. Members were updated via email on the program implementation thereafter. Many community service providers who

were on the Advisory Group were also directly involved in the implementation of the Red Apple Pilot. Program implementation began in August 2012 and was carried out for 8 months until March 2013. Implementation was carried out through the existing community service providers of the Hervey Bay Neighbourhood Centre and Uniting Care Community.

A limited number of other service providers such as St Vincent de Paul Family Services and Epic Employment also joined the pilot implementation. Program Delivery Locations included:

- Fraser Coast:
  - Hervey Bay
  - Maryborough
- North Burnett:
  - Gayndah
  - Eidsvold
  - Munduberra
  - Biggenden

3.2 Aims of program

The primary aims of this Pilot program were to:
a) increase knowledge and skills of participants to better adopt healthy eating behaviours,
b) increase participant ability to better adopt healthy Physical Activity (PA) behaviours, and
c) increase parent ability to establish healthy eating and PA behaviours in their children.

The research questions for the study were:

i) How effective are the Red Apple programs in increasing knowledge and skills and changing behaviours in relation to healthy nutritional and physical activity choices, for this target group?
ii) Was the CBSM a good model for service delivery to this target group?
iii) Were the materials used the most suitable for use by service providers in attaining required outcomes?

3.2.1 Process evaluation tables

Discussions between the service partners and the evaluation team highlighted some key considerations in the design of data collection tools which are to be completed by participants:

- Easy to understand and self-explanatory-may include visual cues
- Easy to administer. Due to confidentiality and other program constraints, and the fact that some participants will need help to complete surveys, these tools need to be as simple and brief as possible, while capturing essential data
- Non-technical: participants are unlikely to understand or be interested in technical information
- Non-judgemental in tone: many participants in the target group experience multiple life difficulties and many have low self-esteem, and our literature review reveals the

many and varied barriers to making healthy lifestyle choices for people with low incomes. Questions need to be framed in a way that does not convey judgement, or exacerbate any feelings of guilt.

The following key messages (behaviours) evolved from the Manual working group discussions and guided its development. The target group needs to:

- Eat more Fruit and Vegetables each day
- Drink more water each day, and less sugary drinks
- Try to get 30 minutes of exercise each day
- Eat breakfast every day
- Prepare more meals at home
- Eat less take away and fast foods
- Take time to plan for healthy meals at home
- These messages apply to both adult participants and their children.

These key messages guided the development of the actual program manual, and this in turn provided guidance for the data being collected for the Evaluation.
The program manual consists of five sections:

i. Basic Nutrition
ii. Nutrition for Children
iii. Healthy Meal Planning on a Budget
iv. Healthy Cooking
v. Introduction to Physical Activity.

Based on the project objectives and in consideration of the key messages each section of the Manual aims to deliver, the following Evaluation Framework Tables were developed.
This included the following processes.

The evaluation framework was the starting point, acknowledging that each program will have unique circumstances; some programs may not have the capacity or the willingness of participants to complete all sections of the survey. For the purposes of the evaluation, programs where a majority of participants do not complete the data collection tools were not included in the data analysis. Ongoing consultation with the service partners during the development of the evaluation tools and methodology maximised relevance of the data collection tools and participation in the evaluation.

Objective 1: Increased knowledge and skills of participants to better adopt healthy eating behaviours
Objective 2: Increased participant ability to better adopt healthy physical activity behaviours
Objective 3: Increased parent ability to establish healthy eating and physical activity behaviours in children.

The objectives and sample questions were refined in the final drafting of the various data collection tools, in relation to:

- Process – of developing and delivering this Pilot program
- Impact - of the program in building understanding, skills and confidence around healthy lifestyle choices, for participants, and
- Outcome-in terms of actual behaviour changes towards healthy lifestyle choices as a result of participating in the program. This also included questions relating to barriers.

The Red Apple Program Steering Committee was established within 1 month of the start of the Pilot Project in June 2011 and functioned to oversee the Advisory Group and Manual Working Group, as well as to discuss project issues and approve documents before submission to the Department of Health QLD. The Steering Committee consisted of members from all key partners/stakeholders of the Project. Terms of Reference were established at the formation of the Steering Committee and submitted for approval to Department of Health QLD. The Group met regularly throughout the Project.

Of key importance was relevance to the target group so a modified Delphi technique was employed involving multiple expert service providers in the fields of nutrition and physical activity and lifestyle to provide input. Partner service providers provided feedback and ideas regarding the suitability and acceptability of various questions, and presentation of questions during each step of the planning process to maximise the likelihood of participation and reliable data. The low-literacy level of participants was a key consideration in the framing of questions for the target population. For the full list of participating services and their clientele (see Appendix A). As earlier stated the target group was families and young people from within identified local low socio-economic groups and/or with high levels of disadvantage who normally engage with these service providers.

The final Red Apple Program Manual that resulted from the efforts of the Manual Working Group is a practical, visual and engaging Manual designed to be implemented by community Service Providers with their disadvantaged client groups. The Manual combines Community Development Principles with current (prior to May 2013) guidelines for nutrition and physical activity using CBSM techniques.

The manual includes 5 key sections relating to principles essential to a healthy lifestyle. Within each section are a number of related activities which are versatile to community service providers and their clients, whether youth or families. Each activity includes Facilitator Notes, which contain straight-forward background reading in order to understand the topic and the key messages the activity is designed to convey. Other included facilitator resources help service providers plan and conduct the Red Apple Program with ease. The Program Manual is very flexible in that service providers build their own program based on their clients' needs by selecting activities that are relevant. Each program, however, remains

similar in that the Healthy Food Basics 1 and Introduction to Physical Activity topics are compulsory and make up the core components of each program.

The Red Apple Program had an embedded Evaluation that was conducted along with the implementation of the program. The Evaluation designed required Red Apple staff to distribute and collect a series of Evaluation Forms which were sent to USQ Toowoomba for analysis. This included:

- Service Provider Facilitator Report Questionnaires
- Participant Pre and Post Surveys
- Participant 3 Month Post Program Surveys
- 2 Service Provider Focus Groups
- Key Partner/Stakeholder Questionnaire.

3.3 Sample

Convenience sampling was utilised to access a cross sectional sample of approximately 200 participants. As earlier stated it was intended to engage families and young people from within identified local low socio-economic groups and/or with high levels of disadvantage who normally engage with these service providers. Families and some young people from within identified low socio-economic groups and/or with high levels of disadvantage were engaged for the project. Participants were recruited by the Neighbourhood Centre and partner organisation staff from within the populations with whom they are already engaged. This was undertaken during the course of providing usual service to clients. The participants were those who normally engage with the above identified service providers in the region and have already developed trust relationships with the providers.

Multiple Hervey Bay Neighbourhood Centre and Uniting Care Community program locations where participants have already established programs and relationships of trust were the target sites. In addition, several other service providers participated in the Pilot in the Fraser Coast area. From these Red Apple programs, 200 participants were invited to participate in the project and the final total of participants was 176. This involved participants from a wide range of services operating in the region.

3.4 Data collection

The Pre and Post program questionnaires were designed and (pilot tested) to be as easy as possible for participants to complete, but it was recognized that in some cases they may be completed with the assistance of the service provider. The following phases of activity were involved, some of which occurred concurrently.

Phase 1: Community Service Provider Consultation and Literature review that informed the project evaluation as well as identifying the benchmark data sets most suitable for this particular pilot project.

Phase 2: Delivery activities; The program called for delivery of activities to up to 200 individuals. The Neighbourhood Centre has at least 12 programs and partners all of whom are currently working with members of the target population. Partners included Family Connect, Fraser Coast Migrant Settlement Program, HBNC Limited Hours Childcare Program. Activities were informed by the literature review and by past evidence from partners and Department of Health Queensland. The University of Southern QLD was not involved in this phase of the project.

Phase 3: Within the CBSM, evaluation of the program in relation to outcomes from the delivery and follow up of activities that were aimed at leading to changes in behaviour and improved health and well-being behaviours.

Table 8. Process Evaluation Table

Process Objectives	**Process objective** based on original RFO and Eval Team and Working group feedback	**Data collection tools**	**Question / intent**
Program reach to target cohorts	**Demographics questions** – our target groups are: - young people 12-24 - families - Aboriginal & Torres Strait Islanders assume young people and families **Geographic questions** – where within the Wide Bay Burnett reach were participants reached? **Community service provider client target groups** – which service provider were participants accessing the project through and what target groups do they work with? (Program report) (Disadvantage/Low income target groups)	Client questionnaires Post Program Reports	What is your age in years? Male/female Are you single, single with children, partner but no children, partner and children? A&TSI identification Do you identify as Aboriginal or Torres Strait Islander - Yes, Aboriginal - Yes, Torres Strait Islander - Yes, both No Language Do you speak a language other than English at home? - Yes - No, English only If yes, which language? Cultural Diversity ; Were you born in Australia? - yes - no If no, in which country were you born? Location of Program (Program Report) What are the eligibility criteria for participation in your service/program? (Program Report)
Quality of Partnerships	Advantages and disadvantages of Model of Service delivery- collaboration of many programs and two major SPs Advantages and disadvantages of pilot program development- collaboration between QH staff, HBNC, UCC, USQ and JL&A	Focus Group Stakeholder/Partner Survey	How did you find working with other organisations to deliver this pilot program? Multiple choice/rating How did you find working within the multi-disciplinary team?

Program as delivered from Manual	Quality of content and layout	Focus Group	How useful was the content of the Manual in relation to your client needs
	Ease of use for Service Providers	Post Program Report	How did you find using the Manual for planning and delivering the program? Multiple choice
		Post Program Report	How did your participants respond to the program? Multiple choice or rating
	Participant satisfaction		
			Did you find that delivering the program was affordable-expensive. multiple choice
		Post Program Report	Please provide any other comments that might assist with making improvements to the program in the future.
		Focus Group	
		Post Program Report	
	Cost/affordability to Service Providers		
		Focus Group	
		Post Program Report	
	Other comments		

Table 9. Impact & outcome evaluation table
Objective 1: Increased knowledge and skills of participants to better adopt healthy eating behaviours

