The feasibility, acceptability, and potential efficacy, of an after-school homework club, physical activity, and sport program for primary school girls: the Wollongong Sport Program proof-of-concept trial

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THE FEASIBILITY, ACCEPTABILITY, AND POTENTIAL EFFICACY, OF AN AFTER-SCHOOL HOMEWORK CLUB, PHYSICAL ACTIVITY, AND SPORT PROGRAM FOR PRIMARY SCHOOL GIRLS: THE WOLLONGONG SPORT PROGRAM PROOF-OF-CONCEPT TRIAL

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JESSICA RYAN

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DECLARATION

I certify that the work contained in this thesis has not been submitted for a degree in any other university or educational institution. The thesis contains entirely my own work.

Signed:    

   

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ABSTRACT

THE FEASIBILITY, ACCEPTABILITY, AND POTENTIAL EFFICACY, OF AN AFTER-SCHOOL HOMEWORK CLUB, PHYSICAL ACTIVITY, AND SPORT PROGRAM FOR PRIMARY SCHOOL GIRLS: THE WOLLONGONG SPORT PROGRAM PROOF-OF-CONCEPT TRIAL.

By

Jessica Ryan

The prevalence of Australian primary school children being classified as overweight or obese is rapidly increasing. Numerous factors have been identified as the cause of this rising trend, with physical activity and sedentary behaviours regarded as key determinants. Traditionally many prevention and treatment programs have been implemented through the formal school curriculum however, another setting, which is yet to be thoroughly evaluated, is using school sites during the after-school time period, broadly encompassing 3pm to 5pm.

The purpose of this study was to assess the feasibility, acceptability, and potential efficacy of an after-school homework club, physical activity and sport program for primary school girls. Specifically the study investigated process evaluations including the recruitment, attendance, and retention of primary school girls, the collection of measurements, implementation data, and enjoyment of session information. The effect of the Wollongong Sport Program on participants BMI, BMI $z$ Score, Waist
Circumference, Perceived Level of Competence, and Quality of Life were also examined.

Thirteen girls aged 8 to 10 years from one Illawarra Primary School were recruited to the 9-week program, which focused on preventing unhealthy weight gain through the promotion of enjoyable and challenging physical activity sessions.

Process data were gathered at the beginning and throughout the entire program. At baseline and follow-up, the participants BMI, BMI z Score, Quality of Life, and Perceived Competence were collected.

The school executive, particularly the principal and stage two-coordinator identified the targeted number of girls who they believed would benefit most from being involved in the Wollongong Sport Program.

The physical activity and sport component of the program enabled all participants to have the opportunity to partake in various activities and games that were fun, challenging, individualised and allowed every participant to be successful. The program was conducted in an all female environment that promoted and encouraged positive social interaction among the participants and facilitators in union with providing all girls with encouraging and constructive feedback. This contributed to a 100% retention rate, a mean attendance rating of 93% and an overall mean participant enjoyment rating for each of the 15 intended sessions of 4.5 on a 5-point scale.
Dependent-sample *t*-tests were used to analyse the BMI, BMI *z* Score, Quality of Life and Perceived Competence data. Two analyses were completed: the first for the entire sample and the second on the eight participants who were overweight or obese. The sample size for this study did not provide adequate statistical power to detect statistical significant differences.

The results showed a stabilisation and small reduction in the girls BMI and BMI *z* Score for the entire sample and for those participants who were overweight or obese respectively. The Child and Parent Reported Quality of Life results for the entire sample and for the overweight or obese girls showed a small improvement in each of the four PedsQL dimensions, with a statistically significant result (*P*=0.03) in the parent reported physical functioning for the entire sample.

The perceived competence data showed a small increase in five of the six domains for the entire sample and for the overweight and obese girls, suggesting a trend towards improved perceived competence. Significant results were found in the physical appearance domain (*P*=0.048) for all participants, and in the scholastic competence (*P*=0.049) and physical appearance (*P*=0.04) domains for the overweight and obese participants.

This single proof-of-concept study has gathered data about the feasibility, acceptability, and potential efficacy of an after-school homework club, physical activity, and sport program. This will provide information for the creation and modelling of future after-school prevention and treatment programs for overweight and obese children.
The *Wollongong Sport Program* has demonstrated it is achievable to stabilise unhealthy weight gain, improve perceived competence and quality of life using a stealth intervention design for primary school girls who are and who are not overweight or obese.
DEDICATION

I am very proud to dedicate this thesis to the most important people in my life. Thank you to my family, Mum, Dad, Chris and Stuart and my partner, Ben for your continual love, support, guidance, motivation, humour and patience. Without you, completing this thesis would not have been achievable.

This thesis is also dedicated to Dr Tony Okely, whose enthusiasm, knowledge and dedication has motivated me to work to my full potential and has encouraged me to pursue my interests in health and education.
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Sanitarium and NSW Health for their financial assistance and support of the Wollongong Sport Program.

The Faculty of Education, the Alumni Association and ACHPER NSW for their financial support.
This thesis is entirely my own work; however, it did form part of a larger combined project, with two other Master of Education students. These research students also assessed the feasibility and acceptability of the *Wollongong Sport Program*, as well as the potential efficacy in relation to their focuses on cardiovascular fitness and physical activity levels.

The *Wollongong Sport Program* was designed and implemented by all three research students. Consequently, parts of the Methodology, Results and Discussion Chapters as well as the Appendices of this thesis, though my own work, are similar to those reported in the theses that also evaluated the *Wollongong Sport Program* and its effects.

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CHAPTER I: INTRODUCTION

1.1 BACKGROUND AND SIGNIFICANCE OF THE STUDY

Obesity has been declared an escalating global epidemic (World Health Organisation, 2004), with projections indicating that by the Year 2015, 2.3 billion adults will be classified as overweight, and 700 million will be obese (World Health Organisation, 2006). Similarly, trends show a substantial rise among Australian children with current evidence suggesting one quarter are either overweight or obese (Booth, Dobbins, Okely, Denney-Wilson & Hardy, 2007).

Childhood obesity has numerous short-term and long-term health consequences (Batch & Baur, 2005). In particular, it has implications upon the cardiovascular, pulmonary, gastrointestinal, renal, respiratory, and endocrine systems as well as causing orthopaedic complications (Thompson et al., 2007; Sa-Pinto, Barres-Holanda, Radu, Villares & Lima, 2006; Batch & Baur, 2005; Lobstein, Baur & Uauy, 2004; Baur, 2002 & Dietz, 1998).

However, the most frequent health consequences of obesity in childhood are psychosocial (Baur, 2002). With obese children commonly encountering stigmatization (Latner & Stunkard, 2003), as well as being targeted and teased (Storch et. al, 2006) by their peers due to their weight. Chia and Wang (2003) advocate this contributes to impaired psychosocial functioning with overweight children having poorer self-esteem and lower body dissatisfaction.
Furthermore, being overweight and obese in childhood and adolescence is strongly associated with obesity in adulthood (Gillison, Standage & Skevington, 2006). Girls for example, who are overweight as children, are 11 to 30 times more likely to be obese as adults (Thompson et al., 2007) and have a much higher BMI compared with someone who is an obese adult but was not obese as a child (Dietz & Robinson, 2005). This increases the risk of chronic health conditions and impacts upon their quality of life and life expectancy. As such, the prevention of unhealthy weight gain during childhood must be considered vitally important.

Numerous factors have been suggested as possible contributors to the increasing rate of childhood obesity. These include biological, genetic, environmental, social, behavioural, and lifestyle factors. The most commonly cited modifiable influences are participation in physical activity, time spent in sedentary behaviours, and dietary behaviours (Lobstein, Baur & Uauy, 2004). These three aspects are common intervention components designed to treat and prevent unhealthy weight gain in children.

A child’s participation in physical activity can prevent unhealthy weight gain (Moore et al., 2003). As such, ways need to be found to promote physical activity during childhood. When designing programs to promote physical activity, it is important to consider what motivates children. Drawing on well-known theories such as social cognitive theory and competence motivation theory, activities need to be fun, challenging, individualised and involve choice and fantasy (Robinson & Sirard, 2005). Consideration also needs to be given as to when interventions should be delivered. The after-school period is often promoted as it is the period when children
have the most discretionary time available and the school environment is often where most children spend the majority of their waking time.

There is increasing interest and popularity in after-school programs for overweight and obese children. It is suggested that if one behaviour is targeted in a program such as physical activity than this can indirectly impact upon others including small screen viewing and the consumption of unhealthy food due to the limited opportunity to participate in them (Robinson & Sirard, 2005).

In Australia, the most nationally recognised after-school physical activity sport program is the Active After-School Communities Program (Australian Sports Commission, 2006); which is available to all primary school aged children who are inactive and active. However, as yet no extensive evaluation or research into its effectiveness and impact upon participants both in the short and long-term have been completed.

Various after-school studies have been completed internationally and have shown promising results in relation to improved participation in physical activity and positive changes in anthropometry measures particularly BMI. However, a gap exists in an Australian context as to whether an after-school program specifically aimed at overweight and obese primary school aged girls is feasible, acceptable, and potentially efficacious.
Furthermore, the reported after-school interventions in the literature have infrequently examined the impact participating in physical activity programs have on participant’s quality of life and perceived competence.

Small-scale studies must be conducted prior to the implementation of a full-scale efficacy trial and this study evaluates the design and implementation of the Wollongong Sport Program. This proof-of-concept study is based on three central frameworks: Social Cognitive Theory, a Stealth Intervention, and a Mastery Orientated Environment and it is the aim of the Wollongong Sport Program to improve the participating girl’s perceived competence, quality of life, and anthropometry measures.

1.2 AIM OF THE STUDY

The aim of this study was to determine the feasibility, acceptability, and potential efficacy of an after-school homework club, physical activity and sport program for primary school girls.

The first aim was to ascertain whether the program was feasible. A number of goals were set to determine the feasibility of the program:

1. Can 12 primary school girls be recruited?
2. Could 90% of participants be retained pre-test to post-test?
3. Can all pre-test and post-test measurements be successfully collected?
The second aim was to determine whether the program was acceptable. Several goals were set to determine the program’s acceptability:

1. Can 100% of all intended sessions be implemented?
2. Can a minimum 80% attendance rate at each session be achieved?
3. That participants would rate their enjoyment of the sessions a minimum of three on a five-point scale.

The third aim was to consider whether the program demonstrated potentially efficacy. To establish this, three hypotheses were tested. These were that, as a result of participating in the Wollongong Sport Program, participants would demonstrate:

H1: A decrease or stability in BMI z Score (for those overweight or obese) or a stabilisation in BMI (the entire sample including those who were overweight or obese).

H2: An increase in Perceived Competence.

H3: An improvement in Quality of Life.

1.3 OVERVIEW OF METHODOLOGY

Data collected for this study were from 13 primary school girls, eight of whom were overweight or obese using a single group proof-of-concept study design.

The effect of the independent variable (the Wollongong Sport Program) on the dependent variables (BMI, BMI z Score, Waist Circumference, Perceived Competence and Quality of Life) in association with data from process evaluations
(facilitator reflections, attendance records and sessions evaluations) were used to
determine the feasibility, acceptability and potential efficacy of the *Wollongong Sport
Program*, an after-school homework club, physical activity and sport program for
primary school girls.

**1.4 LIMITATIONS**

This study assessed the feasibility, acceptability, and potential efficacy of an after-
school homework club, physical activity, and sport program for primary school girls.

The following factors may have limited the results of this study:

1. This study was a single proof-of-concept study accordingly, no control group
   was used. This limited the ability to control any history and maturation threats
to internal validity (Mertens, 2005). Therefore, the effects of the *Wollongong
Sport Program* on the participant’s perceived competence and quality of life
may not be solely due to the program alone.

2. The 13 participants involved were a convenience sample and since they
   volunteered to be involved in the after-school homework club, physical
   activity, and sport program, they may already possess greater behaviour
   change motivation and have a highly supportive and encouraging family
   network.

3. The sample size of 13 participants and particularly the number of participants
   (8 of 13) who were overweight or obese were not adequately powered to
detect statistical significant differences between baseline and follow up.

4. The time frame of nine weeks may not have been long enough to determine
   whether the *Wollongong Sport Program* could be feasible, acceptable, and
   potentially efficacious in the long-term.
5. There may have been a social desirability bias operating during the self-reported measures, this is because parents and participants may have felt that because of their involvement in the *Wollongong Sport Program* they should have improved in the targeted measures (Stevens, Taber, Murray and Ward, 2007).

6. The participants were required to answer the PedsQL Pediatric Quality of Life Inventory Child Report (Varni, 1998) (Appendix E) and Self-Perception Profile for Children (Harter, 1985) (Appendix H) questionnaires honestly.

7. Parents were required to answer the PedsQL Pediatric Quality of Life Inventory Parent Report (Varni, 1998) (Appendix F) truthfully.

1.5 DELIMITATIONS

This study was delimited in the following way:

1. The participant’s were female and aged between 8 and 10 years of age. They were a convenience sample, from one Illawarra government primary school.

2. Participants who were overweight or obese were classified using established International BMI cut-points (Cole, Bellizzi, Flegal & Dietz, 2000).

3. Quality of Life was measured using the parent and child versions of the PedsQL Pediatric Quality of Life Inventory Report, Version 4 (Varni, 1998). This measure was identified as a dependent variable.

4. Perceived Competence was measured using the Self-Perception Profile for Children (Harter, 1985). This measure was identified as a dependent variable.

5. This study was completed as part of an Honours Thesis at the University of Wollongong.
1.6 DEFINITION OF TERMS

Terms used in the context of this study are defined as follows:

**Physical Activity:** Bodily movements that are produced by contraction of the skeletal muscle and that substantially increase energy expenditure, which can be categorised in different ways (U.S. Department of Health and Human Services, 1996).

**Body Mass Index (BMI):** A measure of a person’s weight relative to their height. It can assess and indicate the extent of their weight: underweight, healthy weight, overweight and obese (Australian Institute of Health and Welfare, 2005). It is determined by weight in kilograms divided by height in metres squared (weight [kg] / height [m]$^2$).

**Overweight:** Internationally recognised cut points, adjusted for both age and gender, which link to having a body mass index equal to or greater than 25 kg/m$^2$ and less than or equal to 30kg/m$^2$ at 18 years of age (Cole, et al., 2000).

**Obese:** Internationally recognised cut points, adjusted for both age and gender, which link to having a body mass index equal to or greater than 30kg/ m$^2$ at 18 years of age (Cole, et al., 2000).

**BMI z Score:** is a measure of relative weight that is adjusted for a child’s age, gender, and growth which corresponds to growth chart percentiles. In order to calculate a child’s BMI z Score their age, gender, BMI and an appropriate reference standard is
required. It is based upon an external reference (national or international) not an internal reference (Must & Anderson, 2006).

**After-School Program:** A program designed for children that occurs immediately following the end of the school day until approximately 5pm.

**Primary School:** An education setting in New South Wales, which caters for the educational needs of children, aged 5 to 12 years of age from Kindergarten to Year 6. During these school years, the focus is on numeracy and literacy (NSW Department of Education and Training, 2007.)

**Health-Related Quality of Life:** Is recognised as an important health outcome measure in clinical trials and health service research and evaluation. It is multidimensional and considers a person’s physical, psychological, and social dimensions of health (Varni, Limbers & Burwinkle, 2007).

**Perceived Competence:** Refers to the whole complex of beliefs about ones own competencies (University of Groningen, 1992). Includes scholastic, social, athletic, physical and behavioural (Harter, 1985).

**Self-Esteem:** Refers to an individual’s feelings of his or her worthiness and competence (Muris, Meesters & Fijen, 2003). Related terms include self-love, self-confidence, self-acceptance (or rejection), self-satisfaction, self-evaluation, self-appraisal, self-worth, sense of adequacy, personal efficacy and a sense of competence (Hayes and Fors, 1990).
CHAPTER II: REVIEW OF THE LITERATURE

2.1 HEALTH CONSEQUENCES OF CHILDHOOD OVERWEIGHT AND OBESITY

The World Health Organisation (2004) describes obesity as an escalating global epidemic. Current worldwide trends reinforce this description; the global projection for 2005 was that 1.6 billion adults would be overweight, 400 million obese, and 20 million children under the age of five would be overweight. These statistics are projected to substantially increase, so that by the Year 2015, 2.3 billion adults will be classified as overweight and 700 million obese (World Health Organisation, 2006). These same statistics have not been reported for children.

Consistent with this increasing trend in adults has been the considerable rise in the proportion of Australian children and adolescents who are overweight and obese. The current evidence suggests a prevalence of approximately 25% of children are overweight or obese (Booth et al., 2007).

Overweight and obesity has numerous short-term and long-term health consequences (Batch & Baur, 2005) and has serious health implications for children. Batch and Baur (2005) proposed many medical and psychological complications can occur in children and adolescents who are overweight or obese and these concerns can lead to long-term health problems in adulthood.
Cardiovascular concerns are more common in overweight and obese children. These can include increased blood pressure, serum total cholesterol, low-density lipoprotein cholesterol, triglycerides and fasting insulin levels as well as a reduction in high-density lipoprotein cholesterol (Thompson et al., 2007). For example, obese children have a nine times greater chance of hypertension (elevated blood pressure) than non-obese children (Dietz, 1998). These are all considered risk factors for cardiovascular disease.