Section of manual	**Impact and Outcome objectives** based on key messages that Manual Working groups determined	**Data collection tools**	**Impact Question Intent**	**Outcome Question intent (behaviour change) and Barriers to Change Question**
Nutrition overview	Has the program increased participants' knowledge around the recommended types of foods and drinks to consume? As evidenced by their knowledge of: 1 What are the 5 food groups? 2 Selecting healthy food in shopping trolley from 11 food categories – virtual supermarket 3 Eating breakfast	Questionnaire before and at end of program Post program questionnaire Pre-program questionnaire Post program questionnaire Pre-program questionnaire	Which of the following foods are important to eat? Multiple choice – 5 food groups Are you more confident about shopping for healthy food and drinks? Why is it important for people to eat breakfast?	Do you and your children eat more healthy foods since you completed the program? Multiple choice Do you and/or your children eat more fruit and veg since completing the program? Multiple choice Do you and/or your children drinks less sugary drinks since you completed the program? Multiple choice Barrier question What prevents you from cooking healthier food" at home? multiple choice Do you buy more healthy food each week since completing the program? Multiple choice Barrier question What is preventing you from buying more healthy food? Multiple choice Have you increased the number of times you and/or your children eat breakfast each week since completing the program? Multiple choice Barrier question What prevents you and your children from eating breakfast? Multiple choice
Budgeting/ Shopping	Has the program increased participants' skills around		Questions on skills/confidence in	

	budgeting for healthy meal preparation? Has the program increased participants' skills around healthy meal preparation? As evidenced by their knowledge and skills below: 1 What are the freezer, fridge and pantry staple items? 2 plan meals for a week 3 Where in local area can I buy affordable food?	Post question Post question Pre and post questions Pre and post questions Post questions	budgeting and meal planning Do you feel more confident to choose healthy food for your pantry, fridge and freezer? Do you feel more confident planning easy healthy meals for yourself or for your family, that you/they like? Do you consider that home cooked meals can save you money? Do you feel more confident about where to buy affordable food items for healthier home cooked meals?	Are you keeping a more healthy selection of food in your pantry, fridge and freezer since completing the program? Multiple choice Have you been using more healthy meals for yourself &/or your family from pantry, freezer and fridge items since completing the program? Multiple choice Can you think of examples where you have saved money by cooking meals at home since completing the program? Multiple choice Are you shopping more often at shops which offer lower cost foods since completing the program? Multiple choice Barrier question What prevents you from keeping a supply of healthy food in your pantry, freezer and fridge to make easy, tasty meals at home? Multiple choice
Cooking	Has the program increased participants' skills around cooking for healthy meal preparation? As evidenced by their	post questions	Questions of confidence/skill re meal preparation Have you gained more skills and knowledge	Have you been cooking more easy, tasty, healthy meals at home since completing the program? Multiple choice Barrier question What would stop you from cooking more healthy meals at home?

	knowledge, skills and ability to: How to make Recipe ideas that are convenient, easy, tasty, filling, low cost and healthy Cooking skills & food safety Healthier alternatives & portion sizes Recipe renovation – making favourite recipes more healthy	Post questions	about cooking easy, tasty meals as home? Do you feel more confident to prepare healthy home cooked food for your family?	Multiple choice

Objective 2: Increased participants ability to better adopt healthy physical activity behaviours

Physical Activity	Has the program increased participants' ability to adopt healthy physical activity behaviours? Has the program increased parents' ability to establish physical activity behaviours among children early in life? As evidenced by their skills, knowledge and ability to do some (all of the following) : For Adults: (National Physical Activity Guidelines-DOHA) • Think of movement as an opportunity, not an inconvenience • Be active every day in as many ways as you can • Put together at least 30 mins of moderate intensity PA on more, preferably all days • If you can, also enjoy some regular	Questionnaire before and at end of program	Intention to increase physical activity levels Knowledge of amount required for good health From Active Australia Survey: 9(d) Exercise doesn't have to be done all at one time—blocks of 10 minutes are okay. strongly disagre***e*** disagree neither agree nor disagree agree strongly agree	Has your physical activity increased (think about the last week) since completing the program? multiple choice Has your children's physical activity increased since you completed the program(think about the last week)? Multiple choice What prevents you or your children from increasing your physical activity over any given week? Multiple choice

	vigorous activity for extra health & fitness For Teens (12-18yrs): (National Physical Activity Recommendation for Children and Young People 12-18) • 60 mins of moderate to vigorous physical activity every day to aid healthy & development • Limit internet, TV, video games, Facebook to no more than 2 hours a day (Home work doesn't count). For Kids (5-12yrs):NPARFCAYP 5-12 • Children need 60 mins (and up to several hours) or moderate to vigorous physical activity every day. • No more than 2 hours TV time However, for the purpose of this program, these messages have been further simplified for the adult cohort and include: I. Get 30 minutes of physical activity daily and this can be done in 3 X 10min grabs II. Physical activity or 'exercise' means increasing the activities you do so that you are breathing more heavily. III. Physical activity or exercise can be achieved in everyday things we do- walking kids to school, mowing the lawns, vacuuming, raking, walking to shop to buy paper or milk, walking the dog or walking up stairs. Children need at least one hour of vigorous physical activity every day.		(the following AAC question has been modified to reflect that cohort may understand an increase in heavy breathing more than an increase in heart rate) 9(e) Moderate exercise that causes you to breath more heavily can improve your health. Strongly disagree disagree neither agree nor disagree agree strongly agree The following question reflects discussion with PA specialist that reflects observation that people often mistakenly assume that only vigorous exercise counts towards improved health outcomes: Please tick the activities you believe could count as physical activity to improve your health: House cleaning Walking to the local shop for milk and paper Walking to and from school with the children Walking up stairs A walk around the block with the dog Mowing the Lawn	

Objective 3: Increased parents ability to establish healthy eating and physical activity behaviours in children

Children's nutrition	Has the program increased parents' ability to establish healthy eating behaviours among children early in life? As evidenced by their skills, knowledge and ability to remember, prepare and undertake the following: 1 healthy lunchboxes 2 fun or fussy eating 3 Babies and breastfeeding	Post program question Post program question Post program question Post program question Post program question	Are you more confident to guide your children to eat healthy food? Are you more confident in planning & preparing healthy lunchboxes and snacks for your children? Are you more confident to prepare baby foods at home from fresh ingredients? Do you better understand the benefits of breastfeeding for your baby? Would you feel confident to try breastfeeding if there was the opportunity in the future?	Are your children to eating more healthy foods since you completed the program? Multiple choice Have you been preparing more healthy lunch boxes and snacks for your children since completing the program? multiple choice Have you been preparing more home made baby foods since completing the program? Multiple choice What prevents you from making your baby food from fresh ingredients at home? multiple choice Would you consider breast feeding your baby/ies in the future as a result of information you received at the program? Multiple choice Barrier question What has prevented you from choosing to breastfeed in the past? Multiple choice including n/a

The purpose of the evaluation was to determine if the objectives of increased knowledge and skills and changes in behaviour with regard to healthy lifestyle choices have been met. USQ was responsible for supporting the design of the data collection instruments and the analysis of the data. Three principal methods were to be used for evaluation; surveys, program reporting and focus groups. All data collection from clients was undertaken by the service providers with USQ's involvement limited to development of evaluation tools and analysis of results.

Client surveys (see appendix B) were administered by providers at entry and exit points of individual activities around established benchmarks within that activity. For example: information in relation to changes in weekly exercise or amount of fruit and vegetables consumed; change in source of food (take-away versus home prepared meals); and involvement in new activities (e.g. growing vegetables, taking up a new hobby or sport). Some activities such as an exercise program may run for a few weeks, others such as health nutrition may be ongoing for the entire project duration. Results from clients who engage in multiple activities were combined for comparison and analysis. Data was collected via survey at three months post activities to determine if behaviour changes have occurred and been sustained among the participants. Program providers were asked to complete questionnaire as key stakeholders/partners regarding the actual process issues, such as expectations, clarity around responsibility, partnering arrangements and to determine the success and applicability of the programs to the consumers at the end of each program. Two focus groups involving service providers were conducted three months apart to explore expectations and then later to explore observations and experiences in relation to the programs they conducted. During the implementation phase 176 participants completed the Evaluation, which was embedded into the program as per the CBSM model. There was an initial aim for 200 participants.

3.5 Data analysis

Qualitative analysis of data from surveys and focus groups was undertaken by thematic analysis with exploration of emerging themes using NVIVO10 which is a qualitative data organizing software program. Quantitative data was analysed using the IBM SPSS statistics 21 program. Descriptive statistics such as frequency counts and percentages as well as means, standards deviations, were calculated from summaries (including the data pertaining to demographic profile of the participants, healthy eating, physical activity, and barriers to maintaining a healthy lifestyle). Chi-Square, and One-Way ANOVA were calculated to determine whether there were significant differences in opinions of the participants with regards to their knowledge, confidence, behaviour changes in healthy eating and physicals activities, based on their time of participation in the survey. The resulting differences in healthy eating and physical activities were tested for significance at .05 level of probability with an accompanying 95% confidence level. Results are presented as de-identified and aggregated data.

3.6 Limitations

Owing to changes in government and reduced timelines as a result of unexpected large scale staff redundancies, the data collection phases and program implementations were unavoidably reduced. Other uncontrollable factors included:

- The flood disaster that badly affected the North Burnett region in late January 2013 which halted the Program for over a month in this area as clean up was underway.
- Significant funding cuts to community services by the State Government,
- The shortened length of the implementation phase by 3 months**.**

3.7 Ethics

Ethics approval was obtained from the University of Southern Queensland prior to commencement of the project (reference number H12REA030).

3.8 Significance of the study

Benefits of this study to participants are seen as being; improvements to knowledge and skills to adopt healthy eating behaviours; improved ability to adopt healthy physical activity behaviours; and increased parents' ability to establish healthy eating and physical activity behaviours among children early in life. Some individuals who participate in the research projects may feel satisfied by the opportunity to shape the Red Apple program available to the community by providing systematic feedback on what is useful and what is not useful for them. It is therefore likely that the evaluation findings will seek to improve the program and will benefit future participants.

3.9 Summary

This evaluation contributes to continuous quality improvement and potentially contributes to evidence to support program recognition and findings. The information about the program that was collected sought to improve the achievement of goals and objectives of the program as well as providing valuable information to improve the program delivery. The final evaluation produced through this research will contribute to the knowledge base around the Department of Health Queensland Healthy Living initiatives and become part of the cycle of continuous improvement cycle in this relatively new area of health practice.

4 FINDINGS

4.1 Quantitative findings

4.1.1 Demographic profile

Red Apple staff found the general reception of the Red Apple Program by service providers and clients to be extremely positive. The majority of Evaluation Forms were received back filled with only the 3 Month Post Program surveys being the exception. Though many of the 3 Month surveys were distributed, the transient nature of the target group made it very difficult to follow these up and as a result only a small number of these were collected. Twenty communities were involved in the program and their demographic profiles are shown in Table 10. More than four-fifths (81%) of the participants were female and 19% male. The age ranged from 14 to 77 years; the average age was 31.4 years. For analysis purposes, age of the participants was broken into four categories. The highest proportion of participants was 21 to 40 years of age, compared to 31 percent below 21 years; only five percent was above 60 years of age.

Almost one-fifth (19%) of the participants were Aboriginal and Torres Strait Islander and /or both. The majority (81%) of participants were born in Australia as compared to 19% born in another country such as, Philippines, England, New Zealand, Germany, Thailand, India and China. Most of the participants (81%) speak English at home and only 19 percent speak other languages such as Croatian, Dutch, Filipino, German, Indonesian, Lithuanian, Mandarin, Punjabi, Samoan, Spanish, Tagalog, Tamil and Thai. More than two-fifths (44%) of the participants were married or had partners with children as compared to 22% single with children. The number of children of those single parents ranged from 1 to 9 and 1 to 7 who were married, or have a partner and have children (Table 10).

4.1.2 Healthy eating

Highest proportions of participants in all three surveys (before, after and 3 month) indicated that apples; eggs; milk & cheese; Weet-Bix; sultanas; bread, pasta and rice; grilled fish; raw unsalted nuts; and water were considered to be their healthy choice of food (Table 11). Chips; lollies; fried chicken; cakes; soft drink and cordial were the least preferred choices of healthy food.