Pulmonary complications are also common in overweight and obese children, particularly obstructive sleep apnoea (a breathing disorder characterised by interruptions of breathing during sleep) (Council on Sports Medicine and Fitness, 2006), exercise intolerance and asthma (Batch & Baur, 2005).

Batch and Baur (2005) also maintain obese children have a greater likelihood of gastrointestinal and renal complications including gallstones (solid masses made of cholesterol that form in the gall bladder), gastro-oesophageal reflux (the gastric content of the stomach returns to the oesophagus), non-alcoholic fatty liver disorder (fatty inflammation of the liver that is associated with insulin resistance and not excessive alcohol consumption) and glomerulosclerosis (scarring of the blood vessels in the kidneys) due to their excess body weight.

Obese and overweight children also present with a higher frequency of lower limb and lower back pain than non-overweight children (Baur, 2002). Sa-Pinto, Barres-Holanda, Radu, Villares and Lima (2006) stated that increases in the weight bearing forces caused by obesity are detrimental to the lower limbs and feet of children. This
is evident in permanent bone deformities including Blount disease and slipped capital femoral epiphysis as well as postural changes such as lumbar hyper-lordosis, genu valgum (knock-knees) and genu recurvatum.

The endocrine system of an obese child can also be affected. Examples of the health implications on this body system include precocious puberty (early onset of puberty); glucose intolerance and insulin resistance which if untreated can progress to Type 2 diabetes (Batch & Baur, 2005). Additionally Batch and Baur (2005) suggest that overweight female adolescents may experience menstrual irregularities and/or polycystic ovary syndrome, where ovary cysts affect normal ovulation and menstruation.

In addition, a girl’s weight is believed to impact upon menarchal timing, with overweight and obese girls experiencing their first period earlier than non-overweight girls (Lobstein, Baur & Uauy, 2004). This early menarche is a suggested risk factor for breast cancer and other reproductive cancers in adulthood (Marshall et al., 1998; McPherson et al., 1996 cited in Lobstein, Baur & Uauy, 2004).

Baur (2002) proposed the most common health consequence of childhood and adolescence obesity is one of a psychosocial concern. Penny and Haddock (2006) for example recommend that an obesity stigma exists and this has serious implications for obese individuals. They state that overweight adults are perceived in the community as being less popular, attractive, intelligent, and less successful in relationships and employment.
This stigmatization of the obese has also been found among children. Cramer and Steinwert (1998) reported that many children aged three to five years identify overweight peers as being mean and unwanted playmates. This notion is supported by Kraig and Keel (2005) who found that children aged 7 to 10 rated overweight classmates as the least liked. Furthermore, Hill and Silver (1995) state children use greater negative descriptors such as ‘lazy’ and ‘stupid’ for obese children than children of any other build. These findings were supported by the research of Latner and Stunkard (2003) who examined whether obese stigmatization by 10 to 11 year old children had changed between the years, 1961 and 2001. The results showed that in 2001, children were more biased against peers who are overweight or obese and showed a greater liking of healthy peers than in 1961.

With specific reference to girls, overweight girls are considerably less likely to be viewed as being pretty by their average weighted peers (Phillips & Hill, 1998). The stereotype of overweight as not being attractive is well entrenched by the age of nine among girls (Hills & Silver, 1995).

This evidence suggests children are less likely to be friends with an overweight or obese peer. Subsequently overweight children are often victimised and teased due to their weight (Storch et. al, 2006). This contributes to an impaired psychosocial functioning with overweight children often having poorer self-esteem and lower body dissatisfaction (Chia & Wang, 2003; O’Conner, 2001). For example, the quality of life of an overweight child declines as soon as a child’s weight increases above the average weight for their age group and alarmingly, severely obese children report a
quality of life similar to that of a child diagnosed with cancer (Williams, Wake, Hesketh, Maher & Waters, 2005).

Being overweight and obese in childhood and adolescence is strongly linked with obesity in adulthood (Gillison, Standage & Skevington, 2006). Baur (2002) proposes this should be considered a significant long-term health consequence of childhood obesity. This is because overweight that begins in children before the age of eight and continues into adulthood is associated with an average BMI of 41 in adulthood compared to a BMI of 35 for adult onset obesity (Dietz & Robinson, 2005).

A study conducted by Whitaker, Wright, Pepe and Dietz (1997) aimed to determine the probability of obesity in young adulthood in relation to the presence or non-existence of obesity at various stages of a child’s life. The results indicated that the likelihood of being obese as an adult increased with the obese child’s age. After six years of age, the probability of obesity in adulthood was greater than 50% for obese children compared with 10% for children of a healthy weight.

Of particular importance to this study is the tracking or persistence of overweight and obesity among girls. Thompson et al (2007) suggest, that overweight girls are 11 to 30 times more likely to remain this way into adulthood.

In 2005, the financial cost to Australia associated with overweight and obesity was estimated at $21 billion dollars (Access Economics, 2006). This vast expenditure was distributed across many societal aspects including health care, productivity, carer
costs, and welfare and government payments. This highlighted that obesity has implications on most facets of life.

The health and economic consequences of childhood obesity are substantial, and one can expect this to rise due to the associated trend between childhood and adult obesity. Hence, the urgent need for the implementation of preventative measures with a special concern focused on those children and adolescents who are overweight or obese.

2.2 PREVALENCE AND TREND OF OVERWEIGHT AND OBESITY IN AUSTRALIAN CHILDREN

In Australia, the prevalence of childhood obesity has been more regularly reported in recent years. It is vital that information on the prevalence and trend of childhood obesity is gained, collected, and reported upon so that an accurate determination of the problem can be established; this can then affect decisions regarding public health and allocation of resources (Booth et.al, 2001).

Magarey, Daniels, John and Boulton (2001) analysed data from two Australian samples of school-aged children from 1985 and 1995. The results showed that approximately 20% of girls and boys aged between 2 and 18 years of age were overweight or obese. A peak in prevalence occurred in girls during the ages of 7 to 11 years where as in boys this peak occurred later, between the ages of 12 to 15.
The New South Wales Schools Physical Activity and Nutrition Survey (SPANS) conducted in 2004 offers some of the most representative data on the current prevalence of overweight and obesity amongst Australian school children and adolescents in NSW. SPANS was a representative population study of school students with approximately 900 students assessed in each of the following school years: Kindergarten, Year 2, 4, 6, 8 and 10 (Booth et al., 2006).

The results of the SPANS study revealed similar trends in the prevalence of both girls and boys during their schooling. In girls, 21% of Kindergarten students were overweight or obese; this increased to 30% in Year 4 and decreased to 19% in Year 10. In boys, the prevalence was 15% in Kindergarten, increasing to 32% in Year 6 and decreasing to 27% in secondary students. In summary, the prevalence among female and male students was similar, 76% of students were in the healthy weight range, 17% were overweight and 7% were obese (Booth et al., 2007).

Interestingly the prevalence of obesity and overweight combined was greater among girls than boys in Kindergarten, Year 2 and Year 4 but in Year 6, Year 8 and Year 10 the prevalence of obesity and overweight combined was greater in boys (Booth et. al, 2007).

SPANS also provided an insight into the impact rurality, socio economic status and cultural background has on the prevalence of overweight and obesity on Australian students.
The geographic location (rural or urban) of a female child or adolescent had little impact on the prevalence rate of overweight or obesity (Booth, et. al, 2006). Booth et. al, (2004) suggested an inverse relationship existed between socio economic status and the prevalence of childhood overweight and obesity. A higher socio economic status equated to a decreased prevalence of overweight and obesity in children. This was supported by the results from a Victorian study that found the chance of a child being overweight or obese was significantly greater in households with a lower socio economic status and if the child's father had a lower educational level (Sanigorski, Bell, Kremer & Swinburn, 2007).

The impact of cultural background upon the prevalence of obesity was also reported in the SPANS study. In girls, cultural heritage and the prevalence of overweight and obesity varied across the school years, with the exception of girls from a middle-eastern cultural background, who in Year 6 and 10 had a significantly higher prevalence of unhealthy weight status (Booth et. al, 2006).

Sanigorski, Bell, Kremer and Swinburn (2007) proposed that the trajectory rise of Australian children becoming overweight or obese is approximately one percentage point per year, which equates to 40 000 children becoming overweight and obese. The trend of overweight and obesity amongst Australian children and adolescents highlights an increasing prevalence rate that should be of great concern.
2.3 FACTORS THAT INFLUENCE UNHEALTHY WEIGHT GAIN
IN CHILDREN

With the increasing trend in the prevalence of overweight and obesity in children, it is crucial to understand the influence of non-modifiable and modifiable factors on the global obesity epidemic.

Non-modifiable factors; include biological influences including age, gender and genetics (Egger and Swinburn, 1997).

A 'spike' in the prevalence of childhood overweight and obesity generally occurs around the time of puberty. Dietz and Gortmaker (2001) suggested three life-periods: the prenatal period, the period of adiposity rebound (the point at which BMI increases after its lowest point in childhood) and adolescence as crucial periods for the development of childhood obesity that continued into adulthood.

Contention exists within the literature and the medical world about whether a specific 'obesity gene' is present or whether this is just a fallacy. Tiwari and Allison (2003) reported on the gene solute carrier family 6 member 14 (SLC6A14) which is proposed as being a likely susceptibility gene for obesity. This is attributed to its involvement in brain chemistry, particularly appetite control. Despite this, no single identified gene is currently known to cause obesity in humans (Schonfeld-Warden & Warden, 2001).

Farooqi and O'Rahilly (2007) suggest the rate at which the obesity epidemic has transpired has established a mistaken belief that hereditary factors have an
insignificant role in unhealthy weight gain. However a study conducted by Mares, Neale and Eaves in 1997 (cited in Sorensen & Echwald, 2001) involving monozygotic (identical) and dizygotic (non-identical) twins showed a greater similarity in the degree of obesity between genetically identical twins. This suggests that obesity is related to like genes rather than exclusively the environment. In addition, Lobstein, Baur and Uauy (2004) claim an individual’s probability of being overweight or obese are increased if they have an overweight or obese family relative. In statistical terms, hereditary factors have been approximated as having a 45 to 75% responsibility in the variation of an individual’s BMI (Farooqi & O’Rahilly, 2007).

As such, it is imperative biological and modifiable factors are both recognised as having an influence on unhealthy weight gain in children, rather than just presuming every individual has a genetically predetermined body weight and little can be done to modify it.

In 1 – 2% of obese children, their obesity is a direct consequence of being diagnosed with one of the 30 identified disorders in which obesity is a clinical feature; examples include Down Syndrome, Prader-Willi Syndrome and Albright Hereditary Osteodystrophy (Lobstein, Baur & Uauy, 2004). In addition, for a small number of children existing medical conditions may require medication that results in the child gaining weight (Council on Sports Medicine and Fitness and Council on School Health, 2006).

O’Conner (2001) contends adults have had an influential role in the development of obesity and body image in children. This is attributable to parents having a great
influence upon their child's dietary practices, physical activity involvement, and level of sedentary behaviours through the modelling of their own behaviours as well as their own attitudes towards each of these factors (Lindsay, Sussner, Kim & Gortmaker, 2006). Therefore, parents who model healthy behaviours and attitudes are more likely to positively impact upon their child's weight and body image.

The weight status of parents can also increase the likelihood of their child being obese in young adulthood. Whitaker et al., (1997) reported that the odds ratio for a child aged six to nine years being obese in adulthood is 2.6 times greater if one parent is obese compared to a child without an obese parent and this rate increased to being five times greater if both parents are obese.

Mota et al. (2005) identified social, environmental, and behavioural factors as being the key modifiable influences on children and their unhealthy weight gain. It is important that these factors are not considered in isolation. Sorensen and Echwald (2001) emphasise that obesity is the result of interactions between genetic predispositions and environmental influences, not just one, or the other. The most commonly cited examples of modifiable influences on children's adiposity include physical activity participation; time spent partaking in sedentary behaviours and dietary habits. These three influences should not be viewed as being independent from each other instead they must be regarded as interconnected.

Unhealthy weight gain is commonly deemed to be the result of an energy imbalance, whereby there is greater energy consumption in comparison to energy expenditure.
Consequently, physical activity is proposed as being an important causal factor in the development or continuation of childhood obesity (Trost, Kerr, Ward & Pate, 2001). Despite this knowledge, Moore et al (2003) stated it has been challenging to establish the true extent to which physical activity has on the development of adiposity during childhood. Examinations of cross-sectional studies, longitudinal studies, and interventions have aimed to establish the association between physical activity participation and adiposity so as to provide a greater knowledge of this relationship.

Ekelund et al. (2004) conducted a cross-sectional study involving 1292 children who were aged between 9 to 10 years in four regions of Europe to determine associations between objectively measured physical activity participation and body adiposity. The results showed that children who were within their healthy weight range were involved in significantly \((P=0.022)\) greater amounts of moderate to vigorous physical activity than children who were obese. Additionally a significant inverse correlation existed between time spent participating in physical activity and the sum of five skinfold thicknesses as well as a positive correlation between the time spent involved in sedentary behaviours and the sum of skinfold thicknesses. It was deduced that children who were involved in more than two hours of moderate to vigorous physical activity per day had significantly \((P=0.006)\) lower skin fold thickness measurements than those children who spent less than one hour per day involved in activity at this intensity.

Similar findings were shown by Trost, Kerr, Ward and Pate (2001) who conducted a study involving ethnically diverse children who had an average age of 11.4 years. Results revealed that, compared to non obese children, obese children had
significantly lower counts of daily physical activity \((P=0.003)\), daily participation in moderate physical activity \((P=0.002)\) and daily participation in vigorous physical activity \((P=0.001)\). Additionally obese children participated in significantly less five minute \((P=0.001)\), 10 minute \((P=0.002)\) and 20 minute \((P=0.009)\) sessions of moderate physical activity per week in contrast to children that were not overweight.

Longitudinal studies also provide information on the connection/s between participation in physical activity and adiposity in children. The Framingham Children’s Study (Moore et al., 2003) assessed the impact of physical activity on childhood obesity over an eight-year period involving 103 children.

Children’s participation in physical activity in this study was assessed using an accelerometer, for three to five consecutive days biannually. When analysing the longitudinal data, each participant was assigned an activity tertile of low, moderate or high based upon their mean activity level over the entire eight years as well as for each individual year. The results showed that at baseline the children who were most active had a slightly higher BMI and the least active participants had greater levels of subcutaneous fat, however there was no reliable difference between adiposity and its relationship to physical activity participation. Eight years later (post-intervention) the results showed a trend that the children in the highest activity tertile had significantly lower mean BMI \((P=0.052)\) and a lower total sum of skinfolds \((P=0.045)\) compared with children in the moderate and low activity groups.

Analyses of the entire study period showed that at each age, the children who were most active had the smallest increases in their BMI and these children reached their
nadir of body fat (adiposity rebound) at approximately six years of age. This was later in life than the children who were in the moderate and low physical activity tertiles. This has been suggested as a possible factor in reducing the risk of obesity in adulthood (Dietz & Gortmaker, 2001).

Comparison between genders demonstrated that girls in the moderate and low physical activity groups had greater increases in adiposity starting at age five, than boys. This was an important finding, suggesting that high levels of physical activity can be an effective protective factor against unhealthy weight gain; however, no specification on the amount of physical activity needed was found or proposed.

The objective of the longitudinal intervention, the Muscatine Study (Janz, Dawson & Mahoney, 2000) was to increase knowledge about when children form long-term exercise and fitness patterns.

This five-year study involved 126 participants from Muscatine, Iowa who had a mean age of 10.4 years. On an annual basis, data were collected on sexual maturation and physical fitness of the participant's while quarterly anthropometry, bioelectrical impedance and physical activity measurements were recorded. The five-year follow-up results showed that for both genders increases in body weight occurred over the length of the study; this was expected given the growth phase between childhood and adolescence.

The results showed that male participants had improved levels of vigorous activity as they moved from childhood to adolescence but in girls, the amount remained the
same. This indicated that boys are more likely to establish physical activity and fitness patterns sooner than girls, an important finding in relation to physical activity and its connection to adiposity as discussed in the aforementioned studies.

Epstein and Goldfield (1999) reviewed 13 interventions to examine the effectiveness of using physical activity as a treatment for children who were overweight and obese. The interventions all utilized different experimental designs and the participants in these studies were of varying ages ranging from children to adolescents.

Their analyses of the interventions revealed that treatment groups assigned to participate in physical activity had significantly greater reductions in adiposity when compared to controls. Other interventions were examined in relation to the effect/s of differing program designs, those that were lifestyle activity based and those more traditional such as aerobic exercise and callisthenics. The results showed that at 6 and 12-month assessments all groups in both program designs showed similar reductions in the percentage of participants that were overweight. However, after two years the lifestyle activity design had continued to reduce its percentage of overweight individuals whereas the aerobic and callisthenic design had increases in the percentage of participants who were overweight. This result provides some clues as to what forms of physical activity may sustain weight reduction.