Table 10.Demographic profiles of the participants

Demographic profile	Categories	Number	Percent
Sex of participants	Male	32	19
	Female	137	81
	Total	169	100
Age group of participants	≥20 years	52	31
	21-40 years	74	44
	41-60 Years	33	20
	Above 60 years	8	5
	Total	167	100
	Mean= 31.4 years, SD=14.90		
Ethnic background	Aboriginal	28	17
	Torres Strait Islander	2	1
	Both	2	1
	Neither	136	81
	Total	168	100
Birth place of the participants	Australia	137	81
	Another country	31	19
	Total	168	100
	If another then which country: China (1), Dutch(1), England(5), Germany(4), India(2), Indonesia (1), Lithuania (1), New Zealand (4), Peru (1), Philippines(6), Samoa(1), Thailand(3),U.K.(1)		
Language used at home other than English	Yes	31	19
	No	133	81
	Total	164	100
	If yes, which language? Aboriginal (1),Croatian(1), Dutch(1), Filipino(2), German(2), Indonesian(1), Lithuanian(1), Mandarin (1), Punjabi(1), Samoan (1), Spanish(1),Tagalog(3), Tamil(1), Thai(3).		
Marital status	Single, with no children	48	29
	Single, with children	37	22
	Married, or have a partner, but no children	8	5
	Married, or have a partner, and have children	73	44
	Total	163	100

Table 11. Distribution of respondents based on their healthy choice of food

Foods consider to be Red Apple	Before		After		Three month	
	Number	Percent	Number	Percent	Number	Percent
Apples	164	97	155	99	15	100
Sultanas	121	71	118	76	12	80
A packet of chips	6	3	2	1	1	6
Lollies, chocolate	4	2	2	1	0	0
Fried chicken	7	4	11	7	3	20
Eggs	136	80	139	89	13	86
Milk and cheese	136	80	140	89	13	86
Weet Bix	131	77	119	76	14	93
Nutrigrain	61	36	26	16	4	26
Bread, pasta and rice	110	65	122	78	13	86
Cakes and biscuits	6	3	5	3	0	0
Grilled fish	133	78	140	89	12	80
Raw unsalted nuts	106	62	130	83	11	73
Baked Beans	94	55	103	66	9	60
Water	161	95	152	97	15	100
Soft drink	3	1	2	1	1	6
Cordial	8	4	3	1	0	0
Sports or energy drink	7	4	3	1	0	0

4.1.3 Healthy meals

Data in Table 12 shows that before the participation in the Red Apple program, the mean rating of participants in *Home cooked meals can be more affordable than takeaway meals* was 4.33, indicating that they agreed with the statement; whereas in the after participation, the mean rating was higher (4.64) indicating that they strongly agreed with the statement. This difference was highly statistically significant (F=6.68, p=.001). However, the mean rating in 3 month surveys decreased to 4.27 and this result significantly differed with the after survey result. Similarly, there were significant differences in mean ratings of eating breakfast between before & after and after & 3 month surveys. There were insignificant differences in the mean ratings between the three sets of surveys in relation to the *importance of baby's being breastfed*.

Table 12.F-testresults of healthy eating choice based on three different times of surveys

Healthy eating choice		N	Mean[1]	SD	F	Sig.	Mean* difference
Home cooked meals can be more affordable than takeaway meals	Before	169	4.33	.80	6.68	.001	Before & after; after and 3 month
	After	155	4.64	.68			
	3 month	15	4.27	1.38			
	Total	339	4.47	.80			
It is important for people to eat breakfast	Before	169	4.51	.67	11.44	001	Before & after; after & 3 month
	After	154	4.73	.52			
	3 month	15	3.93	1.62			
	Total	338	4.59	.70			
It is important that babies are breastfed	Before	164	4.03	.84	2.63	.07	
	After	148	4.14	.85			
	3month	15	3.60	1.50			
	Total	327	4.06	.89			

Means[1] were calculated using a five point Likert -type scale: 1- strongly disagree, 2=disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree*Significant at .05 level of probability.

4.1.4 Eating behaviours

Before participation in this program, the highest proportion (83%) of participants responded they had prepared and cooked meals 4-7 times a week, compared to 86% after participation and 87% in the 3 month surveys. Before participation 59% indicated they ate *take-away or fast food* at least once to 3 times a week. 38% ate it less than once a week. After participation this decreased to 45% once to 3 times and increased to 51% less than once a week; however, the results increased to 66% once to 3 times a week in the 3 month surveys and decreased to 27% less than a week.

Similarly there was an increasing trend of eating breakfast within the three periods of surveys. Before participation in the program, 70% stated they ate *breakfast* 4 to 7 times a week; it increased to 75% after participation and 86% in 3 month survey. F-test was employed to examine whether there was a significant difference in the level of food preparation, eating take-away food and breakfast between before & after and after & 3 month survey of the participants. The mean ratings of the statements about food preparation, eating take-away food and breakfast were computed to test the differences. F- values in Table 13

indicated there were insignificant differences between before; after and 3 month after surveys.

Table 13. Eating behaviour of the participants

How often do you usually		N	Mean[1]	SD	F	Sig
Prepare and cook meals from ingredients you have at home	Before	168	1.79	1.08	1.092	.337
	After	155	1.62	.92		
	3 month	15	1.73	1.03		
	Total	338	1.71	1.01		
Eat take-away or "fast foods" (eg: fish & chips, hamburgers, pizza, meat pies, sausage rolls, fried chicken, etc	Before	166	4.08	.85	2.109	.113
	After	154	4.27	.90		
	3 month	15	3.93	1.03		
	Total	335	4.16	.89		
Eat breakfast	Before	168	2.04	1.43	1.341	.263
	After	155	1.84	1.29		
	3 month	14	1.57	1.15		
	Total	337	1.93	1.36		

Means were calculated using a five point scale: 1=6 – 7 times a week, 2= 4 – 5 times a week, 3=2 – 3 times a week, 4= once a week, 5= less than once a week

4.1.5 Eating fruits and vegetables

Analysis of data shows that before the participation in the program, 35 % of participants ate only one a day a meal with 2 or more vegetables, compared to only 32 % in the after participation and 27% in the 3 month survey. The reason for this change was stated as being that participants ate fruit or vegetables for more than one meal a day after the program. The fruit consumption among the participants increased after the program. Before participation 47% of participants stated they ate fruit once a day or more; immediately after participation this increased to 50%; and then to 53% in the 3 month survey.

F-test was employed to examine whether these differences in the frequency of eating vegetables and fruit between before & after and after & 3 month were statistically significant. The mean ratings of both the vegetables and fruit eating were computed and the F-values in Table 14 indicated there were insignificant differences between before & after and after & 3 month survey the participants.

Table 14. Eating vegetables and fruits

How often do you usually do		N	Mean[1]	SD	F	Sig
Eat a meal with 2 or more different vegetables	Before	168	2.59	1.15	.904	.406
	After	151	2.49	1.18		
	3 month	15	2.20	1.08		
	Total	334	2.53	1.16		
Eat fruit (fresh frozen, tinned or dried)	Before	167	2.93	1.54	1.577	.208
	After	149	2.64	1.49		
	3 month	15	2.53	1.55		
	Total	331	2.78	1.52		

[1]Means were calculated using a six point scale: 1=more than once a day, 2= once a day, 3=5 – 6 times a week, 4= 3 – 4 times a week, 5= 1 – 2 times a week, 6= less than once a week.

4.1.6 Drinking habits

Before participation in the program the ranges of sugary drinks of the participants were 0 – 18 glasses per day, after their participation it decreased 0 – 15 glasses, and 0 – 3 in 3 month survey. Data in Table 15 shows that the mean ratings of sugary drinks per day of the participants were insignificantly decreased from 1.8 (before participation) to 1.0 in 3 month time.

Table 15. Drinking habits

Drink consumption		N	Mean	SD	F	Sig.
How many glasses of sugary drinks (cordial, flavoured milk, soft drink, alcohol) do you usually have each day?	Before	169	1.80	2.39	.787	.45
	After	149	1.79	2.52		
	3month	15	1.00	.92		
	Total	333	1.76	2.41		
How many glasses of water do you usually drink each day?	Before	168	6.74	4.97	1.03	.35
	After	150	6.39	3.68		
	3 month	15	5.13	2.99		
	Total	333	6.51	4.36		

Similarly it was stated that before their participation in this program water consumption ranged from 0 – 32 glasses per day, after their participation it decreased from 0 – 24 glasses and 0 – 10 glasses in 3month time. The mean ratings showed a slight decrease in water consumption of the participants over the 3 month times (Table 15).

4.1.7 Physical activity

Before participation in the program 88% of participants either agreed or strongly agreed that '*exercise doesn't have to be done all at one time- 3 blocks of 10 minutes per day' are okay*; 94% stated the same after their participation and 78% of 3 month survey. Further, the participants in all three surveys either agreed or strongly agreed that *regular moderate physical activity that makes you breathe more heavily can improve your health*.

These differences were tested using F-test. Data shown in Table 16, there was a difference in mean ratings in the statements about physical activity for improvement of health between before &after and after & 3 month of survey of the participants in this program. The F-values for both the statements were 14.35 (p=.001) and 6.33 (p=.002) respectively, indicating highly significant differences within the three times of survey. To identify which group or groups differed significantly from the others, a Tukey test was performed. As shown in Table 16, the mean rating of the participants after their participation on *For adults, exercise doesn't have to be done all at one time – 3 blocks of 10 minutes per day are okay* differed significantly from their before participation. They had higher mean rating in after participation, indicating that they had strong agreement with this statement. However, the mean rating of the participants in 3 month survey decreased to 3.80 which differed significantly from their after participation.

Table 16. Physical activity for adults

Physical activity for healthy life		N	Mean[1]	SD	F value	Sig.	*Mean difference
For adults, exercise doesn't have to be done all at one time – 3 blocks of 10 minutes per day are okay	Before	165	4.04	.70	14.35	.001	before & after; after & 3 month
	After	152	4.52	.62			
	3 month	15	3.80	1.26			
	Total	332	4.20	.73			
Regular moderate physical activity that makes you breathe more heavily can improve your health	Before	162	3.98	.71	6.33	.002	before & after
	After	150	4.31	.82			
	3 month	15	4.13	1.35			
	Total	327	414	.81			

[1]Means were calculated using a five point scale: 1= strongly disagree, 2= disagree, 3= neither, 4= agree, 5=strongly agree.
*Significant at .05 level of probability

Similarly, the mean rating by participants after participation in '*Regular moderate physical activity that makes you breathe more heavily can improve your health'* differed significantly from their before participation in the program. They had higher mean rating (4.31) in after participation (Table 16). For activities considered as physical activity except gardening (55%), the percentages of participants in all the activities ranged from 65-78 before participation in the program and had increased from 80-91 after their participation; except for walking to the local shop for milk and paper (80%)(see Table 17).

Table 17. Activities counted as physical activity

Activities count as physical activity to improve your health	Before		After		3 month	
	Number	Percent	Number	Percent	Number	Percent
House cleaning	116	69	140	91	10	66
Walking to the local shop for milk and paper	132	78	133	86	12	80
Walking to and from school with the children	109	65	128	83	9	60
Walking up stairs	116	69	132	86	8	53
Gardening	93	55	123	80	8	53
A walk around the block with the dog	131	78	139	90	9	60
Mowing the lawn	120	71	131	85	9	60
Cycling	118	70	127	83	9	60

4.1.8 Amount of physical activity needed daily

Data in Table 18 show that there were varied responses on the amount of physical activity for children. Before the participation in this program 35% indicated the children should have an hour of physical activity each day, compared to 28%, who stated 30 minutes and 21% who stated 2 hours; whereas after participation 40% indicated 1 hour's physical activity compared to 22%, who said 30 minutes and 33%, who said 2 hours. Similarly, after 3 months, 37 % responded that the children should have physical activity for 1 hour, compared to 25%, who said 30 minutes and 26% who said 2 hours. As there were insufficient data in the 3 month survey, a Chi-square test was computed with only before and after survey data of the participants. Chi-square (14.247, p=.02) results showed there were significant differences in

opinion for before and after participation. After participation in the program, participants stated that the children-aged between 5 to 12 years should have physical activity from 1 to 2 hours each day.

Table 18. Amount of physical activity for children

Children's physical activity-age between 5 and 12 years need each day		Time			Total
		Before	After	3 month	
30 minutes	Count	42	29	3	74
	% within participants	57	39	4	100
	% within Time	28	22	27	25
	% of Total	14	10	1	25
1 hour	Count	53	53	4	110
	% within participants	48	48	4	100
	% within Time	35	40	37	38
	% of Total	18	18	1	37
2 hours	Count	31	44	2	77
	% within participants	40	57	3	100
	% within Time	21	33	18	26
	% of Total	11	15	1	26
Don't know	Count	24	7	2	33
	% within participants	73	21	6	100
	% within Time	16	5	18	11
	% of Total	8	2	1	11
Count		150	133	11	294
% within participants		51	45	4	100
% within Time		100	100	100	100
% of Total		51	45	4	100

4.2 Activity Levels

4.2.1 Willingness to do physical activity

Before participation more than three-fifths (63%) of the participants stated they would do physical activity 4 to 7 times a week (a total of 30 minutes or more), 72% stated after their participation they would do a similar amount of physical activity, with 80% responding in the 3 month survey. Before participation almost two-thirds (66%) of participants stated their children would do physical activity 4 to 7 times a week (a total of 60 minutes or more), whereas after participation 86% stated the same frequency of physical activity and 70% agreeing in the 3 month survey. F-test was employed to examine whether these differences were statistically significant. Data in Table 19 shows there was a significant difference between before and after participation in the amount of physical activity for children. The mean rating was lower after participation indicating an acknowledgement that children should do 60 minutes or more physical activity 6-7 times a week.

Table 19. Difference in physical activity

How often		N	Mean[1]	SD	F value	Sig.	*Mean difference
Would you do a total of 30 mins or more physical activity in a day?	Before	167	2.19	1.05	1.94	.14	-
	After	151	2.01	.91			
	3 month	15	1.80	1.08			
	Total	333	2.09	1.00			
Would your children do 60 mins or more physical activity in a day?	Before	122	2.10	1.35	6.88	.001	before & after
	After	107	1.49	.87			
	3 month	10	1.70	1.16			
	Total	239	1.83	1.18			

[1]Means were calculated on a five point scale: 1=6-7 times a week,2=4-5 times a week,3=2-3 times a week,4=Once a week, 5=Less than once a week.

*Significant at .05 level of probability

4.3 Difficulties in maintaining healthy life

4.3.1 Difficulties in healthy eating

Before their participation 48% stated some difficulties to choose healthy eating for their family as compared to 29% who stated similar difficulties after their participation and 53% in 3 month survey (Table 20). The most frequently cited difficulties were *kids don't like different food, too expensive,* and *not enough time to shop and cook.*

Similarly 43% stated some difficulties from eating breakfast before their participation, decreasing to 34% after participation to 21% in the 3 month survey. The main difficulties were *not enough time to eat breakfast;* and *I don't like to eat breakfast.*

Table 20. Healthy eating

Things that make difficult to	Before		After		3 month	
	Number	Percent	Number	Percent	Number	Percent
Choice healthy eating meal for family						
Nothing, I am able to put together healthy meals	83	52	106	71	7	47
Too expensive	23	15	15	10	6	39
Not enough time to shop and cook	13	8	8	5	1	7
Transport to shop	2	1	2	1	0	0
Kids don't like different foods	24	16	13	9	0	0
Don't feel confident about cooking	7	4	2	1	0	0
Other	7	4	4	3	1	7
Total	159	100	150	100	15	100
Prevents from eating breakfast for self						
Nothing, I do eat breakfast	91	57	101	66	11	79
Too expensive	2	1	3	2	0	0
Don't have breakfast foods in house	3	2	3	2	0	0
Not enough time	36	23	19	12	2	14
I don't like eating breakfast	19	12	19	12	0	0
Breakfast is not that important	1	1	1	1	0	0
Other	7	4	7	5	1	7
Total	159	100	153	100	14	100

4.3.2 Child nutrition

Data in Table 21 shows that before participation, the majority of participants (80%) stated that there was nothing preventing their children from eating breakfast; 83% expressed a similar opinion after participation and 90% supported this in the 3 month survey. However, the difficulties were identified such as: *they don't like eating breakfast,* and *not enough time*. Before their participation, 63% stated there were no difficulties to provide healthy school lunches to their kids; 76% mentioned a similar opinion after their participation and 89% in the 3 month survey. However, the noted difficulties were: *kids don't want to eat healthy food, don't know what to put in,* and *too expensive.*

Table 21. Child nutrition

Barriers	Before		After		3 month	
	Number	Percent	Number	Percent	Number	Percent
Prevent children from eating breakfast						
Nothing, they do eat breakfast	105	80	96	83	9	90
Too expensive	1	1	2	2	0	0
Don't have breakfast foods in house	1	1	2	2	0	0
Not enough time	3	2	2	2	0	0
They don't like eating breakfast	7	5	4	3	0	0
Breakfast is not that important	1	1	1	1	0	0
Other	13	10	9	7	1	10
Total	131	100	116	100	10	100
Difficult to provide healthy school lunches						
Nothing, I am able to provide healthy school lunches	74	63	80	76	8	89
Too expensive	6	5	6	6	0	0
Don't know what to put in	6	5	1	1	0	0
Kids don't want to eat healthy food	14	12	5	5	0	0
Don't have the right foods on hand	2	1	3	3	0	0
Don't have time	1	1	0	0	0	0
Other	15	13	10	9	1	11
Total	118	100	105	100	9	100
Difficult to provide healthy food for your baby						
Nothing, I am able to provide healthy food for my baby	86	78	79	81	6	74
Too expensive	3	3	3	5	0	0
Don't have the right foods or equipment at home	2	2	2	3	0	0
Not sure what to give	1	1	5	8	1	13
Don't have time	7	6	0	0	0	0
Other	11	10	2	3	1	13
Total	110	100	91	100	8	100

Before participation in the program more than three-fourths (78%) of the participants stated that they had no difficulty with providing healthy food for their babies; 81% stated a similar opinion in the after survey, and 74% in the 3 month survey (Table 21). They noted few difficulties such as *too expensive, don't have the right foods or equipment at home,* and *not sure what to give.*

4.3.3 Physical activity

Before participation, half (50%) of the participants related some difficulties with being physically active. This decreased to 40% after participation and to 33% in the 3 month survey. The most stated difficulties were; *I don't feel motivated to exercise, not enough time*, and *lack of support from family* (see Table 22).

Before their participation 28% of the participants stated they had some difficulties to make their children to be physically active; it decreased to 23% after participation and 20% in 3 month survey. The main difficulties were *children watch TV or playing computer games, don't have enough time* and *too expensive.*

Table 22.Weekly physical activity

What things make it difficult	Before		After		3 month	
	Number	Percent	Number	Percent	Number	Percent
for you to be physically active over any given week						
Nothing, I am very active	79	50	87	60	10	67
Too expensive	3	2	3	2	0	0
I don't feel motivated to exercise	33	21	30	20	2	13
Lack of support from family	6	4	4	3	0	0
Nowhere safe or private to do it	1	1	3	2	0	0
Not enough time	23	15	14	10	2	13
Other	12	7	4	3	1	7
Total	157	100	145	100	15	100
for your children to be physically active over any given week?						
Nothing, they are very active	88	72	82	77	8	80
Too expensive	2	2	3	3	0	0
Don't have enough time	3	2	2	2	0	0
They don't like exercise	0	0	2	2	0	0
Watch TV or playing computer games	11	9	9	8	0	0
Nowhere safe to do it	0	0	2	2	0	0
Others	19	15	7	6	2	20
Total	123	100	107	100	10	100

4.4 Confidence about healthy lifestyle- after participation

4.4.1 Confidence in healthy eating process

Data in Table 23 shows that more than half of the participants stated they were more confident in planning and shopping for healthy meals, finding ways to buy healthier food, cooking healthy meals, preparing healthy lunchboxes for their children and knowing about suitable foods for babies. Approximately one quarter stated they were a little more confident in these healthy eating processes.

The confidence level of participants has been sustained in all 5 domains after the 3 month survey and even further increased in the area of children's healthy lunchboxes increasing from 57% to 80%, and understanding suitable food for babies from 50% to 70%.

Table 23. Percentage distribution of the participants based on their level of confidence

Activity	Time	Yes, a lot more confident	Yes, a little more confident	About the same	No, a little less confident	No a lot less confident
Planning and shopping for foods to make healthy meals for you/ your family that you/they like?	After	53	28	17	1	1
	3 month	53	13	27	7	0
Finding ways to buy healthier foods with the money you have?	After	49	27	22	1	1
	3 month	46	40	7	7	0
Cooking healthy meals at home?	After	54	27	17	2	0
	3 month	53	33	7	7	0
Planning and preparing healthy lunchboxes and snacks for your children?	After	57	21	19	1	2
	3 month	80	10	10	0	0
Knowing what foods are suitable to give babies?	After	50	21	26	1	2
	3 month	70	10	10	10	0

4.4 .2 Confidence in physical activity

Data in Table 24 shows, more than 80% of participants were more confident in getting enough physical activity to improve good health and guiding their children to get enough physical activity to improve or maintain good health. Data from the 3 month survey shows that participants are sustaining their physical activity to maintain good health (53%), and also guiding their children to maintain good health through physical activity (64%).

Table 24. Confidence in physical activity

Activity	Time	Yes, a lot more confident	Yes, a little more confident	About the same	No, a little less confident	No a lot less confident
Getting enough physical activity to improve or maintain good health	After	59	28	13	0	0
	3 month	53	20	20	0	7
Guiding your children to get enough physical activity to improve or maintain good health	After	65	20	14	1	0
	3 month	64	27	9	0	0

4.5 Enjoyment of the Red Apple program

Data in figure 1 shows that the highest proportion (89%) of participants greatly enjoyed the program and 10% enjoyed it a little and one percent did not enjoy it at all.