The results gained from these studies reveal a lack of participation in physical activity can be associated with unhealthy weight during the childhood years. No definitive conclusion has been reached about what constitutes the 'ideal' amount of time and the
form of physical activity needed to prevent unhealthy weight and adiposity in children.

Another proposed factor influencing unhealthy weight gain in children is time spent in sedentary behaviours, particularly small screen viewing (computer and video game use but particularly television viewing). Numerous studies have sought to examine the correlation between television viewing and overweight and obesity in children. Robinson et al. (2003) hypothesised three probable associations between television viewing and childhood obesity. The first is that watching television decreases energy expenditure due to non participation in physical activity, secondly there can be increased dietary intake due to snacking whilst viewing as well as the impact of commercial food advertising and thirdly a child’s resting metabolic rate is reduced during television viewing.

An investigation conducted by Davison, Marshall and Birch (2006) aimed to determine whether any cross-sectional and / or longitudinal relations existed between television viewing and a girls BMI, weight status and percentage body fat.

The 192 female participants were from Pennsylvania and were from varying socio economic status. Data were collected on participants when they were seven (baseline), nine and eleven years (follow up) of age and included their weight, height, pubertal development and their television viewing habits.

The results showed that the percentage of girls who had a BMI greater than or equal to the 85th percentile increased from 18.9% at age seven to 28.9% at age eleven. This
increasing trend was also shown to correlate with the mean number of hours of television viewed per day, which similarly rose from 1.73 hours to 1.91 hours.

Girls who watched greater than the America Academy of Pediatrics TV Viewing Recommendations (two hours per day) at all ages had a significantly greater BMI ($P<0.05$) and higher percentage body fat ($P<0.05$) at age eleven. Additionally girls who watched television for more than two hours had a greater BMI across the age span from seven to eleven years ($P<0.01$) than girls who watched less than two hours. Consequently, it was deduced that girls who watched television for more than the recommended two hours at all ages were 4.7 times more likely to be overweight or obese during age’s seven to eleven than girls who did not. No cross-sectional differences were found.

A longitudinal study conducted by Hancox and Poulton (2006) in Dunedin, New Zealand aimed to determine the association between television viewing in childhood and adolescence on BMI. The participants' weeknight television viewing was assessed at birth and every two years thereafter from three years of age until the participants were 15. The study at baseline involved 1037 participants and had a 95% retention rate at follow up.

The results showed that at each age the mean number of television hours watched had a significant relationship with BMI. The use of prospective correlations revealed that at each age there was an association with the average reported television hours viewed before that age, significant results across all ages were seen with the exception at age
11. In addition, a stronger association between BMI and the number of television hours watched was shown in girls than boys.

Similar results were gained from the Framingham Children's Study (Proctor et al., 2003). This longitudinal study aimed to examine the extent of the relationship between television viewing and adiposity during childhood. At baseline, the results from the 106 participants showed no associations between age or anthropometry levels with television viewing practices. There were indications however that the children who watched the greatest amount of television had parents with higher BMI's.

At the end of follow up (eight years after baseline), the results revealed that by early adolescence, age 11, BMI and the sum of five skinfold measurements were greatest in those children who had watched the most television during childhood. Children who watched greater than three hours per day had a BMI of 20.9 and a skinfold sum of 106.2mm compared with participants who watched less than 1.75 hours per day and who had a BMI of 18.6 and skinfold sum of 76.5mm.

Concern arises if one considers and transfers the results of the Framingham Children's study to the average number of hours Australian children are watching television. Hardy, Dobbins, Denney-Wilson, Okely and Booth (2006) reported on the results from the 2004 NSW School Physical Activity and Nutrition Survey that showed only 38% of primary and secondary students viewed less than 2 hours of television per day, 40% watched between 2 and 3.9 hours per day, 17% of students viewed 4 to 5.9 hours and 6% watched greater than 6 hours of television per day. One may infer that those
Australian children who are watching many hours of television per day are likely to gain unhealthy amounts of weight.

Intervention studies also provide information about the connection/s between television viewing and adiposity in children. Gortmaker et al. (1999) for example conducted a school-based multi dimensional intervention over a two-year period entitled Planet Health. The objective was to reduce obesity in children in grades six and eight through the modification of risk factors, including television viewing.

Results showed that the number of television hours per day watched was reduced in the intervention group, the girls television viewing significantly reduced ($P=0.001$), similarly a decrease occurred in the boys ($P<0.001$) viewing when compared with students in the control schools. Analyses revealed that for each hour of reduced television viewing there was an independent association with a reduction of obesity prevalence ($P=0.02$). This highlights the importance and health benefits that children can gain by reducing the time involved in small screen viewing.

Furthermore Robinson et al. (2003) conducted the Stanford GEMS Pilot Study, an after-school intervention for African American girls aged between 8 to 10 years of age that aimed to increase physical activity through dance and reduce television viewing to prevent unhealthy weight gain. Television viewing was targeted using a five-lesson approach, with the lessons being facilitated at each participant’s home.

The results showed that the treatment group, had a reported weekly reduction of 23% media use in comparison to the control group and a statistical significant decrease
was shown in total household television use in the treatment group. While not solely attributable to the reduced small screen viewing, the treatment groups’ BMI and waist circumference increased by only half that of the control and positive trends in physical activity participation were seen. This demonstrated the importance of intervention programs for overweight and obese children being multi-faceted in nature and that incorporate an element on reducing television viewing.

The results from the interventions and programs discussed indicate that a child’s involvement in sedentary behaviours and a lack of participation in physical activity can be associated with unhealthy weight gain and adiposity.

Acknowledgement must also be given to the role diet and nutrition has on unhealthy weight gain in children. Intervention studies such as the Hunter Illawarra Kids Challenge Using Parent Support (HIKCUPS) program, which included dietary modifications, showed that a child’s diet can be modified to prevent unhealthy weight gain in overweight and obese participants (Okely et al., 2007). However, these aspects are not the focus of this study.

Focusing on modifiable behaviours including physical activity, small screen viewing, and diet as a means of preventing and treating overweight and obesity in children is appropriate. The challenge is to design interventions that are not too complex and demanding, so participants and families are not overwhelmed. One suggested method is a stealth intervention, which is a central framework for this study.
2.4 DESIGNING PROGRAMS TO PREVENT AND TREAT CHILDHOOD OBESITY

Programs and interventions to prevent and treat overweight and obesity in children have been designed and implemented in various ways and in different settings. Historically the most common form of prevention intervention has been those based within the school setting (Cale & Harris, 2006). Biddle, Sallis and Cavil (1998 cited in Mota, 2005) attribute this to the large proportion of time students spend at school and because schools provide a captive audience and the opportunity for preventative interventions to occur.

Story (1999) categorised school-based programs as being either primary or secondary interventions. Primary interventions are those that focus on preventative strategies and involve all students, whereas secondary are those that concentrate on overweight or obese students and aim to treat the problem. Whichever form is implemented it is critical that consideration is given to the possible victimisation and stigma a child who is overweight or obese may encounter from peers (Storch et al., 2006).

Gillison, Standage, and Skevington (2006) stated that school-based interventions seldom show continued improvement in physical activity rates beyond the program. Many reasons could account for this lack of success including the exclusion of psychosocial mediators in programs (Gillison, Standage & Skevington, 2006), schools and its teachers are already responsible for an overcrowded curriculum, ownership, and motivation of the program post intervention must become the responsibility of others.
Despite this, two school-based obesity prevention interventions have been successful. Planet Health (Gortmaker et al., 1999) for example was designed to reduce obesity in students in grade six to grade eight. This was achieved through four key behaviour changes: the reduction of television viewing to less than two hours per day, increasing participation in moderate to vigorous activity, a decreased consumption of high fat foods and an increased consumption of fruit and vegetables. The intervention occurred in five schools in Boston, with five schools in the same community acting as controls throughout the two-year study period.

The Planet Health program was unique in design. An interdisciplinary curriculum approach was used, which saw the program material being taught to students by teachers from within their own school in various key learning areas including physical education, mathematics, science, and social studies. This implementation procedure was beneficial, in that it reduced the programs costs by not having to hire and renumerate facilitators, teachers throughout the school were involved and this enabled the program to be reinforced and supported school wide, and, teachers experiences, expertise and opinions were valued and included in designing the programs units. In comparison, the control schools continued with their usual curriculum and included no aspect of the Planet Health intervention.

The results of the Planet Health Intervention were positive. The primary outcome was obesity; with the results revealing that the prevalence of obesity in the intervention schools was significantly reduced in females students ($P=0.03$) compared with females in the control schools. Likewise, a decline occurred in the boys however, there was no statistical significant difference. Positive behaviour changes were also
shown between the intervention and control schools. Reductions in television viewing for both girls and boys occurred in the intervention schools with each reduced hour of television viewing independently associated with a reduction in obesity prevalence. Additionally, increases in estimated energy expenditure per day and an increased fruit and vegetable consumption from baseline to follow-up in girls occurred in the schools that had implemented the Planet Health program.

Robinson (1999) conducted a randomized control school-based intervention that had the objective of assessing the effects of reducing television, videotape, and video game use on changes in children’s adiposity, physical activity participation, and dietary intake. Two elementary schools were selected in San Jose, California and matched in relation to scholastic, socio-economic, and demographic characteristics. One school became the intervention group, the other acted as a control. This study design enabled the results of both groups to be compared against one another because of their likeness, to determine the true effect of the intervention. The children involved were students in grades three and four and had a mean age of 8.9 years.

The children in the intervention group received 18 lessons that were incorporated into their curriculum at the beginning of the school year. The lessons were facilitated by their classroom teacher and totalled 18 hours of allocated classroom time. In addition, newsletters were distributed to parents to act as a motivator and reinforcement of what was being learnt and encouraged at school. This intervention element suggests the importance of school-based interventions including and encouraging parental involvement, so that connections and behaviour modifications can occur between
school and home. The control group participated only in the pre and post-intervention data collection assessments.

The results of the intervention showed that at baseline both the intervention and control groups were comparable ($P>0.10$) on all body composition measures. The children were expected to show increases in their anthropometry measures due to their age. At follow-up, the intervention group showed statistically significant relative reductions in their BMI ($P=0.002$), triceps measurements ($P=0.002$) and waist circumference ($P<0.001$) compared with children in the control. In addition the intervention group results at post-test revealed a significant reduction ($P<0.001$) in television hours watched per week reported by both child and parent and positive trends were shown in reduced consumption of high fat foods and improved physical activity levels when compared with the control group.

These school based programs (Gortmaker et al., 1999; Robinson, 1999) demonstrate that interventions designed to target obesity and its associated behaviours are possible and can be successful in a school setting, however they do require considerable involvement and support of school staff. The provision of resources to schools and its teachers and the intervention’s ability to link to the school curriculum indicates such programs can be created and could be generalised for use in many schools. This may create intervention sustainability over the longer term. This is particularly importantly given Boon and Clydesdale’s (2005) suggestion that interventions need to be long-term for continued body composition improvements.
A school intervention with the objective of increasing physical activity and or reducing weight could possibly have a detrimental affect upon those students who are overweight or obese. If these students are highlighted as having a weight problem to peers this can negatively impact upon their self-esteem (Chia & Wang, 2003) which consequently may decrease motivation for continued physical activity participation. Furthermore school-based physical activity interventions that are available for all students, may favour students who are athletic, lean and skilled due to their sporting dominance and confidence, which can be attributed to these students having had successful and enjoyable physical activity experiences, often unlike their peers who are overweight or obese.

The uncertainty surrounding the long-term effectiveness of school-based interventions for overweight and obese children has led many to recommend ‘better practice’. Story (1999) for example believes school-based programs must have a comprehensive school health approach rather than solely focusing on individual behaviours such as physical activity.

The comprehensive health model by Allensworth and Kolbe (1987) is one probable method that schools could consider when designing programs to prevent obesity in children. The model encompasses a whole school approach around eight key areas: health curriculum, physical education classes, school counselling and psychology programs, school-site health promotion for school staff, family and community links, school nutrition, school health services and school food service. In emphasising the importance of a holistic perspective, O’Conner (2001) agrees and advocates school-based interventions need a broad preventative methodology that encompasses and
focuses upon protective aspects including self-esteem, self-care and the creation of a sense of belonging.

With the uncertainty surrounding the effectiveness of school-based interventions to alter physical activity behaviours in overweight and obese children (Cale & Harris, 2006) different options have been suggested, tried and evaluated in recent years including those conducted in community settings and during the after-school time period.

Cale and Harris (2006) suggest that the variety of community based programs that are in existence and which are designed to prevent and or treat childhood obesity, are likely to be the result of the increasingly important role communities have in dealing with the obesity epidemic.

Common forms of community-based program are group camps (Gately, Cooke, Butterly, Mackreth & Carroll, 2000). One example is the Project Destiny Program (Kyles & Lounsbery, 2004). This intervention aimed to have its participants, all non-athletic pre-teen girls involved in physical activity that was fun, interesting, and challenging. The researchers reasoned that an all girl group would enable the participants to be themselves, which would improve their self-esteem through the avoidance of pressures that exist within a co-educational physical activity context. Consideration was given to group dynamics and a small group of 15 participants (ranging in age from 11 to 14 years) was considered to be more productive in creating and maintaining a team-like environment.
The Project Destiny program was piloted for five weeks in Los Angeles during the summer holidays. The girls met three times per week from 9:30am to 4:30pm, in a local park. The program had various curriculum elements including athletic activities, workshops on health and wellness, art projects, leadership, cooperative games and invited guest speakers. Each week a new topic was introduced it involved a related excursion to a community organisation. The physical activity component focused on teaching fundamental movement skills due to the participants not having previously participated in organised sport.

The results of the program were encouraging, with the participants describing the program as “fun” and indicating they had a greater interest in sport and would attend the program the following year. The researcher’s decision to have all female participants was extremely well supported by the girls, who claimed it made the program more beneficial to them, thus demonstrating the feasibility of designing and conducting programs that specifically cater for inactive girls.

Consideration of same sex gender groups is important for interventions designed to treat childhood obesity. Kyles and Lounsbery (2004) argue that an assumption exists where girls are either categorised as being athletic and who participate in sport and physical activity or girls are non athletic and simply do not participate. Therefore, this emphasises the need for programs to be tailored and designed just for girls.

Of increasing popularity and interest are programs that are conducted during the after-school period. This is the time that immediately follows the end of the school day until approximately 5pm. During the after-school, period many children are involved
in sedentary behaviours rather than being engaged in physically activity (Naughton et al., 2005). The reasons for this are varied and can include the costs involved in after-school activities, the lack of space for children to play games and the increasing numbers of parents who work. Yin et al. (2005) for example selected the after-school time period for the Medical College of Georgia (MCG) FitKid Project as this time period was perceived as being the easiest and would have the greatest impact on a child's participation in physical activity and subsequently reduce the availability of unhealthy snacks.

Programs designed for overweight and obese children differ between those conducted during school hours and those conducted during the after-school period. Boon and Clydesdale (2005) summarised the distinction into two areas. The first being that programs during the after-school period usually involve all participants who are overweight in contrast to school-based program where a combination of children who are and who are not overweight are involved. Secondly, the children and / or their families involved in an after-school intervention are more likely to have a greater concern about the child's unhealthy weight gain because of their motivation to allocate time to participate.

The CATCH Kids Club (an adaptation of the Coordinated Approach to Child Health program, which was designed for the early prevention of cardiovascular disease) is one example of a piloted after-school-based physical activity and nutrition program (Kelder et al., 2004). The quasi-experimental pilot design had 16 after-school sites in Texas with participants having a mean age of nine years. A 61% participant retention
rate was achieved which equated to 157 participants completing both baseline and follow up measurements.

The CATCH Kids Club consisted of three central components. The first was a five-module education component which included aspects such as modelling, goal setting and healthy eating information. The second was a physical activity element that aimed to increase the participants’ participation in daily physical activity particularly moderate to vigorous as well as providing enjoyable opportunities for the participants to practice their new skills. And, the final aspect was a snack component which aimed to introduce participants to healthy food, its selection and its preparation. Eight sites received all three components; the other eight sites received only the physical activity component.

The results of the CATCH Kids Club were promising and demonstrated a trend in the right direction. The most significant result for the sites that received all 3 components was an increase in the percentage of time participants were engaged in playground moderate to vigorous physical activity; rising from 29.46% to 56.84% at follow-up. This trend was not evident at all sites; instead, a reduction was only shown at the sites that received the physical activity component.

Additionally the results from the eight sites that included the education component showed positive trends, most notably improvements in food knowledge and a marginally significant result in increased vegetable intake and consumption of fruit for lunch. This indicated a multi-faceted program does have positive benefits on participant’s participation in physical activity and their nutrition.
Focus groups recommended implementation changes to the CATCH Kids Club program. Modifications proposed included a reduction in the number of physical activity sessions from five per week to two or three for ease of implementation. The education component was considered too extensive and complex for use in an after-school setting but the snack component ‘hands-on-approach’ was recommended to be included in future programs because the participants thoroughly enjoyed it and it led to conversations between participants and their parents at home about healthy foods. The retention of program staff was a concern. During the six-month period, the staff turnover was 35% and to combat this, it was recommended staff receive continuous training throughout the entire duration of the program.

A longer-term after-school project has been the Medical College of Georgia (MCG) FitKid Project (Yin et al., 2005). This was a three-year after-school obesity prevention program that focused on improving moderate to vigorous physical activity participation and consumption of health snacks as well as providing homework assistance for academic growth among participants.

The FitKid after-school program was conducted in the Augusta / Richmond County. It involved 18 schools that were randomised into either a control or intervention group. The participants (617) were in second or third grade in 2003 – 2004 and continued into 2005 – 2006 when they were in fifth grade. The program was administered five afternoons per week as this endeavoured to encourage participants to make the FitKid intervention a regular part of their life.
The initial planning processes and the strategies incorporated into the FitKid program are of interest for the future design of long-term programs for overweight and obese children in an after-school setting in terms of retaining participants and staff and obtaining support from parents and schools.

A number of retention strategies were employed. For example, participants were consulted about the types of activities they would like to participate in, and this acted as an intrinsic motivator for their continued involvement. In support of this approach are Cale and Harris (2006) who advocated that when programs focus on activities and skills that are relevant and perceived as being fun by participants it will encourage continued participation. To ensure instructors remained interested in the program the coordinators of the FitKid intervention recruited three to four instructors for each intervention school, and required only two instructors per session, therefore reducing the workload and time commitment of facilitators.

The support of parents and schools is an essential component in any intervention. The FitKid program included two key focuses: improving participant's health and providing assistance with the children's homework as drawcards for parents and schools. To encourage participation, monetary incentives were used, for example, participants received $20 dollars if they completed both body composition assessments at pre and post-tests. Money was also offered to schools with each school receiving $1000 per year for each year of the program, and the intervention schools receiving an additional $1000 annual bonus. To entice parental support, parents received health screening information about their child twice per year. This illustrates interventions can be very expensive and require ample funding.
The FitKid program demonstrates the great commitment and work needed in the design phase of creating a realistic and practical long-term after-school program. Importantly programs must be considered beneficial to not only the participants but to parents and schools themselves.

The Girls Health Enrichment Multi-Site Studies (GEMS) is yet another example of an after-school program (Robinson et al., 2003). This program targeted African-American girls aged between 8 to 10 years and was conducted across four centres which aimed to assess the implementation success of the program and any trends in behavioural and psycho-social measures.

One site was the Stanford GEMS Pilot Study (Robinson et al., 2003). This was a 12 week randomised control trial involving 61 girls. The treatment group participated in culturally specific dance sessions and attended information sessions aimed to reduce their screen time viewing.

The participants of the Stanford GEMS program were eligible to participate if they met a number of criteria: they had to be female, aged between 8 to 10 years, identify as African-American, have a BMI greater than or equal to the 50th percentile for their age and/or at least one of their parents or guardians had to be overweight.

The dance sessions were offered to participants five days per week at three community centres in the local area and the girls were encouraged to attend as many classes as possible during the 12 weeks. Each session was from 3:30pm to 6:00pm and involved a healthy snack, assistance with homework, participation in moderate to
vigorous dance and time allocated to examining the cultural importance of dance to
the African American community. In addition to the dance sessions, there was
another program component: START (Sisters Taking Action to Reduce Television).
This involved a female intervention expert attending each girl’s home and facilitating
a program aimed at reducing television viewing and included the budgeting of
television hours to the participant and her family.

The active control group of the Stanford GEMS study were involved in a health
education program that promoted healthy eating and participation in physical activity.
This encompassed community health lectures and newsletters to parents and the
participants. This was important because it ensured that these participants and their
families were receiving some assistance to help improve their lifestyle and health.

The results of the Stanford GEMS program were very positive and demonstrated that
such a program is feasible in an after-school context to improve the health of girls
who are overweight or obese.

When compared with the active control after the 12 weeks program, the girls in the
treatment group showed many positive trends including a reduced BMI and waist
circumference, an increase in the average counts per minute of physical activity and
minutes involved in moderate-to-vigorous physical activity with a 13% increase in
physical activity between the selected hours of 3pm and 6pm. Additionally a 23%
decrease was reported in media use and a statistically significant decrease occurred in
total household television use. The treatment group also showed a trend towards an
improved liking of physical activity, a significant decline in their weight concerns,
decreased body dissatisfaction and improved school grades. The results demonstrate that a holistic program like the Standard GEMS intervention can have positive benefits on many aspects of an overweight or obese child’s personal and family life.

An important consideration that the Stanford GEMS project must address in its next stage of implementation, or for that matter any after-school program, is the issue of transportation to the venue. The results from the GEMS project revealed that when venues had transportation, the average attendance rate of the girls who attended 2 times per week was 70% in comparison to venues without transport which only had a 30% attendance rate. Transportation is a critical component to the continued participation and involvement of participants. This is especially true with the girls involved in the Stanford GEMS project rating it 1.5 on a 4 point scale where 1 represented being very fun. This further highlights accessibility and transport as two of the biggest obstacles for continued participant involvement and parental support of intervention programs. In addition, this clearly demonstrates the practicalities of conducting programs on school sites.

The attendance rate of parents and participants in the active control group at community lectures, demonstrated that the majority of parents want to be involved and support measures to improve their daughter’s overall health. It is important when designing programs that consideration is given to not only participants but also their families.

The Stanford GEMS study provides future researchers with a greater awareness of what design features are needed to retain participants and enable all involved to
positively benefit. The use of focus groups and formative research prior to designing the program helped ensure that it was realistic and probable for the participants and the community targeted. Additionally the Stanford GEMS team gave much consideration prior to and during program to the girl’s African American culture ensuring that the program was relevant to them. In support of this approach are Cale and Harris (2006) who advocated that programs must be designed to be inclusive and reflective of the groups’ needs, interests, and preferences. Additionally, all facilitators involved in the program were female, who in turn became role models.

Another example of an effective after-school program was the Stanford SPORT Study (Weintraub et al., in press) a randomised controlled trial that was conducted over a six month period. It involved 21 participants of both genders; they had a mean age of 9.9 years and all had a BMI at or above the 85th percentile. The participants were randomly selected into either the sport team group (intervention) or the traditional health education group (control). The study objective was to evaluate the feasibility, acceptability, and efficacy of an after-school team sports program for reducing weight gain among overweight children from a low socio economic background.

The sport team group were involved in sessions initially three days per week but this was extended to four days at the request of participants and parents. The sessions were 2.25 hours in length with 75 minutes dedicated to participation in physical activity. The program was structured so that one session per week was dedicated to a competitive game and the remaining days were focused on practicing the skills of the chosen sport. Soccer was selected because the researchers deduced that soccer was the most popular sport amongst children in the targeted community.
In contrast, the control group received 25 information based nutrition and health education sessions which consisted of weekly after-school meetings. This highlights the importance of ensuring control groups are ‘active’ and are able to benefit from being involved. Furthermore, the program retained 100% of its participants and is likely to be attributed to the relevance of the program’s design and implementation to the participants.

The results showed that 100% of the children in the intervention group and 42% in the control group had reduced BMI \( z \) Scores at three and six months, with statistically significant reductions in the intervention group BMI \( z \) Score at three months \((p<0.03)\) and six months \((p<0.04)\). Additionally, moderate to vigorous physical activity increased from 22.96 (baseline) to 24.81 (three month follow up) minutes, vigorous activity rose from 7.06 to 9.21 minutes, small screen time weekly viewing decreased by 3.42 hours and self-esteem had improved by 2.67 units at three months for the intervention group.

The Stanford SPORT Study highlighted that an after-school intervention that focuses on team activity for obese children can effectively and positively impact upon the causal factors for childhood obesity. This is verified further given 66% of participants in the intervention group at baseline had never participated in team sport yet at the six-month follow up, 89% stated they would like to continue their participation in team soccer.

In an Australian context, the most nationally recognised after-school physical activity sport program is the Active After-School Communities Program (Australian Sports
It is a national program that provides primary school children who are generally inactive (they do not need to be overweight or obese) to a free structured physical activity program during the after-school period of 3 to 5:30pm. Primary schools can apply for funding if they wish to conduct the program after-school at their school site but the program is also able to be facilitated by any sporting organisation or club and private providers of junior sport programs. In all instances, the Active After-School Communities Program must be facilitated during the after-school time period.

The aim by August 2007 was to have 3250 primary schools involved, which equates to 150,000 children participating in physical activity during the after-school time period (Australian Sports Commission, 2006). As yet no comprehensive analyses of the Active After-School Communities Program have been completed, although the Australian Sports Commission has sought consultation for an evaluation of the program. As such, the true impact of this program on overweight and obese children's physical activity participation is yet to be established. This is particularly important given that the program is eligible to all primary school students, many of whom are likely to be more skilled and competent in physical activity, which may be intimidating to an overweight or obese child. Furthermore Storch et al (2006) suggests that overweight children avoid partaking in physical activity to avoid weight related teasing.

An investigation of the Active After-School Communities Program's design does provide some possible indicators as to why it has been so well supported nationwide. Firstly all primary schools involved are provided with support and the
provision of funds to establish the program. Secondly, all deliverers of the program must be accredited with specific training with both these factors helping to ensure program consistency. And of great importance is the program’s objective of creating community links in an effort to provide opportunities for children to continue to participate in physical activity outside of the program. Whether this continued involvement in physical activity continues beyond the program is yet to be confirmed, but Boon and Clydesdale (2005) suggest programs must be long-term in order to maintain improvements and changes in body composition and behaviour.

Four important elements should be considered when designing an intervention for children who are overweight or obese to develop their physical activity self-efficacy. Trost, Kerr, Ward and Pate (2001) summarise these elements: the program must be enjoyable and contain appropriate activities that all children can be successful at, there must be opportunities for participants to observe influential others, facilitators need to verbally encourage participants and their involvement in physical activity and lastly competition or grading needs to reduced and / or eliminated. Appropriate intervention design, adequate planning, training of facilitators and consultation with participants would assist in ensuring these four elements are incorporated.

There is no ‘ideal’ design model for interventions to prevent and treat childhood obesity, however the successes of past interventions can be and should be modelled and implemented in future programs. The after-school period is becoming more favourable for childhood obesity programs because it is considered a critical window due to the discretionary time available to children and if one behaviour is targeted such as physical activity than this can indirectly impact upon others including small
screen viewing and diet due to the limited opportunity to participate in them (Robinson & Sirard, 2005).

From the examples discussed, there are general design characteristics that have been effective in achieving the desired objectives of increased participation in physical activity and improved physical and psychosocial health. These include extensive planning prior to commencement and implementation, that programs are multi-faceted in nature, the interventions benefit all, activities included are relevant, appropriate and enjoyable for all participants, facilitators are motivated and knowledgeable, attendance at the program is easily accessible, and where possible, programs are able to be conducted for an extended period.

2.5 THEORETICAL FRAMEWORK

The foundations for interventions that target and prevent childhood obesity can be formulated from numerous theoretical paradigms.

The Social Cognitive Theory by Bandura (1986) is one example. This established that human functioning and human behaviour is explainable in the form of a triadic reciprocality model. The model (Figure 1) suggests that behavioural, cognitive, and other personal factors as well as environmental factors all function interactively as determinants of each other.
This model emphasises the importance of creating child obesity interventions that are holistic in nature rather than just isolating and focusing on one particular element. The programs previously outlined demonstrate the successes and benefits of programs that focus on multiple rather than individual factors.

Additionally, Robinson, Dina, and Borzekowski (2006) suggest that Bandura’s Social Cognitive Theory contains four central processes that influence learning and the adoption of new behaviours. These are attention, retention, production, and motivation. It is these key areas that child obesity interventions should focus on in order to alter ‘unhealthy’ behaviours. To ensure interventions are motivating for participants Robinson and Sirard (2005) suggest this is achievable by including physical activities and games that are fun, challenging, rewarding, individualised, involve opportunities for social interactions and all participants are able to be successful.
Another theoretical framework is the creation of a *Mastery-Orientated* Environment. Yin et al. (2005) explained and related a Mastery-Orientated Environment to a physical activity targeted intervention for overweight and obesity children. By suggesting that such an environment is created when great importance is placed on participant’s effort, there is an emphasis on participant’s learning and improving, the activities included are enjoyable and age appropriate, success is achieved by all and cooperation between participants exists. The inclusion of these elements can be considered intrinsic motivators for participation in physical activity, because participants gain a great sense of physical activity competence and confidence.

Social Cognitive Theory and Mastery-Orientated Environment focus on the motivators to change behaviour. Yet some question whether they in fact target the motivators for participants to engage in an intervention. Therefore, another model that can be considered for use in an intervention for overweight and obese children is a *Stealth or ‘Indirect’ Intervention* (Robinson & Sirard, 2005).

A stealth intervention aims to identify target behaviours that are motivating in and of themselves and then focus upon these in order to promote or reduce the desired behaviours (Robinson & Sirard, 2005). This approach to date has been used by Robinson et. al (2003) which centred on reducing children’s television and small screen time viewing hence indirectly increasing participant’s involvement in physical activity.

The theoretical underpinnings of the Social Cognitive Theory, Mastery-Orientated Environment, and Stealth Intervention models should act as important frameworks in
the design and implementation of after-school programs for overweight and obese children.
CHAPTER III: METHODOLOGY

The purpose of this study was to assess the feasibility, acceptability, and potential efficacy of an after-school homework club, physical activity and sport program for primary school girls. This chapter will describe the research design, participants, instrumentation, procedures, and statistical analysis used to conduct this study.

3.1 RESEARCH DESIGN OF THE STUDY

This research was a single group, proof-of-concept study, with data collected from a small group of primary school girls.

The single group, proof-of-concept design was used in this study to assess the possible affect and influence that the Wollongong Sport Program, an after-school homework club, physical activity and sport program could have on primary school girls while also determining the feasibility, acceptability and potentially efficacy of such a program. Data were collected before the commencement and at the completion of the program on the following variables: participants’ BMI, BMI z Score, waist circumference, self-esteem, self-concept, perceived competence and health-related quality of life. Additionally process evaluations were collected throughout the entire program and these included participant enjoyment, attendance records, and facilitator reflections.
Conducting this study as a single group proof-of-study concept provides invaluable information on the creation and modelling of future programs that could be conducted after-school and on school sites.

3.2 SAMPLE SELECTION

3.2.1 SELECTION OF SCHOOL SITE
Three primary schools in the Illawarra region of New South Wales were targeted as potential sites for conducting the after-school program because of their facilities, particularly field space and under cover play areas and location in low socio-economic areas. These schools were then approached and briefed about the project. These discussions provided knowledge as to whether each individual school would have sufficient numbers of suitable participants. The objective was to have all participants in the Wollongong Sport Program from just one primary school to eliminate the need for transportation to and from the school site.

One school was then selected as the site of the program, due to the school’s indoor and outdoor facilities and because the school student population was large enough to draw the required number of participants to the program.

3.2.2 SELECTION OF PARTICIPANTS
At the selected primary school, girls aged between 8 and 10 years of ages were targeted as potential participants. School executive staff initially identified girls who they believed would benefit most from being involved in the after-school homework club, physical activity, and sport program based upon their teacher-professional
judgement and observations. The *Wollongong Sport Program* was then promoted to the prospective girls at a parent teacher evening conducted by the school. A brief letter outlining the program was given to each parent of a prospective participant (Appendix A).

Thirteen girls expressed interest in participating in the program. Two orientation sessions were conducted prior to the commencement of the program. This enabled the girls to have a better understanding about the program without any continued obligation to participate in the *Wollongong Sport Program*. At the completion of the orientation sessions, information packages containing detailed information were given to parents (Appendix B) and to participants (Appendix C).

All thirteen participants from the orientation sessions consented to their involvement in the *Wollongong Sport Program*. The participants were accepted once they had returned an assent form that had been signed by themselves and a consent form signed by their parents (Appendix D).

### 3.3 INSTRUMENTATION

The instruments used to measure the variables in this study were:

- PedsQL Pediatric Quality of Life Inventory Child Report (Ages 8 – 12), Version 4 (Varni, 1998)
- PedsQL Pediatric Quality of Life Inventory Parent Report for Children (Ages 8 – 12), Version 4 (Varni, 1998)
- Self-Perception Profile for Children (Harter, 1985)
3.3.1 PEDSQL PEDIATRIC QUALITY OF LIFE INVENTORY

The participant’s health-related quality of life was measured using the PedsQL Pediatric Quality of Life Inventory report. This study used both the parent and child versions to assess differences and similarities between what the participants believed their health-related quality of life to be and what their parents considered their daughter’s health-related quality of life as being.

The parent and child version of PedsQL are almost identical. Both are a 23-item generic core scale questionnaire that measures the principal dimensions of health and the role of the school. The four dimensions/scales are:

- Physical Functioning
- Emotional Functioning
- Social Functioning
- School Functioning

Each participant and parent was required to complete either the Child or the Parent PedsQL report both pre and post involvement in the Wollongong Sport Program. The questionnaire required approximately five minutes of time to complete.