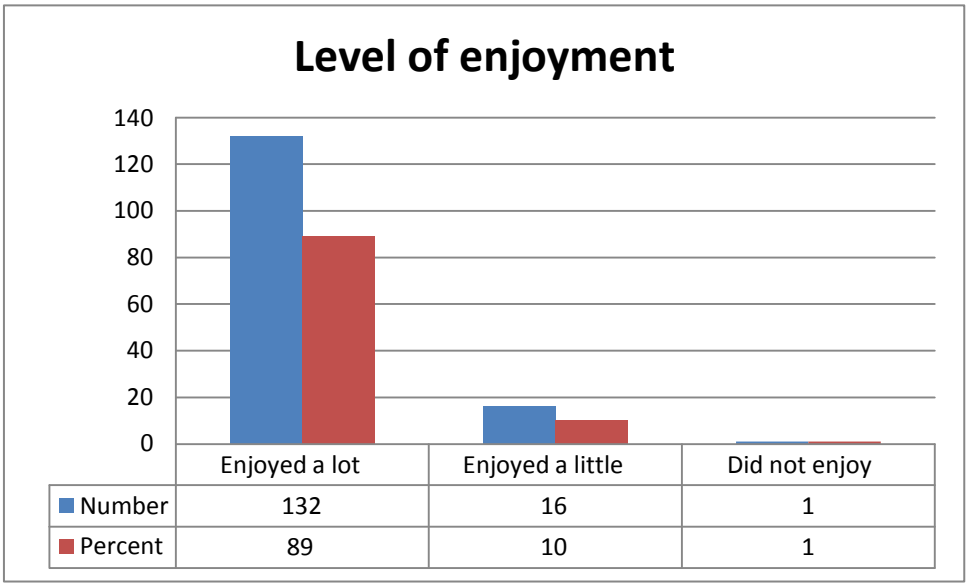


Figure 1. Level of enjoyment

4.5.1 Part of the Red Apple program that helped most

Most cited helpful aspects of this program in relation to healthy eating were: *understanding healthy eating patterns and nutrition, learning about cooking and healthy food choices, food plate activity and nutrition and food ideas for children* (Table 25). Fitness programs and aqua aerobics were very helpful with fitness and strengthening. These were the most cited helpful aspects of physical activity.

Table 25.Most helpful aspect of the program

Themes	Helpful aspect of the program	Number
Healthy eating	Understanding healthy eating patterns and nutrition	22
	Learning about cooking, healthy food choices and budgeting	11
	Food plate activity	9
	Nutrition and food ideas for children	9
	Proportion, and what calories were equal in what foods	6
	Different ideas for lunch boxes	3
	Food chart, food groups	2
	Healthy family recipes	2
	Recipes ideas	2
	The group interaction	2
	Activity with posters of fat, fibre & sugar	1
Physical activity	Fitness program	3
	Aqua aerobics was very helpful with fitness and strengthening	2
	Discuss of individual weight management strategies	1
	Exercise program and the water aerobics	1
	Physical activity for kids	1

4.5.2 Main things learned from attending this program

Participants noted that the most beneficial things learnt from attending the Red Apple program have been: healthy eating (35); kids' meals and lunchboxes (25), cooking healthy food (20), and fat and sugar content of food (Table 26).

Table 26. Three main things learned from the program

Themes	Things learned	Number
Healthy eating	Healthy eating	35
	Kids' meals and lunchboxes	25
	Cooking healthy food	20
	Fat and sugar content	14
	New recipes and ideas	9
	Nutrition	9
	Different ideas for meals	8
	Food preparation and portioning	8
	What's healthy and what's not	6
	Food Plate activity	5
	Eating fruit	3
	Drinking more water	3
	Food choices and shopping	3
	Food posters and nutrition charts	3
	Hospitality and education	3
	Price comparisons and saving money	3
	Food Groups	2
	Budgeting booklet	1
	Fussy eaters activity	1
Physical activity	Physical activities	14
	Exercising	9
Other	Socialising and meeting new people	6
	Alcohol and smoking understanding	2

4.6 Facilitator's comments

4.6.1 Eligibility criteria for participation in the courses/services

The following 12 criteria were established by the facilitators to recruit participants in the courses/services/activities.

1. Young parents
2. Play groups
3. At risk or homeless: 12 – 18 years
4. 16-21 years
5. Pregnant women
6. Parent
7. Volunteers on Centrelink and 'work for the dole'
8. Generalist Counselling issues
9. Low socio-economic/CALD
10. Life crisis or changes in the physical environment
11. Aboriginality and age
12. Over 45's unemployed < 3 months.

4.6.2 Program Content (referring to the Manual)

Table 27 identifies courses and activities for the participants in the program offered by facilitators.

Table 27.Activities included in the program

Section	Activities	Number
Basic Nutrition	Basic nutrition Part 1	16
	Basic nutrition Part 2	10
Healthy eating for children	Getting kids to eat healthy foods	1
	Packing a healthy lunch box	3
	Healthy baby foods and breastfeeding	2
Healthy Meal Planning on a Budget	What's in your kitchen	2
	Planning healthy and easy meals	5
	Finding healthy , affordable food locally	3
Healthy Cooking	Cooking and balanced meals	4
	Cooking and recipe renovation	6
Physical Activity	Introduction to Physical Activity for parents and adults	11
	Introduction to Physical Activity for youth	5
	Introduction to Physical Activity for children	4

4.6.3 Program implementation

The facilitators commented on the Manual and program resources in terms of ease of use in planning and conducting program sessions. They stated that the manual was very informative, easy to use, excellent hands on resources, materials were easy to utilize and provided clients with a broad range of tools to evaluate the level of functioning (Table 28).

Table 28. Quality of the manual

Quality of manual	Number
Very informative, detailed and straight forward	4
Easy to use, can mix and match topics and allow participants to choose what they want to do	3
The manual is developed to include health and safety tips on food handling processes in the kitchen.	2
Excellent hands on resources. Manual could have been easier with topics in tabs and all relevant sections together ie. What is needed for each lesson together in one spot eg, resources at end of each activity rather than the end of each chapter/section. Manual also rather large	2
The manual and program resources can be adapted to meet the needs of diverse participants	2
More multicultural dishes	1
The program materials are easy to utilise and provide clients with a broad range of tools to evaluate participants overall level of functioning	1

4.6.4 Relevance of program material in content and format to participant group

Facilitators stated that the materials were useful and engaging the clients, easy to follow, met the diverse needs of clients, interactive and enhanced interpersonal growth. Detailed comments were:

- *Material generated a lot of useful and engaging discussion and clients were responsive to activities*
- *The clients particularly enjoyed preparing lunch and serving it to the rest of the group*

- *Easy to follow recipes*
- *The content was enhanced with the inclusion of information about bush tucker*
- *Excellent however culturally diverse clients need content that includes them such as different nationality food wrappers etc. in the food box*
- *Very relevant as participants were not well aware of the nutritional groups and daily intake requirements*
- *The interactional nature of the sessions fostered mutual aid and interpersonal growth throughout the life of the group*
- *Handing out recipes for traditional Indigenous meals addressed the limitation*
- *A young participant (age 7) had no difficulty making sense of the material utilised in the healthy lunchbox session. Healthy lunchboxes was good due to mums having school aged children and youth.*

4.6.5 Difficulties in conducting this program

Most cited difficulties were:

a. Securing the regular participants for the sessions (Youth Care is an emergency accommodation facility and so clients are not regular)
b. Most of our participants were illiterate
c. Participants were reluctant to share their Star Tool chart information
d. Having the after forms filled out if parents don't attend
e. The beginning evaluation program is hard to follow and colour coding does not aid with participants with low literacy
f. As an older practitioner, it was important to monitor the impact of different communication styles throughout the sessions.

4.6.6 Suggestion to changes or improves the quality of the program

Most cited suggestions were:

a. Less paperwork for people seeking to complete the program in one day
b. Maybe a list of which forms are needed to fill out before the program starts and placed in manual
c. Sessions held closer together for attendance eg. All in one week or one session per week etc. (were held every 2 weeks)
d. CALD appropriate food examples if possible. Manual to have individual sections able to be separated for session use
e. Different colour coding/easier to understand evaluation forms.

4.7 Qualitative (provider) findings

This section presents the qualitative findings from a set of interviews conducted and transcribed by another member of the evaluation team who has not done the analysis. Initially, Data was manually explored to examine and aggregated to arrive at the major themes of working relationships between organizations, effectiveness of the program and effectiveness of the tools. These were sorted into groups of information repositories known as

'nodes' so that main nodes could be generated in NVIVO 10. Data were then analysed in depth so that specific statements relating to the nodes could be grouped into the nodes by manually coding the themes into the nodes. Following this, in-depth analysis was undertaken. Where appropriate real transcript statements have been provided within the following findings and discussion or clarity and reader information. This analysis is the result of only two focus groups of 8 participants and therefore cannot be generalised in any way. However it can be used as an indication in order to support the quantitative findings presented elsewhere in this report.

4.7.1 Provider themes (n-8) Maryborough: Focus group findings

Findings from the service providers did not provide any surprising outcomes. Responses suggested that the programs were relevant and appropriate for the target groups and that participants did change behaviours for the better in relation to shopping, food preparation and physical activity. It was noted that in some cases participants actually became more self-reliant in relation to healthy eating and found ways to initiate their own vegetable gardens in creative ways with pots in small areas around their homes. Given the low SES status of the region, transport was identified as a problem for some participants trying to attend workshops as they were dependent on public transport. Prior to the programs , the cost of food was perceived as being an issue however after being taken on shopping expeditions many participants began purchasing more healthy options and started to read the labels on prepared food items in the supermarkets.

4.7.2 Working relationships

Working with other organizations external to their own raised some issues such as resistance. The ability to work together depended on physical capacity that directly related to who in organizations was available at the time. *CALD – needs improvement to food samples.*

4.7.3 Improvement needed

In some areas/groups, literacy was a major issue – Providers suggested that they really needed to have more than one person facilitating/present when this was the case. This comment may also reflect the study demands of completing questionnaires following program sessions. *A PowerPoint presentation for some of the materials, such as the Virtual Supermarket, would be helpful as an additional resource, also more Flip Charts*

4.7.4 Reactions to the manual

Overall, the manual was popular, however, it has low impact in terms of way of doing business. The format of the manual was well received ... *Great visuals.*

Comments suggested that providers learned new and relevant information although this was the targeted outcome of the project. For example.. *Has made us more "savvy" and aware about social marketing* and; *helped us understand; more confident about asking people to "commit"* and *"I enjoyed it"*.

The length and duration of the program sessions were seen as being appropriate and relevant *...Activity timeframes worked great for program delivery to our clients formed a walking group; we encouraged perseverance.*

Some discussion focussed around cultural and target group differences in terms of specific interests for food labelling, eg: Aboriginal and Torres Strait Islanders appeared to be particularly interested in Carbohydrates in foods.