To complete the report the participant and parent individually, without any discussion or input, had to consider a list of things that might be a problem for themselves (participant) or their daughter. Then for each item they needed to indicate by circling on a scale from zero through to four, with zero indicating never a problem to four
being almost always a problem the degree to which that ‘thing’ had been a problem within the last month. An example question from the PedsQL Child report (Ages 8 – 12), is provided in Figure 2.

<table>
<thead>
<tr>
<th>ABOUT SCHOOL (Problems with...)</th>
<th>Never</th>
<th>Almost</th>
<th>Some-</th>
<th>Often</th>
<th>Almost</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. I forget things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. An Example Question from PedsQL Pediatric Quality of Life Inventory Child Report (Ages 8 – 12)

The difference between the Child and Parent PedsQL reports is the phrasing of items. The Children PedsQL version phrases statements so that they are personalised towards the child through the use of the words “I”, “me” and “my.” For example, statement two, “It is hard for me to run.” In comparison the Parent PedsQL version, uses statements that are not directive like the child version, but are more general, for example, statement two, “running.”

3.3.1.1 VALIDITY AND RELIABILITY OF PEDSQL
Varni, Limbers and Burwinkle (2007) contend that most of the children self-report scales across all age subgroups exceed the minimum reliability standard of 0.70, necessary for group comparisons. Further, they added that the PedsQL reports exceed the reliability criteria of 0.9, required when analysing individual domain scores.
Varni, Seid and Kurtin (2001) administered the PedsQL Version 4.0 report to 963 children and 1629 parents. The results showed that the internal consistency reliability for the Total Scale Score (alpha = 0.88 child, 0.90 parent report), Physical Health Summary Score (alpha = 0.80 child, 0.88 parent), and Psychosocial Health Summary Score (alpha = 0.83 child, 0.86 parent) were acceptable for group comparisons. To determine the validity, known-groups method, correlations with indicators of morbidity and illness burden and factor analyses were used (Varni, Seid & Kurtin, 2001).

3.3.1.2 SCORING FOR PEDSRL

To score both the Child and Parent PedsQL the four scale: physical functioning, emotional functioning, social functioning and school functioning are categorised together on the questionnaire for scoring ease.

To score each dimension a certain number of items from the questionnaire are tallied together. Each dimension and the number of items tallied are:

- Physical Functioning – eight items
- Emotional Functioning – five items
- Social Functioning – five items
- School Functioning – five items

The PedsQL also enables two other scores to be determined; these are a psychosocial health summary score and a physical health score. To ascertain these scores the following dimensions are tallied together:
- Psychosocial Health Summary Score - is the sum of all responses from the Emotional, Social and School Functioning scales
- Physical Health Summary Score – is the same score as the Physical Functioning Scale Score.

For each item on the PedsQL questionnaire, the participant and their parent had to read it and consider the degree to which that item has been a problem during the past month and then determine which option was most suitable. The five options ranged from never, almost never, sometimes, often and almost always. Each of the five options had a score from zero to four. Once each participant and parent had selected the option that was most suitable they needed to circle or cross only the appropriate corresponding number. Figure 3 outlines the options and scoring for the Parent and Child PedsQL Pediatric Quality of Life Reports.

<table>
<thead>
<tr>
<th>Response Choices</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Figure 3. *Options and Scoring for the Parent and Child PedsQL Pediatric Quality of Life Reports*

A lower total sum suggested a higher health-related quality of life.
3.3.2 SELF-PERCEPTION PROFILE FOR CHILDREN

The participant’s self-concept, self-esteem, and perceived competence were measured using the Self-Perception Profile for Children (Harter, 1985) (Appendix H). This instrument is a 36-item questionnaire devised around five specialised domains and global self worth.

- Scholastic Competence: abilities within the realm of scholastic performance.
- Social Acceptance: degree to which a child feels popular and accepted.
- Athletic Competence: capabilities in sport and outdoor games.
- Physical Appearance: degree to which someone feels about the way they look.
- Behavioural Conduct: degree to which someone likes the way they behave, and / or does the right thing.
- Global Self Worth: Extent to which someone likes oneself, it signifies a global judgement of one’s worth as a person (Harter, 1985).

To assist the participants in correctly completing the Self-Perception Profile for Children questionnaire, a facilitator used the one sample question to provide a step-by-step guide to answering the questions.

Firstly, participants had to read each question. Secondly, they needed to decide which kind of “child” they were most like from the two options and then circle the option that was most like them. Lastly, the participants needed to decide if the statement they had selected was “sort of true” or “really true” for them. This was indicated by the participant ticking or crossing the appropriate box. An example of a question is provided in Figure 4.
Really true for me
Sort of true for me
Some kids usually do the right thing
BUT
Other kids often don't do the right thing

Figure 4. An Example of a Question from the Self-Perception Profile for Children

3.3.2.1 VALIDITY AND RELIABILITY OF THE SELF-PERCEPTION PROFILE FOR CHILDREN

Muris, Meesters and Fijen (2003) conducted a study with a sample of 143 subjects to study the reliability including the internal consistency and test re-test stability and validity of the Self-Perception Profile for Children. They concluded that the internal consistency was acceptable with Cronbach's Alphas ranging between 0.73 and 0.81 and the test re-test stability was good with correlation coefficients 0.84 or higher.

Validity of the Self-Perception Profile for Children has been established. It was administered to three separate samples of 3rd to 8th grade children. The factor loadings for each of the domains were considerable with the average cross loading factors ranging between only 0.04 and 0.08 (Harter, 1985). More recently, validity was also analysed and determined by an investigation of the Self-Perception Profile for Children and its association with various other scales that focused upon psychopathological and personality factors (Muris, Meesters & Fijen, 2003).
3.3.2.2 SCORING FOR SELF-PERCEPTION PROFILE FOR CHILDREN

Each question in the questionnaire was given a score from ‘1’ to ‘4’. Low perception of a participant’s competence was rated with a score of ‘1’ whereas a high perception of competence was given a score of ‘4’. An example of this scoring system is provided in Figure 5.

| Really true for me | Sort of true for me | 4 | Some kids usually do the right thing | BUT | Other kids often don’t do the right thing | 2 | 1 |

Figure 5. An Example of a Question from the Self-Perception Profile for Children and its Scoring

3.3.3 PROCESS EVALUATION

Process evaluation data were collected throughout the entire duration of the Wollongong Sport Program. These consisted of participant enjoyment scales, facilitator reflections and debriefing sessions.

3.3.3.1 PARTICIPANT ENJOYMENT SCALES

At the end of each session, participants were asked to evaluate the activities they had participated in during the physical activity component of the Wollongong Sport Program.
Program using an enjoyment scale (Appendix I). The scale revealed the extent to which each girl enjoyed or did not enjoy the activities.

Additional space was provided at the bottom of the enjoyment scale so participants could advise the facilitators of the Wollongong Sport Program what additional activities and games they enjoy and would like to see included in future sessions.

3.3.3.2 FACILITATOR REFLECTIONS

At the completion of each session, the facilitators typed up and filed personal reflections (Appendix J). The reflections included what was successful and what was not successful and the reasons why, areas for improvement, comments about what they perceived the level of participant enjoyment to be, notes on the suitability and benefits of games and activities that had been implemented as well as comments on participants' behaviour and interactions.

3.3.3.3 DEBRIEFING SESSIONS

Debriefing sessions occurred once a week and involved the facilitators and research supervisor. During the debriefings, discussions were focussed upon the previously completed session particularly the successes and the aspects that needed modifying. Minutes of each debriefing session were typed and filed.

Outcomes and proposals arising from debriefing sessions were conveyed to the assistants in the program either by email or by discussions with a facilitator.
3.3.3.4 ATTENDANCE RECORDS

At the beginning of each session once the participants had changed into their Wollongong Sport Program t-shirt and were seated awaiting instructions, a program facilitator marked the attendance record (Appendix K). The record detailed which of the participants were in attendance and those who were absent. The attendance record was typed and filed.

3.3.3.5 SCORING FOR PROCESS EVALUATIONS

Each process evaluation were scored using a different method.

3.3.3.5.1 SCORING FOR PARTICIPANT ENJOYMENT SCALES

The enjoyment scales were scored by giving each possible answer a numerical value as shown in Figure 6.

<table>
<thead>
<tr>
<th>Really Disliked</th>
<th>Disliked</th>
<th>Neither liked nor Disliked</th>
<th>Liked</th>
<th>Really Liked</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Sad Face" /></td>
<td><img src="image" alt="Sad Face" /></td>
<td><img src="image" alt="Neutral" /></td>
<td><img src="image" alt="Happy" /></td>
<td><img src="image" alt="Very Happy" /></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

*Figure 6. Enjoyment Scales and its Numerical Value*
After each session the scores were tallied and averaged to ascertain how much each activity was liked by the participants and how each participant liked the session as a whole.

The calculation of scores after each session enabled the Wollongong Sport Program facilitators to compare the level of enjoyment of particular activities and individual participants for each session, monitor enjoyment levels throughout the program as well as assessing if the aim of high levels of enjoyment was achieved.

3.3.3.5.2 SCORING FOR FACILITATOR REFLECTIONS

Each facilitator of the Wollongong Sport Program typed after each session individual reflections and these were maintained in a program folder to enable regular formative evaluation.

3.3.3.5.3 SCORING FOR DEBRIEFING SESSIONS

Each weekly debriefing was typed and filed in a folder. This allowed for easy access, which enabled the facilitators to ensure that suggested changes, modifications and any proposals were not forgotten.

3.3.3.5.4 SCORING FOR ATTENDANCE RECORDS

At the completion of each session, the number of participants who were in attendance and the number of participants absent were tallied. Calculations were then completed for each session to determine the percentage of participants who were present. This
enabled the facilitators to determine whether the objective of 80% attendance had been achieved for that session.

3.4 DEMOGRAPHICS

3.4.1 GENDER

All participants in the *Wollongong Sport Program* were primary school aged girls.

3.4.2 AGE

Participants specified their date of birth on the pre-test Self-Perception Profile for children questionnaire. Each participant’s date of birth was recorded in the following format DD/MM/YY. For example, the date for a participant born on 7th April 1998 was recorded as 07/04/98.

Each participants exact age was then determined from the date of baseline testing, which was the 30th April 2007. For example, a participant born on 07/04/2007 was 9 years and 21 days at pre-test.

Additionally all participants’ ages were recorded in years, closest to the half year. For example, a participant who was 9 years and 4 months was recorded as being 9.5 years of age.
3.4.3 ANTHROPOMETRY

Each participant’s height and weight were assessed before the program began to calculate their body mass index (BMI) and BMI $z$ Score. Waist circumference was also calculated as a measure of regional body fat distribution.

Other variables were assessed during the program including resting heart rate and cardiovascular fitness. These variables are not reported, as they are not part of this thesis.

3.5 SUMMARY OF INSTRUMENTATION METHODS

A summary of the variables measured and the instruments used in this study is shown in Table 1.
Table 1. *Summary of the Variables Measured and Instruments used*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adiposity</td>
<td>• BMI</td>
</tr>
<tr>
<td></td>
<td>• BMI z Score</td>
</tr>
<tr>
<td>Health-Related Quality of Life</td>
<td>• PedsQL Pediatric Quality of Life Inventory Child Report, Version 4 (Varni, 1998)</td>
</tr>
<tr>
<td></td>
<td>• PedsQL Pediatric Quality of Life Inventory Parent Report for Children, Version 4 (Varni, 1998)</td>
</tr>
<tr>
<td>Self-Concept, Self-Esteem and Perceived-Competence</td>
<td>• Self-Perception Profile for Children (Harter, 1985)</td>
</tr>
<tr>
<td>Process Evaluations</td>
<td>• Participant Enjoyment Scales</td>
</tr>
<tr>
<td></td>
<td>• Facilitator Reflections</td>
</tr>
<tr>
<td></td>
<td>• Debriefing Sessions</td>
</tr>
<tr>
<td></td>
<td>• Attendance Records</td>
</tr>
</tbody>
</table>
3.6 PROCEDURES

3.6.1 AUTHORISATION

Authorisation to conduct this study was required from the University of Wollongong Human Research Ethics Committee, the New South Wales Department of Education and Training and the participants and their parents involved in the Wollongong Sport Program.

3.6.1.1 UNIVERSITY OF WOLLONGONG HUMAN RESEARCH AND ETHICS COMMITTEE

The University of Wollongong Human Research Ethics Committee granted approval for this study to be conducted (Appendix L). All requirements were satisfied prior to the commencement of data collection.

3.6.1.2 NEW SOUTH WALES DEPARTMENT OF EDUCATION AND TRAINING

The New South Wales Department of Education and Training granted approval for this study to be conducted (Appendix M). All requirements were satisfied prior to the commencement of data collection.
3.6.1.3 PARTICIPANTS AND PARENTS

All 13 participants and their parents were provided with parent and child information sheets and consent forms prior to the commencement of the *Wollongong Sport Program*.

Participants and parents were informed that the outcomes from this study would remain strictly confidential. They were also advised of any possible risks involved with their participation and instructed that their withdrawal from this study would not jeopardise in any way their present or future relationship with the University of Wollongong.

Participants and parents were also acquainted with the procedures of expressing concern in relation to the research process through the University of Wollongong’s Human Research and Ethics Committee.

3.6.2 TREATMENT

All 13 primary school girls completed the *Wollongong Sport Program*. The program ran after-school at the participant’s school site twice a week for 1 hour and 45 minutes from 3:15pm – 5:00pm, for nine weeks (one school term).

3.6.2.1 WOLLONGONG SPORT PROGRAM

The after-school homework club, physical activity, and sport program central goals were to increase the physical activity rates of the participants, to encourage
involvement in life long physical activity, to improve their self-confidence, self-esteem, perceived competence and provide academic support.

A summary schedule of each *Wollongong Sport Program* session is provided in Table 2.
<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>What was Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:15 – 3:30pm</td>
<td>• Participants finished school and arrived at the meeting place</td>
</tr>
<tr>
<td></td>
<td>• Participants changed into</td>
</tr>
<tr>
<td></td>
<td><em>Wollongong Sport Program</em> t-shirt</td>
</tr>
<tr>
<td></td>
<td>• Attendance collected</td>
</tr>
<tr>
<td></td>
<td>• Participants had an afternoon snack consisting of fruit and water</td>
</tr>
<tr>
<td>3:30 – 4:00pm</td>
<td>• Participants complete their assigned homework with assistance from facilitators and assistants</td>
</tr>
<tr>
<td>4:00 – 4:55pm</td>
<td>• Participants participate in physical activities and games</td>
</tr>
<tr>
<td>4:55 – 5:00 pm</td>
<td>• Participants complete session evaluations</td>
</tr>
<tr>
<td></td>
<td>• Parents collect their daughter</td>
</tr>
</tbody>
</table>
The physical activity and sport component of the *Wollongong Sport Program* enabled all participants to have the opportunity to partake in various activities and games that were fun, challenging, individualised and allowed every participant to be successful. The program was conducted in an environment that promoted and encouraged positive social interaction between the participants and facilitators while also providing girls with encouragement and constructive feedback. This was purposeful in having the participants view physical activity as something that is enjoyable and something they should do on a regular basis. The three focus ‘sports’ of the program were:

- Basketball / Netball
- Soccer
- Hip-Hop Dance

Each ‘sport’ of the *Wollongong Sport Program* was allocated five sessions. All activities and games in a session were centred on the skills and concepts of the ‘sport’ of focus, a summary of these are in the Table 3, Table 4 and Table 5.
### Table 3. The Skills and Concepts involved in the Basketball / Netball Sessions

<table>
<thead>
<tr>
<th>'Sport'</th>
<th>Skills and Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball / Netball</td>
<td>• Catching and Throwing</td>
</tr>
<tr>
<td></td>
<td>• Dribbling</td>
</tr>
<tr>
<td></td>
<td>• Attack and Defence</td>
</tr>
<tr>
<td></td>
<td>• Goal Shooting</td>
</tr>
<tr>
<td></td>
<td>• Working as a Team</td>
</tr>
</tbody>
</table>

### Table 4. The Skills and Concepts involved in the Soccer Sessions

<table>
<thead>
<tr>
<th>'Sport'</th>
<th>Skills and Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soccer</td>
<td>• Dribbling</td>
</tr>
<tr>
<td></td>
<td>• Kicking</td>
</tr>
<tr>
<td></td>
<td>• Trapping</td>
</tr>
<tr>
<td></td>
<td>• Shying (Throw-Ins)</td>
</tr>
<tr>
<td></td>
<td>• Goal Shooting</td>
</tr>
<tr>
<td></td>
<td>• Goal Keeping</td>
</tr>
<tr>
<td></td>
<td>• Working as a Team</td>
</tr>
<tr>
<td></td>
<td>• Attack</td>
</tr>
</tbody>
</table>

73
Table 5. *The Skills and Concepts involved in the Hip-Hop Dance Sessions*

<table>
<thead>
<tr>
<th>‘Sport’</th>
<th>Skills and Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hip-Hop Dance</td>
<td>• Stretching</td>
</tr>
<tr>
<td></td>
<td>• Moving to beat of the music</td>
</tr>
<tr>
<td></td>
<td>• Individual Creative Steps</td>
</tr>
<tr>
<td></td>
<td>• Hip-Hop Steps</td>
</tr>
<tr>
<td></td>
<td>• Hip-Hop Sequences</td>
</tr>
<tr>
<td></td>
<td>• Learning and performing</td>
</tr>
<tr>
<td></td>
<td>hip-hop routine</td>
</tr>
</tbody>
</table>

Each session (Appendix N) was directed towards the participants being involved in numerous quick games and activities rather than a focus towards correct technique and skill development. All sessions started with a fast-paced warm-up activity to increase the participant’s heart rate, warm muscles as well as to excite and motivate the girls about the session they were about to participate in. The participants were then lead by a facilitator through a variety of stretches. Afterwards the girls were involved in three or four games and activities these were either full sided, small sided, individual, competitive, non-competitive or challenge based. The concluding activity of each session was a slower-paced activity that was aimed to gradually decrease the girl’s heart rate.
In the last session of each ‘sport’, the girls participated in a modified game version of that particular sport. For dance, the girls performed their hip-hop dance routine for their parents, extended families, and school staff.

A Wollongong Sport Program folder was created that contained all information about the program. This included all session plans, resources needed, enjoyment scales and facilitator reflections and recommendations.

3.6.3 DATA COLLECTION

Data were collected at the commencement and conclusion of the Wollongong Sport Program as well as during its implementation by the programs facilitators.

3.6.3.1 WOLLONGONG SPORT PROGRAM FACILITATORS

The program facilitators were the researchers involved in this study.

The chief facilitators’ pre-service educational training in a physical and health education degree and 18 years participation in physical activity provided the required skills and knowledge to create, devise and implement the program.

The two other facilitators of the program have university degrees in the health field and their expertise and abilities were of assistance in the planning and implementation of the program.
Three other individuals supported the facilitators; two were in their pre-service educational training for a physical and health education degree, and the other was a Year 11 high school student. Each of the assistants assisted with one of the three ‘sports’. One assistant for many years has participated in numerous sports including netball and basketball, another assistant has played soccer at both regional and state level and the final assistant has danced for many years and is a qualified dance instructor. Their experiences and expertises assisted in the planning and implementation of the program.

All facilitators and assistants were female and under 25 years of age.

### 3.6.3.2 HEALTH-RELATED QUALITY OF LIFE

Each participant and their parent’s perspective of their daughters health-related quality of life was assessed pre-involvement and post-involvement in the *Wollongong Sport Program*.

The PedsQL Pediatric Quality of Life Inventory Child Report was conducted prior to any other form of assessment being completed. All participants completed it at the same time and in the same room.

All of the girls were given a copy of the PedsQL Pediatric Quality of Life Inventory Child Report, Version 4. A facilitator of the *Wollongong Sport Program* provided the participants with an explanation of the questionnaire; that it was not a test and there were no right or wrong answers and the questions were about how they feel and what they think about their own health.
A demonstration of how to complete the questions was shown on a white board in front of all participants. Individually the girls read each of the 23 questions and selected the option that best represented their own health and lives. If participants had any questions or did not understand what the questionnaire was asking, they were able to ask for assistance. Once completed the questionnaires were collected.

At the conclusion of the pre-test and session 14, each participant was given an envelope containing one copy of the PedsQL Pediatric Quality of Life Inventory Parent Report, a letter (Appendix G) explaining the purpose of the questionnaire, instructions on how to complete it as well as information regarding when and who it needed to be returned to. Facilitators ensured that contact was made with each parent/s, to inform them of what was required and to answer any questions or concerns about the completion of the PedsQL questionnaire.

3.6.3.3 SELF-PERCEPTION PROFILE FOR CHILDREN

The participants self-concept, self-esteem and perceived competence were assessed using the Self-Perception Profile for Children both pre and post involvement in the *Wollongong Sport Program*.

The Self-Perception Profile for Children was conducted after the participants had a five-minute break after completing the PedsQL Pediatric Quality of Life Inventory Child Report. All participants completed the Self-Perception Profile in the same room. Due to time constraints and the objective of having all pre-testing completed in one session, participant’s one at a time were called by one facilitator to leave the room for
their anthropometry testing. When called the participant left their Self-Perception Profile questionnaire and upon returning, completed the remaining items.

Each participant was given a copy of the Self-Perception Profile for Children. Facilitators of the program emphasised to the girls that the questionnaire was not a test, there were no right, or wrong answers and that every person is unique.

An explanation and demonstration on how to answer each question was performed using a white board and sample question by a facilitator. To complete the questionnaire participants needed to read each statement, decide whether they were more like the child on the left or right of the statement, and then circle that option. From the option circled the participant then had to make a decision whether the statement was sort of true for them or really true for them and tick the corresponding box.

If participants had any questions or did not understand what the questionnaire was asking, they were able to ask for assistance. Once completed, the questionnaires were checked by a facilitator to ensure the participant’s circled option and ticked box were from the same side.

3.6.3.4 PROCESS EVALUATIONS

At the conclusion of each session, the participants completed an enjoyment scale. The scale enabled the girls to reveal to the facilitators whether they really liked, liked a little, neither liked or disliked, disliked a little or really disliked each activity by ticking the corresponding box. Additional space was provided for the girls to suggest
activities or games that they would like the facilitators to consider for inclusion in future sessions.

The *Wollongong Sport Program* was also evaluated using facilitator reflections and debriefings. Each facilitator individually reflected on each session. These perspectives formed the basis of the teams debriefing held each week with the research supervisor. During these meetings, changes and suggestions for future sessions were considered and decisions made.

### 3.6.3.5 ANTHROPOMETRY

At the beginning and completion of the program, each participant's height and weight were recorded. These data were used to calculate each individual's body mass index (BMI) and BMI z Score. Waist circumference was also assessed as a measure of regional fat distribution.

Individually each participant had their anthropometry measurements determined and recorded in a separate and private room away from where the Self-Perception Profile for Children questionnaires were being completed.

Each participant was asked to remove her shoes and socks and any bulky items of clothing for example jumpers or jackets. Weight was measured using Tanita electronic bathroom scales that had been calibrated prior to testing. Weight was recorded to the nearest 0.1 kilogram (kg).
Height was determined using a portable stadiometer and was recorded to the nearest 0.1 centimetre (cm) and was converted to metres (m).

Waist circumference was assessed by asking the participant to stand on a chair as this assisted in ensuring that measurements were taken at the correct position. The facilitator used a measuring tape and recorded the waist circumference to the nearest 0.1 centimetre (cm).

The positioning of the tape was determined by locating the mid point between the top of the iliac crest and the bottom of the rib cage, approximately the position of the iliac crest. The tape was positioned under the participants t-shirt in a horizontal position. A measurement was recorded when the participant was relaxed and exhaling.

3.6.4 DATA ENTRY

All data collected were coded prior to entry with each participant being assigned a pseudonym to ensure their confidentiality.

All data gained from the PedsQL Child Report, PedsQL Parent Report, Self-Perception Profile for Children, Process Evaluations, height, weight, BMI, BMI z Score and waist circumference were initially entered into a Microsoft Excel spreadsheet. A different spreadsheet was created for pre-test and post-test data. This data was then transferred into SPSS Version II.
All qualitative data including facilitator reflections and debriefings were typed in Microsoft Word. This information was filed in individual documents focusing upon each session.

3.7 STATISTICAL ANALYSIS

Valid and reliable instruments were used to measure the variables being investigated in this study using standardised procedures. When data collection and data entry were complete, statistical analyses were performed.

3.7.1 VARIABLES

Scientific research including this study investigates independent and dependent variables. The independent variable is the factor that is measured or manipulated (Tuckman, 1994) whereas the dependent variable is the factor that is being observed and measured to determine the effect of the independent variable (Mertens, 2005).

In this study, the independent variable was the Wollongong Sport Program. The dependent variables were BMI, BMI z Score, Waist Circumference, Perceived Competence and Quality of Life.

3.7.2 HEALTH-RELATED QUALITY OF LIFE

The PedsQL Pediatric Quality of Life Inventory Child Report and the PedsQL Pediatric Quality of Life Inventory Parent Report for Children (Varni, 1998) were
administered to determine what each participant and their parent considered the child's quality of life to be. The following procedures were completed:

- All questions in the questionnaire had a score range from '0' to '4' with '0' indicating never and '4' representing almost always. Each participant's scores for each item were entered into a spreadsheet. Individual scores for each participant were tallied for each of the four domains as well as a total score for psychosocial health and a physical health score recorded.
- These data were then entered into SPSS Version II and dependent sample t-tests were calculated for the participant's quality of life at baseline and follow-up.

3.7.3. SELF-PERCEPTION PROFILE FOR CHILDREN

The Self-Perception Profile for Children (Harter, 1985) was administered to determine a participant's perceived level of competence. The following procedures were completed:

- All questions in the questionnaire were given a score from '1' to '4' this reflected a low to high level of perceived competence. Every participant's scores for all questions were entered into a spreadsheet. Individual scores for each girl were tallied for each of the six domains and a total score recorded for the questionnaire.
- This data was then entered into SPSS Version II and dependent sample t-tests were calculated for the perceived competence of the participants at baseline and follow-up.
3.7.4 PROCESS EVALUATIONS
The enjoyment level of each session was assessed using an enjoyment scale. A number of statistical analysis procedures occurred, these include:

- The girls involved in the program individually completed an enjoyment scale. This revealed how much they enjoyed or did not enjoy each activity they had participated in at each session. The participants ranked their enjoyment on a scale from 1 to 5, with ‘1’ representing really disliked and ‘5’ signifying really liked.
- The results for each participant were recorded in Microsoft Excel. This data was then used to calculate the mean and standard deviation enjoyment of each session and an overall score for each of the three ‘sports’ of the Wollongong Sport Program.

3.7.5 ANTHROPOMETRY
Each participant’s BMI, BMI z Score and waist circumference were assessed. A number of statistical analyses were performed, these include:

- The participants BMI (weight and height measurements), BMI z Score and waist circumference were entered into Microsoft Excel.
- BMI z Score was calculated using the lmsGrowth menu option calculator (http://homepage.mac.com/tjcole/FileSharing1.html) using the participants’ data: gender, height and weight at both pre-test and post-test.
• These data were then entered into SPSS Version II and dependent sample t-tests were calculated for the participant's BMI, BMI z Score and waist circumference at baseline and follow-up.
CHAPTER IV: RESULTS

This study was conducted to determine the feasibility, acceptability and potential efficacy of an after-school homework club, physical activity and sport program for primary school girls. Results from data collected are reported in relation to the research questions that guided this investigation.

4.1 SAMPLE

The sample for this study consisted of 13 primary school girls between the ages of 8 and 10 years who were identified by the school as students who may benefit the most from the program due to low levels of perceived physical competence, actual competence, and enjoyment of physical activity or who were overweight or obese. All girls continued with the Wollongong Sport Program for the entire nine weeks. Thus, the results obtained are from a total sample of thirteen participants. Table 6 reports the baseline characteristics of the sample.
Table 6. Baseline Characteristics of Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (Standard Deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>9.38 (0.77)</td>
</tr>
<tr>
<td>Height (m)</td>
<td>1.38 (0.06)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>40.44 (11.37)</td>
</tr>
<tr>
<td>BMI</td>
<td>21.11 (4.79)</td>
</tr>
<tr>
<td>Waist Circumference (cm)</td>
<td>68.98 (9.47)</td>
</tr>
</tbody>
</table>

Table 7 reports the proportion of the sample who were classified as overweight or obese according to international BMI cut off points (Cole et al., 2000).

Table 7. Proportion of Sample Classified as Overweight or Obese at Baseline

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion Overweight</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Proportion Obese</td>
<td>7</td>
<td>54</td>
</tr>
<tr>
<td>Proportion Overweight / Obese</td>
<td>8</td>
<td>62</td>
</tr>
</tbody>
</table>
4.2 RESEARCH QUESTIONS

Three research questions were the focus of the study:

- Research Question One
  Will the after-school homework club, physical activity and sport program be feasible?

- Research Question Two
  Will the after-school homework club, physical activity and sport program be acceptable?

- Research Question Three
  Will the after-school homework club, physical activity and sport program be potentially efficacious?

4.3 RESEARCH QUESTION ONE

The first research question examined the feasibility of the Wollongong Sport Program. To determine it’s feasibility three criteria were examined: recruitment, retention, and collection of measurements.

The first criterion was recruitment; the objective was to recruit 12 primary school girls from the one primary school into the Wollongong Sport Program.
Once the selection of the Illawarra primary school was complete, consultations between the school's executive staff, the research supervisor, and facilitators occurred. Discussions focused upon what strategy would be the most appropriate and practical in recruiting the desired number of participants.

For convenience and to limit any disruption to the school it was agreed that the school executive staff would initially identify girls from Year 2 to Year 4 who they believed would benefit most from being involved in the Wollongong Sport Program. As a result of this approach, 13 girls were targeted. The program was then promoted by the school's Principal and the school's Stage Two Coordinator to the prospective girl's parents at a parent teacher evening conducted by the school. A brief letter about the program was given to each parent.

Thirteen girls expressed interest in being involved in the program. Therefore, the approach used for recruiting 12 primary school girls was successful.

The second aspect of this research question considered the retention of participants in the after-school homework club, physical activity, and sport program. The aim was to retain 90% of participants from pre to post-test.

The school principal recommended that the facilitators conduct an orientation week prior to the commencement of the program to enable the 13 girls to trial the program before consenting to participate. The orientation enabled the girls to have an increased understanding about the program and they were able ask the facilitators any
questions without any obligation for continued participation in the *Wollongong Sport Program*.

Two orientation sessions were conducted; 11 (85%) participants attended the first orientation session and 13 (100%) attended the second orientation session. Hence, at the completion of the orientation sessions all 13 girls had experienced and participated in at least one orientation session.

At the completion of the orientation week, information packages containing detailed information about the program were given to parents and to participants. Any questions or concerns from participants, their parents, or school staff were answered by the facilitators.

All 13 participants from the orientation sessions consented to their involvement in the after-school homework club, physical activity, and sport program.

To create a feeling of ‘community’ each participant received two t-shirts with the *Wollongong Sport Program* Logo (Appendix O), a cap, and a drink-bottle. At each session the participants, facilitators, and assistants wore these items of clothing. In addition, during the homework component all participants had access to ‘special’ stationery that the facilitators provided including glitter pens, coloured pencils, and markers.

Participants were also asked by facilitators at the end of each session to list on the session evaluation sheet activities, games or sports they enjoy and would like
considered for inclusion in future sessions. The facilitators and assistants used this feedback and incorporated many of the suggestions into sessions. This was advantageous in providing the participants with some input and ownership of the program.

All (100%) of the participants completed the program. Hence, the objective of retaining 90% of participants was successfully accomplished.

The third component of this research question focused on the collection of data. The goal was to collect all data from each participant at baseline and post-test.

At baseline, testing, 12 participants were in attendance; and all data for the 12 girls were collected and recorded during this first session. The absent participant’s baseline data were collected at the start of the following session, prior to her formally starting the first session.

At base line testing, one participant’s Parent Pediatric Quality of Life (PedsQL) questionnaire was not collected nor was one participant’s weight.

All participants were given a copy of the Parent PedsQL questionnaire in an envelope at the conclusion of the first session. Facilitators communicated with parents as they collected their daughters about the purpose of the report, how to complete it and when it needed to be returned. This information was additionally typed and included in the envelope.
The aim was to have the Parent PedsQL questionnaires returned to the facilitators at the beginning of the subsequent session. Six were returned. Most participants who did not return the questionnaire stated they had simply forgotten to bring the reports to school and were asked by facilitators to return them the following session.

As a follow up, each participant that had not returned the Parent PedsQL, was given another copy. Additionally, the facilitators reminded and asked the parents to complete the report and place it in their daughter’s school bag. At the following session, six of the seven remaining reports were returned.

A facilitator had prepared to speak with the parent of the one missing PedsQL report at the conclusion of the subsequent session when they collected their daughter; however, the participant was absent.

All participants were made aware prior to the collection of any data that it was their decision whether they wanted or did not want any of the measurements collected. Moreover, any measurements that were recorded would remain confidential and only accessible to the facilitators.

One participant expressed concern about her weight being recorded at baseline. Accordingly, the girl opted to not have herself weighed.

At post-test all 13 girls were in attendance, therefore all data for each participant were collected during this final session.
At post-test, one Parent PedsQL questionnaire was not completed. This missing post-test data was from a different participant than the absent Parent PedsQL questionnaire from baseline.

Each girl in the session prior to post-test data collection (session 14) was given an envelope containing a copy of the Parent PedsQL questionnaire. One facilitator explained to the girls that their parents needed to complete the questionnaire and return it at the last session (post-test). The other two facilitators discussed the report with parents.

At post-test 12, out of 13 Parent PedsQL questionnaires were completed with four of the 12 reports completed by parents at the final session. This was made possible as all parents were in attendance to watch their daughter perform the hip-hop dance routine they had learned and practiced during the last four sessions of the program. The parent did not complete the missing report before or during the final session.

The collection of all data at baseline and post-test was largely achieved, with only three assessment items not completed.