Other comments in relation to outcomes from the programs included *....General consensus that the virtual supermarket approach and focus on fat, sugar and simple choices, least to most exercise, etc – were very effective in getting the basic messages across to assist people in their food choices. Simplify facilitator materials as much as possible.* While some used the Star tool and it was noted to be easy for younger participants, most were not willing to share information. Other issues raised by providers were those of literacy and cost for participants. The promotional items were liked and used as incentives by facilitators as well as rewards for participation in program and *There was lots of flexibility in how you can deliver the course content and that is very important to tailor to each group.*

4.7.5 Effectiveness of CBSM

The perceived effectiveness of the Red Apple program and the CBSM approach was mostly seen as being positive by providers. Comments included: *clients loved them; good to encourage and reward* and *Clear, simple messages; not too many was good for this target group. The range of groups this program covers is awesome-starting with people when they are young.*

The recipe Manual was well received by providers and participants *....so we copied them, also expanded with recipes from other sources, participant.* It appears that participants and providers became very creative during the program. For example, *One group made and printed a booklet of recipes as a gift* and *One group made an alternative book sourcing recipes from Kukubut (Food- Good feed)* and *Some groups invented extra recipes of their own* and *Some used vouchers (many donated by local businesses).*

It was noted that more culturally appropriate recipes should be included into the manual *..Need to include some more diverse culturally appropriate food eg: rice as staple rather than bread. ...One bought a cheap slow cooker as door prize drawn at the last session – name went in every time they attended, so the more times they attended, the greater chance of winning – participants really liked this.*

Some providers were able to specifically target "incentives" to the individual needs of participants–(for example one *single mum in small unit was given a $50 voucher to hardware/nursery to purchase pot, soil, seeds to grow tomatoes and veg on her verandah.*

4.7.6 Outcomes

Providers suggested that in order for the programs to be more useful or effective providers needed first to have established relationships with clients. For example, ... *It was important to have an already established relationship with the clients and that although cold calling was implemented this type of engagement did not bring those to the group.* It was seen as being necessary at times in program presentations to use incentives to further engage the participants.

Provider comments were positive about the programs and identified high levels of participant engagement and satisfaction evidenced by comments such as; *Generated a lot of discussion and interest amongst clients to discuss food – very interactive... We want more of this next year*. Free handouts were appreciated by providers and participants *people liked 'freebies' that we used as rewards for participation- for example Bags, stickers, Frisbees, water bottles, shopping lists, fridge magnets, free lunch voucher at school for good participation.*

Some comments directly related to the younger participants and the younger mothers. For example*; Most young people liked it, but some were bored as they found the forms difficult to fill out a*nd; *Perhaps for young people the program would work more for them if they were able to get straight into the cooking.*

While the younger mothers identified difficulties in relation to cooking meals and caring for babies– *difficult to cook whilst caring for children,* there were positive outcomes noted by providers such as; *Young Mum's groups went really well-young women changed to healthier foods for their kids;* and... *Young Mums: helped cook home-made baby food and taste test went down well – demonstrated "how to" and discussed ways to make preparation at home more achievable as well as....those who did food label reading found it useful – but only touched on it.*

4.7.7 Physical activity

It appears that all participants enjoyed the physical activities presented which ranged from Indigenous games using the Indigenous games manual to 'Bollywood' dancing. Providers indicated that people were surprised to find that physical activity does not necessarily mean sport. Creativity on the part of providers meant higher levels of engagement and was achieved by incentives that were chosen to match the client's needs for example – *vegetable pots for patio garden; pool passes; sponsorship; door prizes.* Other satisfaction evidences included; *3 Ladies actually signed up for aqua aerobics/stopped smoking/joined the gym. ....It seems there was a shift in their thinking in regards to exercise.....One lady with children started a patio garden in pots in her small place.....One lady who experienced mental health issues bought pool passes.*

4.8 Summary

The programs were favourably received and implemented by providers who noted high levels of acceptance, changed behaviours of participants in relation to shopping, food choices, and

cooking healthier meals still evidenced 3 months later. Participant views about physical activity changed according to provider comments and more self-reliant behaviours in relation to health food and lifestyle choices became evident.

5 DISCUSSION

The Red Apple program offered a variety of activities such as basic nutrition, healthy eating for children, healthy meal planning on a budget, healthy cooking, and physical activity in 20 communities (n-176). The main notion to emerge from both the qualitative and quantitative findings was that people are now more aware of healthy food choices for themselves and their children and that together with regular physical activity help to maintain a healthy lifestyle. The barrier of cost was able to be minimised in some cases as a result of the shopping activities. Participants now appear to better understand the benefits of participating in regular physical activity as well as the importance of selecting healthy fresh food, eating breakfast and cooking meals at home rather than eating fast food. The main outcomes of the program are discussed below:

5.1 Changes in knowledge of healthy eating

After participation in the program, the highest proportion of participants indicated apples (99%), water (97%), eggs (89%), milk and cheese (89%), grilled fish (89%), and raw unsalted nuts (83%) are the healthy food to eat. Data also shown that after participation in the program the participants agreed on, *home cooked meals can be more affordable than takeaway meals*. They recognized the importance of *eating breakfast* to maintain a healthy life. Qualitative findings of providers supported this as an outcome of the different aspects of the program. These data show the program might have some influence on increasing the participants' knowledge in selecting and identifying healthy foods. This in turn validates findings by researchers who explored links between low income families and support and information provision (65, 66).

5.2 Changes in eating behaviour

There was an insignificant increase in eating patterns in the after participation of the participants when preparing and cooking meals from ingredients at home and eating less takeaway/fast food. Eating breakfast insignificantly increased from 69% before the participation to 75% after their participation in the program, and continued to increase 86% in 3 month. Furthermore, vegetables and fruit consumptions among the participants have also been increased from 5-6 times a week to once a day. A healthy diet including fruit and vegetables is considered by nutritionists and health providers to be needed in order to sustain healthy lifestyle and to reduce the risk of cardiac disease and cancers (52, 53). Consumption of sugary drinks decreased significantly; similarly those participating increased their water consumption. This suggests that the program has had some effect on participants' willingness to change their food habits.

5.3 Changes knowledge in physical activity

Understanding about the importance of physical exercise increased. F test showed that there was significant improvement in knowledge levels about the importance of exercise and level of physical activity. The mean rating of participants after their participation on *'For an adult, exercise doesn't have to be done all at one time-3 blocks of 10 minutes per day are okay'* differed significantly from their before participation responses. There was a higher mean rating (4.52) after participation, indicating strong agreement with this statement. Similarly, the mean rating of participants after participation (4.31) on *'Regular moderate physical activity that makes you breathe more heavily can improve your health'* differed significantly from their before participation response (3.98) in the program. This validated responses of service providers who stated that participants' activity levels increased and participants in some cases initiated continuous activity with various community groups. This data confirms a positive benefit on health and reducing the risk of illness as identified by other researchers (48) who likewise have concluded that physical activity reduces the risk of cardiovascular disease and diabetes and may reduce the incidence of some cancers, most notably colon and breast cancers.

The highest proportion of participants indicated that 1 hour to 2 hours of physical activity are necessary for a child per day. This finding supports the Department of Health and Aging report (20) that stated that every child needs at least 60 minutes of moderate to vigorous intensity physical activity per day and should not spend more than two hours using electronic media for entertainment during daylight hours (20). Qualitative findings also supported this notion.

5.4 Changes in behaviour relating to physical activity

Before participation in the program, more than three-fifths (63%) of the participants stated they would do physical activity 4 to 7 times (a week a total of 30 minutes or more), 72% stated after their participation they would do similar amount of physical activity, as did 80% in the 3 month post survey. This incremental result shows the program changed the behaviour of participants to do more physical activity. Similarly participants have said that before participation in the program children should do physical activity 4-5 times a week, however after participation they stated that the children should do physical activity 6-7 times a week. This amount of physical activity is necessary for the children to maintain their healthy lifestyle. Lack of physical activity is reported to account for 6.6% of the burden of disease and is the fourth highest after tobacco, high blood pressure and obesity (1, 20).

5.5 Confidence about healthy lifestyle

Healthy eating: The majority of participants noted that they are now more confident in planning and shopping for healthier meal options, finding ways to buy healthier type foods, cooking healthy meals at home, planning and preparing healthy lunchboxes for children and now knowing more about the most suitable food for babies. Confidence levels of participants has been sustained in all 5 domains after the 3 month survey with further increases in relation

to children's healthy lunchboxes (increasing from 57% to 80%), and understanding suitable food for babies (from 50% to 70%).

Physical activity: Participants are now more confident about doing enough physical activity to improve their health and encourage their children in exercise programs to improve and maintain good health. These confidence levels sustained 3 months after participation. This result signifies the positive impact of the program on participants in maintaining healthy lifestyle. Results support findings by Jarrett et al. (2011) who revealed seven caregiver management strategies that promoted child physical activity, despite multiple neighbourhood barriers. These included ecological appraisal, boundary enforcement, chaperonage, kin-based play groups, collective supervision, local resource brokering, and extra-local resource brokering. These findings provide important substantive and theoretical insights on the relationship between caregiver practices, neighbourhood social context, and child physical activity (57).

5.6 Difficulties associated with making healthy choices

5.6.1 Healthy eating

Identifying the difficulties associated with healthy eating for families increased and participants are now better able to recognize issues such as expense, not enough time to shop and cook as well as children not liking different foods. The cost of healthy foods has risen more than the cost of some less nutritious foods, so that the latter are now more affordable (81). However, these are not acute problems and could be easily managed by most participants as a result of the programs. The percentage of people now eating breakfast increased with the most cited barrier of 'not enough time' decreased as a result of time spent planning.

5.6.2 Physical activity

Most cited difficulties in relation to physical activity were: no motivation to exercise, lack of support from family, and not enough time to participate in physical activity. Prices influence behaviour and choice of the low socio-economic families; however, this should not be a barrier to participate in physical activity or access to healthy eating (80).

Commonly stated difficulties for the children were: they watch too much TV and/or play games in computer and thus they don't have enough time to do physical activity. This is congruent with findings of Chang and his associate (86, 87).They stated the lack of personal time is an acute barrier to undertake physical activity. Few participants stated that the physical activity for the children is too expensive and this statement is similar to Harrison et al.(119). Harrison and associates indicated that cost and availability are barriers for rural and remote communities.

5.7 Program materials

Most facilitators stated that the material generated a lot of useful and engaging discussion and clients were responsive to activities; the clients particularly enjoyed preparing lunch and

serving it to the rest of the group; the content was enhanced with the inclusion of information about bush tucker; very relevant as participants were not well aware of the nutritional groups and daily intake requirements; the interactional nature of the sessions fostered mutual aid and interpersonal growth throughout the life of the group. However, culturally diverse clients need content that includes them such as different nationality food wrappers etc. in the food box.

6 RECOMMENDATIONS and SUMMARY

6.1 Recommendations

The key messages (behaviours) reinforced throughout the Manual, the program and it's resources are based on current recommendations largely sourced from the Australian Guide to Healthy Eating (AGTHE), Food Plate as well as the Physical Activity Guidelines from the Department of Health and Ageing. Main recommendations focussed on;

- More multi-cultural food samples and recipes would be good for some groups such as Rice based meals-to improve diversity
- It would be good not to have such intensive evaluation paperwork in a future program but do keep some evaluation going
- Inclusion of specific content for older people
- The program would work interesting for some young people if they were able start with the cooking.
- Simplify facilitator materials as much as possible.

6.2 Summary

Community Service Providers were very positive in their reception of the Red Apple Pilot Program and in implementing healthy lifestyles information as part of an holistic approach to supporting clients as were the program recipients. The Hervey Bay Neighbourhood Centre and Uniting Care Community are very keen to see the Red Apple Program continue in a sustainable format and are currently making every effort to this end. This includes applying for shared Intellectual Property rights to the Program Manual and materials to Department of Health Queensland, which is currently under review by the F&CIMU (Finance and Contract Management Unit) department in Brisbane. If successful, it is hoped the Project partners can apply for further funding from other Government bodies to continue implementation of the Red Apple Program on a wider scale.