In summary, two of the three criterion for establishing whether the after-school homework club, physical activity and sport program was feasible were successfully achieved.
4.4 RESEARCH QUESTION TWO

The second research question investigated the acceptability of the *Wollongong Sport Program*. To establish its acceptability three criteria were established and examined; these were implementation, attendance, and enjoyment.

The first aspect was implementation; with the objective to implement 100% of the intended sessions.

Initially 16 sessions were planned for the *Wollongong Sport Program*, however during the sequencing and planning of activities it was realised that one of the sessions fell on a public holiday and hence a pupil free day at school. As a consequence, the number of sessions was revised to 15.

All 15 of the planned sessions were implemented and completed. The indoor and outdoor facilities of the school site enabled all sessions to be conducted regardless of the weather.

The second component of this research question was attendance; with the aim to have a minimum 80% attendance rate at each session.

The attendance data revealed that 14 out of 15 sessions had an attendance rate above the intended 80%. This information is shown in Table 8.
Table 8. *Session Attendance*

<table>
<thead>
<tr>
<th>'Sport'</th>
<th>Session</th>
<th>Attendance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball/Netball</td>
<td>1 (Post-Test)</td>
<td>92</td>
</tr>
<tr>
<td>Basketball/Netball</td>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>Basketball/Netball</td>
<td>3</td>
<td>85</td>
</tr>
<tr>
<td>Basketball/Netball</td>
<td>4</td>
<td>100</td>
</tr>
<tr>
<td>Basketball/Netball</td>
<td>5</td>
<td>77</td>
</tr>
<tr>
<td>Soccer</td>
<td>6</td>
<td>85</td>
</tr>
<tr>
<td>Soccer</td>
<td>7</td>
<td>100</td>
</tr>
<tr>
<td>Soccer</td>
<td>8</td>
<td>85</td>
</tr>
<tr>
<td>Soccer</td>
<td>9</td>
<td>92</td>
</tr>
<tr>
<td>Soccer</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Hip-Hop Dance</td>
<td>11</td>
<td>100</td>
</tr>
<tr>
<td>Hip-Hop Dance</td>
<td>12</td>
<td>92</td>
</tr>
<tr>
<td>Hip-Hop Dance</td>
<td>13</td>
<td>92</td>
</tr>
<tr>
<td>Hip-Hop Dance</td>
<td>14</td>
<td>92</td>
</tr>
<tr>
<td>Hip-Hop Dance</td>
<td>15 (Pre-Test)</td>
<td>100</td>
</tr>
</tbody>
</table>

Session five was the only session below the desired 80% attendance rate; having a 77% attendance. The rationale for the low attendance rate can be attributed to one participant being absent due to a family holiday interstate, another girl not present due to illness and a third participant whose parent/s had to be phoned prior to the afternoon snack due to sickness.
An analysis of the attendance rates for the entire program revealed that six out of the 15 sessions had a 100% attendance rate. The reasons participants gave for being absent from sessions were predominantly due to illness with other reasons included having to attend medical appointments, being on holidays and problems or concerns with other participants involved in the Wollongong Sport Program.

At the time of the program, the school was having a problem with some of its female students in Year 3 and Year 4. The students were being unpleasant to each other with isolation and name-calling evident in the playground. A few of the participants involved in the program were identified by the school. At times during the Wollongong Sport Program, particular girls (not always the same girls) would ignore and isolate themselves from other participants (not always the same participants). Consequently, this made certain girls feel lonely, upset, and concerned about friendships.

Despite these incidents, the average attendance rate for the entire Wollongong Sport Program was 93%.

In summary, only one session was below the intended 80% attendance rate, however, the reasons for participants’ absence at this session were justifiable and bore no reflection upon the program, its activities, or the facilitators.

The third aspect to this research question was participant enjoyment; with the goal to have participants rate their enjoyment of the sessions a minimum of 3 on a 5 point scale.
The enjoyment scales allowed the participants to provide feedback to the facilitators of the *Wollongong Sport Program* according to how much they enjoyed or did not enjoy individual activities. The girls were able to rate each activity on a scale from really disliked ‘1’, disliked ‘2’, neither liked nor disliked ‘3’, liked a little ‘4’, to really liked ‘5’.

The mean scores from the 15 sessions ranged from 4.1 to 4.8 with the average score for the entire *Wollongong Sport Program* being 4.5. This suggests that, as a whole, the participants ‘liked’ the *Wollongong Sport Program* sessions. Table 9 shows the mean enjoyment score for each session and the overall mean for all *Wollongong Sport Program* sessions.
Table 9. Participant Enjoyment Scores for each Session of the Wollongong Sport Program

<table>
<thead>
<tr>
<th>Session</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
<tr>
<td>2</td>
<td>4.1</td>
<td>1.4</td>
</tr>
<tr>
<td>3</td>
<td>4.4</td>
<td>1.1</td>
</tr>
<tr>
<td>4</td>
<td>4.6</td>
<td>0.7</td>
</tr>
<tr>
<td>5</td>
<td>4.8</td>
<td>0.5</td>
</tr>
<tr>
<td>6</td>
<td>4.2</td>
<td>1.2</td>
</tr>
<tr>
<td>7</td>
<td>4.7</td>
<td>0.7</td>
</tr>
<tr>
<td>8</td>
<td>4.6</td>
<td>0.7</td>
</tr>
<tr>
<td>9</td>
<td>4.5</td>
<td>1.1</td>
</tr>
<tr>
<td>10</td>
<td>4.5</td>
<td>1.1</td>
</tr>
<tr>
<td>11</td>
<td>4.6</td>
<td>1.1</td>
</tr>
<tr>
<td>12</td>
<td>4.6</td>
<td>1.0</td>
</tr>
<tr>
<td>13</td>
<td>4.5</td>
<td>1.1</td>
</tr>
<tr>
<td>14</td>
<td>4.3</td>
<td>1.2</td>
</tr>
<tr>
<td>15</td>
<td>N/A*</td>
<td>N/A*</td>
</tr>
<tr>
<td>Average</td>
<td>4.5</td>
<td>1.0</td>
</tr>
</tbody>
</table>

* No session evaluations were conducted for session 1 (baseline testing) and for session 15 (post-testing) because the majority of time in both sessions was taken up with data collection.
Data from the session evaluations also enabled an assumption to be made about which ‘sport’ the participants favoured, or enjoyed the most. Data revealed that all three ‘sports’: basketball / netball, soccer and hip-hop dance each had a mean score rating for the entire Wollongong Sport Program of 4.5. This suggests that participants did not have a clear preference for one particular sport. Table 10 reports the mean enjoyment scores for each “sport.”

**Table 10. Participant Enjoyment Scores for each ‘Sport’ of the Wollongong Sport Program**

<table>
<thead>
<tr>
<th>‘Sport’</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball / Netball</td>
<td>4.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Soccer</td>
<td>4.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Hip-Hop Dance</td>
<td>4.5</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Additionally, Table 11 details the minimum and maximum scores obtained for each ‘sport’ of the Wollongong Sport Program.
Table 11. Participant Enjoyment Minimum and Maximum Scores for each ‘Sport’ in the Wollongong Sport Program

<table>
<thead>
<tr>
<th>‘Sport’</th>
<th>Minimum</th>
<th>SD</th>
<th>Maximum</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball / Netball</td>
<td>4.1</td>
<td>0.5</td>
<td>4.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Soccer</td>
<td>4.2</td>
<td>0.7</td>
<td>4.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Hip-Hop Dance</td>
<td>4.3</td>
<td>1.0</td>
<td>4.6</td>
<td>1.2</td>
</tr>
</tbody>
</table>

In summary, the participant’s mean enjoyment of the Wollongong Sport Program was 4.5 on a 5-point scale. With none of the session enjoyment ratings falling below a rating of four. Therefore, this accomplished the aim of having participants rate each session a minimum of 3 on a 5-point scale.

4.5 RESEARCH QUESTION THREE

The third research question investigated the potential efficacy of the Wollongong Sport Program. To establish this, three hypotheses were tested. These were that, as a result of participating in the Wollongong Sport Program, participants would demonstrate:

H1: A decrease or stability in BMI z Score (for those overweight or obese) or a stabilisation in BMI (the entire sample including those who were overweight or obese).
H2: An increase in Perceived Competence.
H3: An improvement in Quality of Life.

As this was a proof-of-concept study, it was not adequately powered to detect statistically significant differences.

Primary analysis using all 13 participants’ data was completed; with a secondary analysis done using the data from participants who were classified according to international cut off points as being overweight or obese.

The findings for the entire sample are promising. Results revealed that from baseline to follow up there was a stabilisation and a small decrease in BMI ($P=0.83$). A small increase occurred in waist circumference ($P=0.16$).

The Child Reported Quality of Life, results showed a small improvement in each of the four dimensions: physical functioning ($P=0.79$), emotional functioning ($P=0.56$), social functioning ($P=0.71$) and school functioning ($P=0.26$). Whilst changes were not statistically significant, they do indicate a trend towards enhanced participant quality of life.

The Parent Reported Quality of Life indicated a trend towards improved participant quality of life. Results from pre-test to post-test for each of the four dimensions showed an increase in Quality of Life: physical functioning ($P=0.03$), emotional functioning ($P=0.08$), social functioning ($P=0.23$) and school functioning ($P=0.28$).
Perceived Competence data from baseline to follow up showed a small increase in five of the six domains. This suggests a trend towards an improved perceived competence in these domains. An increase occurred in the physical appearance domain \((P=0.048)\). While the results from the other domains of scholastic competence \((P=0.18)\), social acceptance \((P=0.70)\), athletic competence \((P=0.32)\) and global self worth \((P=0.54)\) were not significant they do indicate a move towards greater perceived competence.

The results for the entire sample for each of the variables are reported in Table 12.
Table 12: **All Participants**: BMI, Waist Circumference, Perceived Competence and Quality of Life at baseline and post-test, and the differences between pre and post-test scores for each domain (means ± standard deviation, t-value and p-value)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline (SD)</th>
<th>9 Week Follow Up (SD)</th>
<th>F/up – B/L Difference</th>
<th>95% CI of diff Lower</th>
<th>95% CI of diff Upper</th>
<th>t Value</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI (kg/m²)</strong></td>
<td>21.11 (4.79)</td>
<td>21.08 (4.54)</td>
<td>-0.03</td>
<td>-0.29</td>
<td>0.36</td>
<td>0.22</td>
<td>0.83</td>
</tr>
<tr>
<td><strong>Waist Circumference (cm)</strong></td>
<td>68.98 (9.47)</td>
<td>70.86 (10.26)</td>
<td>1.88</td>
<td>-4.64</td>
<td>0.88</td>
<td>-1.48</td>
<td>0.16</td>
</tr>
<tr>
<td><strong>Quality of Life (Child)³</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Physical Functioning</td>
<td>4.54 (5.72)</td>
<td>4.38 (5.61)</td>
<td>-0.15</td>
<td>-1.10</td>
<td>1.41</td>
<td>0.27</td>
<td>0.79</td>
</tr>
<tr>
<td>• Emotional Functioning</td>
<td>5.23 (4.71)</td>
<td>4.69 (4.97)</td>
<td>-0.54</td>
<td>-1.43</td>
<td>2.51</td>
<td>0.60</td>
<td>0.56</td>
</tr>
<tr>
<td>• Social Functioning</td>
<td>4.31 (3.82)</td>
<td>4.08 (4.17)</td>
<td>-0.23</td>
<td>-1.10</td>
<td>1.56</td>
<td>0.38</td>
<td>0.71</td>
</tr>
<tr>
<td>• School Functioning</td>
<td>4.92 (4.44)</td>
<td>3.46 (3.78)</td>
<td>-1.46</td>
<td>-1.25</td>
<td>4.17</td>
<td>1.18</td>
<td>0.26</td>
</tr>
<tr>
<td><strong>Quality of Life (Parent)³</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Physical Functioning</td>
<td>5.17 (6.01)</td>
<td>3.15 (4.72)</td>
<td>-2.01</td>
<td>0.23</td>
<td>3.79</td>
<td>2.47</td>
<td>0.03</td>
</tr>
<tr>
<td>• Emotional Functioning</td>
<td>4.75 (3.24)</td>
<td>2.46 (2.18)</td>
<td>-2.29</td>
<td>-0.27</td>
<td>4.84</td>
<td>1.95</td>
<td>0.08</td>
</tr>
<tr>
<td>• Social Functioning</td>
<td>3.58 (3.43)</td>
<td>2.38 (2.76)</td>
<td>-1.20</td>
<td>-0.87</td>
<td>3.27</td>
<td>1.26</td>
<td>0.23</td>
</tr>
<tr>
<td>• School Functioning</td>
<td>3.67 (3.25)</td>
<td>2.54 (2.96)</td>
<td>-1.13</td>
<td>-1.04</td>
<td>3.29</td>
<td>1.14</td>
<td>0.28</td>
</tr>
<tr>
<td><strong>Perceived Competence</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Scholastic Competence</td>
<td>18.85 (5.41)</td>
<td>19.69 (4.73)</td>
<td>0.85</td>
<td>-2.12</td>
<td>0.43</td>
<td>1.44</td>
<td>0.18</td>
</tr>
<tr>
<td>• Social Acceptance</td>
<td>16.15 (5.15)</td>
<td>16.85 (3.93)</td>
<td>0.69</td>
<td>-4.46</td>
<td>3.08</td>
<td>0.40</td>
<td>0.70</td>
</tr>
<tr>
<td>• Athletic Competence</td>
<td>18.92 (5.77)</td>
<td>20.23 (4.66)</td>
<td>1.31</td>
<td>-4.03</td>
<td>1.41</td>
<td>1.05</td>
<td>0.32</td>
</tr>
<tr>
<td>• Physical Appearance</td>
<td>18.69 (4.35)</td>
<td>20.77 (3.56)</td>
<td>2.08</td>
<td>-4.13</td>
<td>-0.02</td>
<td>2.20</td>
<td>0.048</td>
</tr>
<tr>
<td>• Behavioural Conduct</td>
<td>21.15 (3.46)</td>
<td>21.00 (3.03)</td>
<td>-0.15</td>
<td>-1.28</td>
<td>1.59</td>
<td>0.23</td>
<td>0.82</td>
</tr>
<tr>
<td>• Global Self Worth</td>
<td>20.85 (3.48)</td>
<td>21.38 (2.99)</td>
<td>0.54</td>
<td>-2.41</td>
<td>1.33</td>
<td>0.63</td>
<td>0.54</td>
</tr>
</tbody>
</table>

³ Note: a lower score is Quality of Life indicates a higher Quality of Life.
The results for the overweight and obese girls are highly promising, particularly given the small sample size.

Results revealed that from baseline to follow up there had been a small decrease in BMI \( z \) Score \((P=0.10)\) and waist circumference \((P=0.49)\).

The Child Reported Quality of Life, results showed a small improvement in each of the four dimensions: physical functioning \((P=0.13)\), emotional functioning \((P=0.07)\), social functioning \((P=0.65)\) and school functioning \((P=0.28)\). Whilst changes were not statistically significant, they did indicate a trend towards enhanced participant quality of life.

The Parent Reported Quality of Life results indicated a trend towards improved participant quality of life. Results from pre-test to post-test in three of the four dimensions showed a reduction: physical functioning \((P=0.07)\), emotional functioning \((P=0.32)\), and school functioning \((P=0.79)\). The fourth dimension social functioning remained the same from baseline to follow up \((P=1.00)\).

The participants' Perceived Competence data from baseline to follow up show a small increase in five of the six domains. This suggests a trend towards an improved perceived competence in these domains. A statistically significant increase occurred in the domains of scholastic competence \((P=0.049)\) and physical appearance \((P=0.04)\). While the results from the other domains of social acceptance \((P=0.40)\), athletic competence \((P=0.25)\) and global self worth \((P=0.32)\) were not significant they
do indicate a move towards greater perceived competence. A slight decrease occurred in the behavioural conduct domain ($P=0.76$).