Comments indicated that participants' increased their knowledge levels about basic nutrition, healthy eating for children, healthy meal planning on a budget, healthy cooking, and physical activity. The self-reported benefits to participants involved in the program are summarized as follows:

f) Improved knowledge and lifestyle skills
g) the adoption of healthy eating behaviours
h) Improved ability to adopt healthy physical activity behaviour

i) Increased parent ability to establish healthy eating and physical activity/exercise patterns among children early in life
j) Increased self-reliance in relation to aspects of health food choices.

Some service providers who delivered the program now feel competent enough to reshape the Red Apple program for their own community by utilising the systematic feedback on what is useful and what is not useful for them. The evaluation results indicated that the program has had a positive effect on the quality of life of the participants.

Facilitators stated that the materials used in the programs were useful and relevant to the participants and that they would use the program again. Some indicated that they would need to make the information more relevant to specific target groups such as elderly or Aboriginal communities. It would be useful to test the findings from this study in a wider community with more qualitative feedback from the community participants in the program. Overall participants engaged well in all activities and were willing to complete the repeated evaluations due to the applicability of the tools used.

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8 APPENDICES

8.1 Appendix A. List of participating agencies in the Red Apple Pilot Program

- ✓ Migrant Settlement Program- assistance for new non-English speaking migrants & refugees
- ✓ Play With Your Kids Playgroup Group 1- playgroup for low socio-economic background parents
- ✓ Family Connect Maryborough Young Mums Group- young mums from low socio-economic background
- ✓ Reconnect & Youth care Services- youth at risk and youth in who need emergency housing
- ✓ SVDP Child & Family Program- referrals from child safety- parents at risk of losing children or just received children back from child safety
- ✓ Glendyne School- alternative education for youth especially youth at risk of disengaging from education system
- ✓ Fraser Coast TESS Youth Connections- youth at risk
- ✓ Maryborough Neighbourhood Centre- low socio-economic background
- ✓ Pace Parent & Community Engagement Program- parents from Aboriginal & Torres Strait Islander background
- ✓ Play With Your Kids Playgroup Group 2
- ✓ Play With Your Kids Playgroup Group 3
- ✓ HBNC Volunteers Group- on work for the dole/ community service
- ✓ Project 40 Employment Program- over 40's recently unemployed
- ✓ Eidsvold Traditional Owners Group- Aboriginal & Torres Strait Islander background low socio-economic
- ✓ Munduberra Yemeni Group- Aboriginal & Torres Strait Islander background low socio-economic
- ✓ Wulli Wulli Group Eidsvold- Aboriginal & Torres Strait Islander background low socio-economic
- ✓ Gayndah Youth Service- youth at risk
- ✓ Wakka Wakka Group Eidsvold- Aboriginal & Torres Strait Islander background low socio-economic
- ✓ Munduberra Emergency Relief Program- low socio-economic clients
- ✓ Uniting Care Community Gayndah Counselling Service- low socio-economic clients
- ✓ Epic Support Group Biggenden- unemployed
- ✓ Biggenden Mums Morning Tea Group- low socio-economic

8.2 Appendix B. Evaluation Instruments

The Red Apple Program

Before Program Participant Questionnaire

TO BE COMPLETED BY THE FACILITATOR:

Organisation: _____

Group Code: _____ Start Date:_____Participant Code: _____

1. Are you Male Female ?
2. Your age in years? _____
3. Do you identify as Aboriginal and/or Torres Strait Islander?
   Yes, Aboriginal Yes, Torres Strait Islander Yes, both No, neither
4. Were you born in Australia? or Another country?
   If so, which country? _____
5. Do you use a language other than English at home? Yes No
   If yes, which language? _____
6. Are you: Single, with no children? Single, with children? How many? _____
   Married, or have a partner, but no children? Married, or have a partner, and have children? How many? ____
   Married, or have a partner, but no children? Married, or have a partner, and have children? How many?____

HEALTHY EATING

7. Which of the following foods would you consider to be healthy choices? Please tick.

Apples Sultanas a packet of chips Lollies, chocolate Fried chicken Eggs Milk and cheese
Weet Bix Nutrigrain Bread, pasta and rice Cakes and biscuits Grilled fish Raw unsalted nuts
Baked Beans Water Soft drink Cordial Sports or energy drink

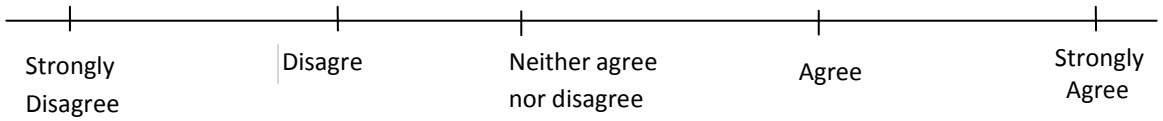
8. Home cooked meals can be more affordable than takeaway meals. Please circle

Strongly Disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree

9. It is important for people to eat breakfast. Please circle

Strongly Disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree

10. It is important that babies are breastfed. Please circle



How often, do you usually:(Please tick one box only)	6-7 times a week	4-5 times a week	2-3 times a week	Once a week	Less than once a week
11. Prepare and cook meals from ingredients you have at home?					
12. Eat take-away or "fast foods" (eg: fish & chips, hamburgers, pizza, meat pies, sausage rolls, fried chicken, etc)?					
13. Eat breakfast?					

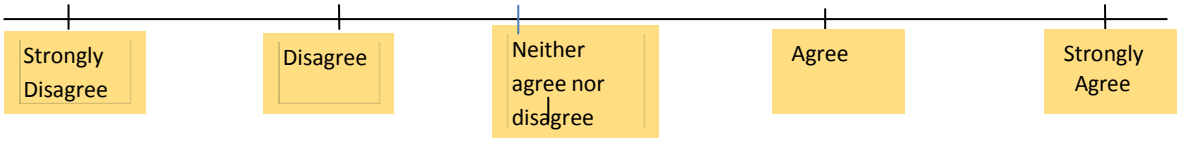
How often do you usually: (Please Tick one box only)	More than once a day	Once a day	5-6 times a week	3-4 times a week	1-2 times a week	Less than once a week
14. Eat a meal with 2 or more different vegetables? (fresh, frozen or tinned?)						
15. Eat fruit? (Fresh, frozen, tinned or dried)						

16. How many glasses of sugary drinks (cordial, flavoured milk, soft drink, alcohol) do you usually have each day? _____

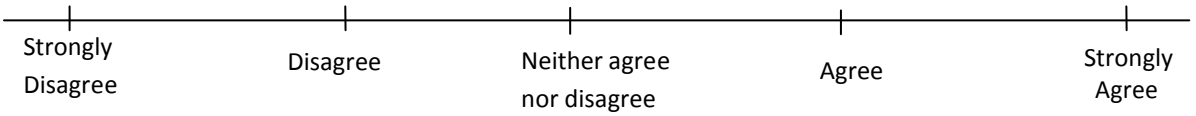
17. How many glasses of water do you usually drink each day? _____

PHYSICAL ACTIVITY

18. Exercise doesn't have to be done all at one time – 3 blocks of 10 minutes per day are okay. Please circle.



19. Regular moderate physical activity that makes you breathe more heavily can improve your health. Please circle.



20. Please tick the activities you believe could count as physical activity to improve your health:

House cleaning Walking to the local shop for milk and paper
Walking to and from school with the children Walking up stairs Gardening
A walk around the block with the dog Mowing the lawn Cycling

21. How much physical activity do children need each day? Tick one box only

30 minutes 1 hour 2 hours Don't know

(Please tick one box only)	6-7 times a week	4-5 times a week	2-3 times a week	Once a week	Less than once a week
22. How often would you do 30 minutes or more of physical activity in a day? (Things that make you breathe more heavily – can include things like walking, housework, gardening, climbing stairs as well as playing sport)					
23. How often would *your children* do 60 minutes or more of physical activity in a day? (Things that make them breathe more heavily, like walking, playing at home, playing sport, riding a bike, etc)					

	THINGS THAT MAKE HEALTHY CHOICES DIFFICULT FOR YOU (Please tick all that apply) *Note to Facilitators*: Please cross out any questions which do not apply to your participants or is a topic you are not doing in your program.						
	Healthy Eating						
24. What things make it difficult to put together a healthy meal for your family?	Nothing, I am able to put together healthy meals	Too expensive	Not enough time to shop and cook	Transport to shop	Kids don't like different foods	Don't feel confident about cooking	Other
	If other, what things?						
25. What prevents you from eating breakfast?	Nothing, I do eat breakfast	Too expensive	Don't have breakfast foods in the house	Not enough time in the mornings	I don't like eating breakfast	Breakfast is not that important	Other
	If other, what things?						
	Nutrition for Kids						
26. What prevents your children from eating breakfast?	Nothing, they do eat breakfast	Too Expensive	Don't have breakfast foods in the house	Not enough time in the mornings	They don't like eating breakfast	Breakfast is not that important	Other

	If other, what things?						
27. What things make it difficult to provide healthy school lunches for your children?	Nothing, I am able to provide healthy school lunches	Too expensive	Don't know what to put in	Kids don't want to eat healthy foods	Don't have the right foods on hand	Don't have time	Other
	If other, what things?						
28. What things make it difficult to provide healthy foods for your baby?	Nothing – I am able to provide healthy foods for my baby	Too expensive	Don't hav the righ foods o equipment a home	Not sure what to give	Don't have time	Other	
	If other, what things?						
	Physical activity						
29. What things make it difficult for you to be physically active over any given week?	Nothing – I am very active	Too expensive	I don't feel motivated to exercise	Lack of support from family	Nowhere safe or private to do it	Not enough time	Other
	If other, what things?						
30. What things make it difficult for *your children* to be physically active over any given week?	Nothing, they are very active	Too expensive	Don't have enough time	They don't like exercise	Watching TV or playing computer games	Nowhere safe to do it	Other

Thank you for completing these questions!
Please give this form to your facilitator when you have finished.

After Program Participant Evaluation

TO BE COMPLETED BY THE FACILITATOR:

Facilitator Name: _____ Attendance: _____of _____possible sessions

Group Code: _____Participant Code: _____

1. Overall, how did you enjoy the Red Apple program? Please tick

Enjoyed a lot Enjoyed a little Did not enjoy

2. What part of the Healthy Choices Program helped you the most?

_____

_____

3. What would you say were the main three things you learned from attending this program?

1._____

2._____

3._____

HEALTHY EATING

4. Which of the following foods would you consider to be healthy choices? Please tick.

Apples Sultanas a packet of chips lollies, chocolate Fried chicken Eggs
Milk and cheese Weet Bix Nutrigrain Bread, pasta and rice Cakes and biscuits Grilled fish
Raw unsalted nuts Baked Beans Water Soft drink Cordial Sports or Energy drink

5. Home cooked meals can be more affordable than take away meals. Please circle.

Strongly Disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree

6. It is important for people to eat breakfast. Please circle

Strongly Disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree

7. It is important that babies are breastfed. Please circle

Strongly Disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree

How often, do you usually: (Please tick one box only)	6-7 times a week	4-5 times a week	2-3 times a week	Once a week	Less than once a week
8. Prepare and cook meals from ingredients you have at home?					
9. Eat take-away or "fast foods" (eg: fish & chips, hamburgers, pizza, meat pies, sausage rolls, fried chicken, etc)?					
10. Eat breakfast?					

How often do you usually: (Please Tick one box only)	More than once a day	Once a day	5-6 times a week	3-4 times a week	1-2 times a week	Less than once a week
11. Eat a meal with 2 or more different vegetables? (fresh, frozen						
12. Eat fruit? (Fresh, frozen, tinned or dried)						

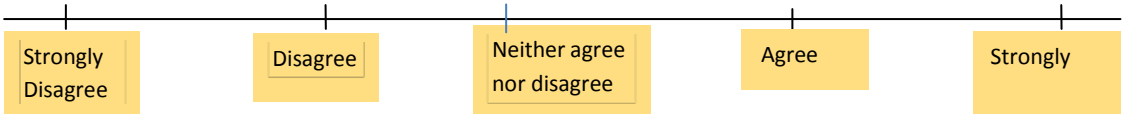
13. How many glasses of sugary drinks (cordial, flavoured milk, soft drink, alcohol) do you usually drink each day? _____

14. How many glasses of water do you usually drink each day? _____

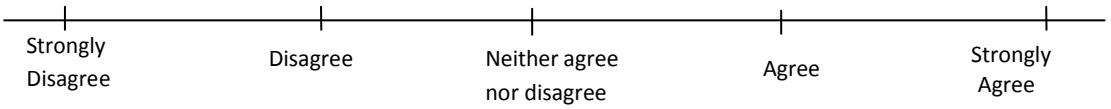
Since completing the Red Apple program, are you more confident about: (please tick one box only)	Yes, a lot more confident	Yes, a little more confident	About the same	No, a little less confident	No, a lot less confident
15. Planning and shopping for foods to make healthy meals for you/ your family that you/they like?					
16. Finding ways to buy healthier foods with the money you have?					
17. Cooking healthy meals at home?					
18. Planning and preparing healthy lunchboxes and snacks for your children?					
19. Knowing what foods are suitable to give babies?					

PHYSICAL ACTIVITY

20. Exercise doesn't have to be done all at one time – 3 blocks of 10 minutes per day are okay. Please circle



21. **Regular moderate physical activity that makes you breathe more heavily can improve your health. Please circle**



22. **Please tick the activities you believe could count as physical activity to improve your health:**
House cleaning Walking to the local shop for milk and paper Walking to and from school with the children Walking up stairs Gardening A walk around the block with the dog Mowing the lawn Cycling

23. **How much physical activity do children need each day? Tick one box only**
30 minutes 1 hour 2 hours Don't know

How often: (Please tick one box only)	**6-7 times a week**	**4-5 times a week**	**2-3 times a week**	**Once a week**	**Less than once a week**
24. **Would you do 30 minutes or more of physical activity in a day? (Things that make you breathe more heavily – can include things like walking, housework, gardening, climbing stairs as well as playing sport)**					
25. **Would *your children* do 60 minutes or more of physical activity in a day? (Things that make them breathe more heavily, like walking, playing at home, playing sport, riding a bike, etc)**					

Since completing the Red Apple program, are you more confident about: (please tick one box only)	**Yes, a lot more confident**	**Yes, a little more confident**	**About the same**	**No, a little less confident**	**No, a lot less confident**
26. **Getting enough physical activity to improve or maintain good health?**					
27. **Guiding your children to get enough physical activity to improve or maintain good health?**					

Now that you have completed the Red Apple program are there still things that make healthy choices difficult for you? (Please tick all that apply)

Note to Facilitators: Please cross out any questions which do not apply to your participants or is a topic you are not doing in your program.

Healthy Meals

28. **What things make it difficult to put together a healthy meal for your family?**	Nothing, I am able to put together healthy meals	Too expensive	Not enough time to shop and cook	Transport to shop	Kids don't like different foods	Don't feel confident about cooking	Other
If other, what things?							

29. **What prevents you from eating breakfast?**	Nothing, I do eat breakfast	Too expensive	Don't have breakfast foods in	Not enough time in the	I don't like eating breakfast	Breakfast is not that importa	Other

			the house	mornings		nt	
If other, what things?							
Nutrition for Kids							
30. What prevents your children from eating breakfast?	Nothing, they do eat breakfast	Too Expensive	Don't have breakfast foods in the house	Not enough time in the mornings	They don't like eating breakfast	Breakfast is not that important	Other
If other, what things?							
31. What things make it difficult to provide healthy school lunches for your children?	Nothing, I am able to provide healthy school lunches	Too expensive	Don't know what to put in	Kids don't want to eat healthy foods	Don't have the right foods on hand	Don't have time	Other
If other, what things?							
32. What things make it difficult to provide healthy foods for your baby?	Nothing – I am able to provide healthy foods for my baby	Too expensive	Don't have the right foods or equipment at home	Not sure what to give	Don't have time	Other	
If other, what things?							
Physical activity							
33. What things make it difficult for you to be physically active over any given week?	Nothing – I am very active	Too expensive	I don't feel motivated to exercise	Lack of support from family	Nowhere safe or private to do it	Not enough time	Other
If other, what things?							
34. What things make it difficult for your children to be physically active over any given week?	Nothing, they are very active	Too expensive	Don't have enough time	They don't like exercise	Watching TV or playing computer games	Nowhere safe to do it	Other
If other, what things?							

35. Do you have any comments or suggestions for improving the Red Apple program?

_____

_____

Thank you for completing these questions!

Please mail this form using the self-addressed envelope.

3 Months After Program Participant Evaluation

TO BE COMPLETED BY THE FACILITATOR:

Facilitator Name: _____ Attendance: _____of _____possible sessions

Group Code: _____Participant Code: _____

HEALTHY EATING

1. Which of the following foods would you consider to be healthy choices? Please tick.

Apples Sultanas a packet of chips lollies, chocolate Fried chicken Eggs Milk and cheese Weet Bix Nutrigrain Bread, pasta and rice Cakes and biscuits Grilled fish Raw unsalted nuts Baked Beans Water Soft drink Cordial Sports or Energy drink

2. Home cooked meals can be more affordable than take away meals. Please circle.

Strongly Disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree

3. It is important for people to eat breakfast. Please circle

Strongly Disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree

4. It is important that babies are breastfed. Please circle

Strongly Disagree | Disagree | Neither agree nor disagree | Agree | Strongly Agree

How often, do you usually: (Please tick one box only)	6-7 times a week	4-5 times a week	2-3 times a week	Once a week	Less than once a week
5. Prepare and cook meals from ingredients you have at home?					
6. Eat take-away or "fast foods" (eg: fish & chips, hamburgers, pizza, meat pies, sausage rolls, fried chicken, etc)?					
7. Eat breakfast?					

How often do you usually: (Please Tick one box only)	More than once a day	Once a day	5-6 times a week	3-4 times a week	1-2 times a week	Less than once a week
8. Eat a meal with 2 or more different vegetables? (fresh, frozen or tinned?)						
9. Eat fruit? (Fresh, frozen, tinned or dried)						

10. How many glasses of sugary drinks (cordial, flavoured milk, soft drink, alcohol) do you usually drink each day? _____

11. How many glasses of water do you usually drink each day? _____

3 months after completing the Red Apple program, are you more confident about: (please tick)	Yes, a lot more confident	Yes, a little more confident	About the same	No, a little less confident	No, a lot less confident
12. Planning and shopping for foods to make healthy meals for you/ your family that you/they like?					
13. Finding ways to buy healthier foods with the money you have?					
14. Cooking healthy meals at home?					
15. Planning and preparing healthy lunchboxes and snacks for your children?					
16. Knowing what foods are suitable to give babies?					

PHYSICAL ACTIVITY

17. Exercise doesn't have to be done all at one time – 3 blocks of 10 minutes per day are okay. Please circle.

Strongly Disagree | Disagre | Neither agree nor | Agree | Strongly

18. Regular moderate physical activity that makes you breathe more heavily can improve your health. Please circle.

Strongly Disagree | Disagre | Neither agree nor disagree | Agree | Strongly Agree

19. Please tick the activities you believe could count as physical activity to improve your health:

House cleaning | Walking to the local shop for milk and paper | Walking to and from school with the children | Walking up stairs | Gardening | A walk around the block with the dog | Mowing the lawn | Cycling

20. **How much physical activity do children need each day? Tick one box only**

30 minutes 1 hour 2 hours Don't know

How often: (Please tick)	6-7 times a week	4-5 times a week	2-3 times a week	Once a week	Less than once a week
21. Would you do 30 minutes or more of physical activity in a day? (Things that make you breathe more heavily – can include things like walking, housework, gardening, climbing stairs as well as playing sport)					
22. Would *your children* do 60 minutes or more of physical activity in a day? (Things that make them breathe more heavily, like walking, playing at home, playing sport, riding a bike, etc)					

3 months after completing the Red Apple program, are you more confident about: (please tick)	Yes, a lot more confident	Yes, a little more confident	About the same	No, a little less confident	No, a lot less confident
23. Getting enough physical activity to improve or maintain good health?					
24. Guiding your children to get enough physical activity to improve or maintain good health?					

3 months after completing the Red Apple program are there still things that make healthy choices difficult for you? (Please tick all that apply)

Note to Facilitators: Please cross out any questions which do not apply to your participants.

Healthy Eating

25. What things make it difficult to put together a healthy meal for your family?	Nothing, I am able to put together healthy meals	Too expensive	Not enough time to shop and cook	Transport to shop	Kids don't like different foods	Don't feel confident about cooking	Other
If other, what things?							
26. What prevents you from eating breakfast?	Nothing, I do eat breakfast	Too expensive	Don't have breakfast foods in the house	Not enough time in the mornings	I don't like eating breakfast	Breakfast is not that important	Other
If other, what things?							

Nutrition for Kids							
27. What prevents your children from eating breakfast?	Nothing, they do eat breakfast	Too Expensive	Don't have breakfast foods in the house	Not enough time in the mornings	They don't like eating breakfast	Breakfast is not that important	Other
If other, what things?							

28. What things make it difficult to provide healthy school lunches for your children?	Nothing, I am able to provide healthy school lunches	Too expensive	Don't know what to put in	Kids don't want to eat healthy foods	Don't have the right foods on hand	Don't have time	Other
If other, what things?							

29. What things make it difficult to provide healthy foods for your baby?	Nothing – I am able to provide healthy foods for my baby	Too expensive	Don't have the right foods or equipment at home	Not sure what to give	Don't have time	Other
If other, what things?						

Physical activity							
30. What things make it difficult for you to be physically active over any given week?	Nothing – I am very active	Too expensive	I don't feel motivated to exercise	Lack of support from family	Nowhere safe or private to do it	Not enough time	Other
If other, what things?							

31. What things make it difficult for your children to be physically active over any given week?	Nothing, they are very active	Too expensive	Don't have enough time	They don't like exercise	Watching TV or playing computer games	Nowhere safe to do it	Other
If other, what things?							

Thank you for completing these questions