The results for the overweight and obese sample for each of the variables are reported in Table 13.
Table 13: **Overweight and Obese Participants**: BMI z score, Waist Circumference, Perceived Competence and Quality of Life at baseline and post-test, and the differences between pre and post-test scores for each domain (means ± standard deviation, t-value and p-value)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline (SD)</th>
<th>9 Week Follow Up (SD)</th>
<th>F/up – B/L Difference</th>
<th>95% CI of diff</th>
<th>t Value</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Upper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI z Score</td>
<td>2.33 (6.25)</td>
<td>2.23 (6.94)</td>
<td>-0.10</td>
<td>-0.26</td>
<td>0.23</td>
<td>1.87</td>
</tr>
<tr>
<td>Waist Circumference (cm)</td>
<td>77.66 (4.24)</td>
<td>77.04 (7.26)</td>
<td>-1.39</td>
<td>-5.85</td>
<td>3.08</td>
<td>-0.74</td>
</tr>
<tr>
<td>Quality of Life (Child) a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Functioning</td>
<td>4.00 (5.01)</td>
<td>3.13 (5.14)</td>
<td>-0.88</td>
<td>-0.34</td>
<td>2.09</td>
<td>1.70</td>
</tr>
<tr>
<td>Emotional Functioning</td>
<td>4.75 (4.06)</td>
<td>3.00 (3.21)</td>
<td>-1.75</td>
<td>-0.19</td>
<td>3.69</td>
<td>2.14</td>
</tr>
<tr>
<td>Social Functioning</td>
<td>3.63 (2.97)</td>
<td>3.25 (3.96)</td>
<td>-0.38</td>
<td>-1.52</td>
<td>2.27</td>
<td>0.47</td>
</tr>
<tr>
<td>School Functioning</td>
<td>4.00 (4.18)</td>
<td>2.63 (3.42)</td>
<td>-1.38</td>
<td>-1.38</td>
<td>4.13</td>
<td>1.81</td>
</tr>
<tr>
<td>Quality of Life (Parent) a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Functioning</td>
<td>5.50 (7.75)</td>
<td>3.63 (5.73)</td>
<td>-1.88</td>
<td>-0.19</td>
<td>3.94</td>
<td>2.14</td>
</tr>
<tr>
<td>Emotional Functioning</td>
<td>3.75 (2.87)</td>
<td>2.63 (2.26)</td>
<td>-1.13</td>
<td>-1.34</td>
<td>3.59</td>
<td>1.08</td>
</tr>
<tr>
<td>Social Functioning</td>
<td>3.38 (3.66)</td>
<td>3.38 (3.02)</td>
<td>0.00</td>
<td>-2.14</td>
<td>2.14</td>
<td>0.00</td>
</tr>
<tr>
<td>School Functioning</td>
<td>2.50 (3.46)</td>
<td>2.25 (3.06)</td>
<td>-0.25</td>
<td>-1.93</td>
<td>2.43</td>
<td>0.27</td>
</tr>
<tr>
<td>Perceived Competence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scholastic Competence</td>
<td>18.63 (4.93)</td>
<td>19.88 (4.05)</td>
<td>1.25</td>
<td>-2.49</td>
<td>-0.01</td>
<td>-2.38</td>
</tr>
<tr>
<td>Social Acceptance</td>
<td>16.75 (5.33)</td>
<td>18.75 (3.11)</td>
<td>2.00</td>
<td>-7.31</td>
<td>3.31</td>
<td>-0.89</td>
</tr>
<tr>
<td>Athletic Competence</td>
<td>18.38 (5.34)</td>
<td>20.38 (5.15)</td>
<td>2.00</td>
<td>-5.79</td>
<td>1.79</td>
<td>-1.25</td>
</tr>
<tr>
<td>Physical Appearance</td>
<td>17.00 (4.69)</td>
<td>20.13 (3.68)</td>
<td>3.13</td>
<td>-6.10</td>
<td>-0.15</td>
<td>-2.48</td>
</tr>
<tr>
<td>Behavioural Conduct</td>
<td>21.50 (3.46)</td>
<td>21.25 (2.71)</td>
<td>-0.25</td>
<td>-1.63</td>
<td>2.13</td>
<td>0.31</td>
</tr>
<tr>
<td>Global Self Worth</td>
<td>20.38 (3.58)</td>
<td>21.75 (2.87)</td>
<td>1.38</td>
<td>-4.44</td>
<td>1.69</td>
<td>-1.06</td>
</tr>
</tbody>
</table>

*Note a lower score in Quality of Life indicates a Higher Quality of Life*
While this study was not adequately powered to detect statistically significant differences, it did produce results that were highly promising in establishing the potential efficacy of such a program for primary school girls in relation to the measures of BMI, BMI \( z \) Score, Perceived Competence and Quality of Life.

4.6 SUMMARY

This study aimed to determine the feasibility, acceptability and potential efficacy of an after-school homework club, physical activity and sport program for primary school girls. Data were collected from 13 primary school girls from one Illawarra primary school and were examined in order to investigate three research questions. The results obtained from the data are summarised in Table 14, Table 15, Table 16, and Table 17.

Table 14. A Summary of Results in Relation to Research Question 1

<table>
<thead>
<tr>
<th>Research Question 1</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will the after-school homework club, physical activity and sport program be feasible?</td>
<td>• Recruitment: school executive identified 13 potential participants.</td>
</tr>
<tr>
<td></td>
<td>• Retention: all 13 recruited participants completed the entire program.</td>
</tr>
<tr>
<td></td>
<td>• Collection of Measurements: the majority of data were collected pre and post intervention.</td>
</tr>
</tbody>
</table>
Table 15. *A Summary of Results in Relation to Research Question 2*

<table>
<thead>
<tr>
<th>Research Question 2</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will the after-school homework club, physical activity and sport program be acceptable?</td>
<td>• Implementation: all 15 planned sessions and two orientation sessions conducted.</td>
</tr>
<tr>
<td></td>
<td>• Attendance: average attendance rate of 93% at each session achieved.</td>
</tr>
<tr>
<td></td>
<td>• Enjoyment: average enjoyment scale rating of 4.5 for each session achieved.</td>
</tr>
</tbody>
</table>
Table 16. *A Summary of Results in Relation to Primary Research*

**Question 3 for all Participants**

<table>
<thead>
<tr>
<th>Research Question 3</th>
<th>Results</th>
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<tr>
<td>Will the after-school homework club, physical activity and sport program be potentially efficacious?</td>
<td>• BMI: small reduction achieved.</td>
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<td></td>
<td>• Waist Circumference: a slight increase achieved.</td>
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<td></td>
<td>• Quality of Life (Child Reported): a small decrease in all four dimensions indicating a trend towards improved quality of life.</td>
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<td></td>
<td>• Quality of Life (Parent Reported): a small reduction in all four dimensions, with physical functioning being of statistical significance ($P=0.03$).</td>
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<td></td>
<td>• Perceived Competence: a slight increase in 5 out of 6 domains, with physical appearance ($P=0.048$) being of statistical significance. A slight decrease occurred in the behavioural conduct domain.</td>
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Table 17. *A Summary of Results in Relation to Primary Research Question 3 for Participants who were Overweight or Obese.*

<table>
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| Will the after-school homework club, physical activity and sport program be *potentially efficacious?* | - BMI z Score: small reduction achieved.  
- Waist Circumference: a slight decrease achieved.  
- Quality of Life (Child Reported): a small decrease in all four dimensions indicating a trend towards improved quality of life.  
- Quality of Life (Parent Reported): a small reduction in three out of the four dimensions, with social functioning remaining the same pre-test to post-test.  
- Perceived Competence: a slight increase in 5 out of 6 domains, with scholastic competence (*P*=0.049) and physical appearance (*P*=0.04) being of statistical significance. A slight decrease occurred in the behavioural conduct domain. |
CHAPTER V: SUMMARY, DISCUSSION, RECOMMENDATIONS AND CONCLUSIONS

The outcomes of this study provide results concerning the feasibility, acceptability, and potential efficacy of the Wollongong Sport Program after-school homework club, physical activity, and sport program for primary school girls.

5.1 SUMMARY

To determine the feasibility, acceptability and potential efficacy of an after-school homework club, physical activity, and sport program for primary school girls a variety of data were collected. Information was collected about the implementation of the Wollongong Sport Program; related to participant recruitment, retainment and attendance and the participant rated enjoyment of sessions. Additional information was gathered concerning the effect of the program on the perceived competence, quality of life, and anthropometry changes of the participants.

The results from this study are useful for the future development of the Wollongong Sport Program as well as prospective after-school programs that have the similar objectives of stabilising or reducing BMI in overweight and obese girls, improving primary school girls' quality of life, perceived competence as well as their enjoyment and increased involvement in physical activity in an after-school setting.
5.2 DISCUSSION

This study was focused around three research questions. The results obtained support the aims and hypotheses and these will be examined in detail.

The first research question focused on whether the Wollongong Sport Program after-school homework club, physical activity, and sport program was feasible. To determine this, three goals were set:

1. Can 12 primary school girls be recruited?
2. Could 90% of participants be retained pre-test to post-test?
3. Can all pre-test and post-test measurements be successfully collected?

The first goal, that 12 primary school girls be recruited to the Wollongong Sport Program was achieved. The successful recruitment of 13 girls was a result of the school executive particularly the school Principal and Stage Two Coordinator identifying female students in Year 2, 3 and 4 who they believed would benefit most from being involved in the Wollongong Sport Program and then promoting it to the prospective participants' parents at a school parent teacher evening.

This recruitment approach was effective. This may have been associated with the school executive already knowing the majority of parents. These relationships may have created initial responsiveness to the program because of the school's recommendations. Furthermore this method of recruitment enabled prospective participants to be identified and approached discreetly, rather than having to express interest in the program via school newsletter advertisements which may have singled
out and labeled possible participants. Additionally the involvement of school staff with the research team enabled connections to be established between the school and the university, which may aid in the continued future development of the *Wollongong Sport Program*.

Furthermore, the *Wollongong Sport Program* may have appealed to parents because there were no costs involved and no transportation was required. This is unlike other after-school sporting activities that do require substantial financial outlay and transportation.

The second goal, that 90% of participants would be retained from baseline to follow up, was also achieved with a 100% retention rate. This was a very positive result considering the high attrition rates shown in other interventions designed to treat and prevent childhood obesity (Summerbell et al., 2003). The CATCH Kids Club Program (Kelder et al., 2004) for example had a participant drop out rate of 39%. The use of focus groups in this study enabled information to be gathered from participants and suggested that this high attrition rate may have been partially attributable to children being less likely to enjoy participating in after-school programs that contain educational components.

Similar to the *Wollongong Sport Program* the Stanford SPORT Study (Weintraub et al., in press) had a 100% participant retention rate and the Stanford GEMS study (Robinson et al., 2003) had a high participant retention from baseline to follow up, with only a 1.6% loss of participants. The suggested reasons for these successes were the formative research and piloting processes implemented in the districts where
participants were recruited. This ensured that the researchers had a greater understanding of the participants and their families and had insights into what factors would encourage and motivate participation.

Likewise the retention rate of the *Wollongong Sport Program* may in part have been associated with the two orientation sessions conducted prior to the commencement of the actual program. The 13 participants were able to attend the orientation sessions to experience for themselves what the after-school program would be like and the types of activities they would be involved in, without any continued obligation. The sessions also provided the research team and facilitators with an awareness of the participant's interests and needs which were considered and included in the planning phase for the intended sessions.

Another possible reason for the 100% retention rate of participants was the sense of belonging and team that was created and developed amongst the girls. This was achieved through the allocation of *Wollongong Sport Program* team t-shirts, hats and drink bottles and the use of team challenge activities. For example, throughout the five dance sessions the participants were involved in learning a dance routine, with each girl having a special role in the performance which created collegial support and teamwork. This therefore created the belief among participants that they were valued and important and that they had a special responsibility not only in the performance but to the group. This was particularly important given that many overweight children avoid participation in physical activity to evade teasing and victimization about their weight from peers (Storch et al., 2006).
Furthermore, the retention of all participants is likely to have occurred because the program specifically focused on girls and was conducted in an all female environment. The participants were vocal in their support of not including boys in the program particularly as they were able to be the focus and were able to participate without being dominated by their male peers. The Project Destiny Program (Kyles & Lounsbery, 2004) was also conducted using an all girl group and similar to the Wollongong Sport Program, participants were able to be themselves where they were not fearful or intimidated at becoming involved in physical activity and there was the removal of any pressures which they may feel when participating with skilled peers, particularly boys.

The third goal, that all pre-test and post-test measurements would be successfully collected was achieved with the exception of three assessments. At the conclusion of the orientation sessions information packages containing detailed information were given to parents and participants. This included information related to what data would be collected at baseline and follow up and the requirements of participants and parents.

At the beginning of pre and post-testing participants were reminded that they were under no obligation to complete any of the measurements. At baseline one participant expressed concern about her weight being recorded, accordingly the girl opted to not have herself weighed. However at follow up she felt comfortable to be weighed and her was weight recorded.
At the conclusion of the first session and at the end of session 14, participants were each given an envelope containing a copy of the Parent PedsQL (Varni, 1998) questionnaire as well as completion and returning date instructions, to give to their parent/s. Additionally when parents collected their daughters, facilitators aimed to speak with each of them about the importance and relevance of these questionnaires.

At baseline, only six Parent PedsQL questionnaires were returned as requested, with follow up conversations and repeat questionnaires were given to those who had failed to return them, resulting in 12 of the 13 being returned. The predominant reasons given by participants for not returning them as requested were they had forgotten to give the envelope to their parents or had forgotten to pack the completed questionnaire in their school bags. Likewise, this forgetfulness occurred at follow up. However, 12 of the 13 questionnaires were able to be completed but this can be attributable to many questionnaires being completed by parents during their attendance at the final session, where they watched their daughter perform their dance routine.

Requesting parents to complete the questionnaire during the dance performance proved to be a more efficient approach in collecting this data as it removed the need for the girls to be involved in this process. Additionally it was feasible to ask parents to complete the questionnaire at the last session because it required only a few minutes of their time and also it did not allow any discussion to occur between parent and daughter until the completion of the session.
The selection of the PedsQL Pediatric Quality of Life Inventory Child Report aged for children eight to 12 years of age (Varni, 1998) and the Self-Perception Profile for Children (Harter, 1985) may have been a factor in the successful collection of all psychological measurements. This is because these assessment tools were selected for their age appropriateness for the participants in the Wollongong Sport Program hence, the girls were able to comprehend what was being asked of them.

Additionally, prior to the completion of each questionnaire the facilitator verbally and visually (on a white board) demonstrated to the participants how to correctly complete the questions. The girl’s were given as much time as they needed to complete the two questionnaires and could ask the facilitator for further clarification if required. This limited the pressure of participants and allowed them to answer the questionnaires.

The routines and allocations of time established from the outset of the program ensured the collection of process data at pre-test and post-test was supported. At the commencement of each session, an attendance record was collected and the final five minutes of each session were set aside for participants to complete a session evaluation. This structure was an efficient and quick method of collecting this data because all participants were familiar with what was going to happen and what they were required to do.

The second research question focused on whether the Wollongong Sport Program after-school homework club, physical activity and sport program was acceptable. To determine this, three goals were set:
1. Can 100% of all intended sessions be implemented?

2. Can a minimum 80% attendance rate at each session be achieved?

3. That participants would rate their enjoyment of the sessions a minimum of three on a five-point scale.

The first goal, that 100% of the intended sessions would be implemented was also achieved. All 15 sessions were completed this was attributable to two central reasons, school facilities and hiring of assistants.

The school site upon which the study was conducted had extensive outdoor and indoor facilities. This meant that regardless of the weather, particularly possible precipitation, and cool temperatures due to the program being held during the winter months, all sessions were able to be fully implemented.

The CATCH Kids Club program (Kelder et al., 2004), had a staff turnover of 35% due to the numerous demands and commitments required to conduct that program. In comparison, the Wollongong Sport Program facilitators remained dedicated. This may have in part been due to sessions being conducted only two afternoons per week and for a period of only nine weeks as well as the number of assistants employed.

Three assistants were involved with the Wollongong Sport Program. They each attended only the five sessions that focused on their 'sport' of expertise, which minimized the time commitment they needed to make, to only 10 hours. The Fit Kid Project (Yin et al., 2005) coordinators ensured its instructors remained interested in its project and subsequently facilitated each session by requiring only two instructors to
be in attendance per session and similarly this reduced the time commitment of the instructors and assistants.

The goal that a minimum 80% attendance rate for each session be achieved was supported in 14 of the 15 sessions, however the reasons for participant’s absences at the one session below 80% were justifiable and had no reflection upon the program, its activities or the facilitators. The average overall attendance rate for the Wollongong Sport Program was 93%.

The Georgia FitKid Project (Yin et al., 2005) was conducted five afternoons per week for eight months and had a mean attendance rating of 49% which equated to 2.5 days per week. This suggests that maybe the length of the Wollongong Sport Program had an impact in maintaining such a high attendance rate because the overall commitment was not lengthy and since the program was only two afternoons per week it enabled the girls to partake in other out of school activities on the remaining three afternoons thus maintaining their interest in the program.

During the middle weeks of the Wollongong Sport Program, the school had problems with many of its female students in Year 3 and Year 4. They were being unpleasant to each other in the playground particularly in the forms of isolation and name calling, with four of the girls in the program were involved in this school problem. At times during the Wollongong Sport Program, particular girls and not always the same girls, would ignore and isolate themselves from other participants (not always the same participants). Consequently, this made the girls feel lonely, upset, and concerned about friendships and this may have influenced attendance. Therefore sessions were
modified to include team building and team challenge activities that encouraged all 13 participants to work together to achieve certain goals. This appeared to make a difference in the girl’s behaviour and willingness to attend and be involved in the remaining sessions.

In addition, the high attendance rate at each session is likely to have been partly attributable to the facilitation of the program occurring on the school site. This is because it eliminated the need for parents’ to have to transport their daughters to another venue. This finding was shown in the Stanford GEMS study (Robinson et al., 2003) where participant’s attendance twice per week was 70% when transportation was provided to the venue in comparison to only a 30% attendance rate when there was no transportation.

The third goal, that sessions would be rated a minimum of three on a five point scale was also met. The mean enjoyment of the *Wollongong Sport Program* was 4.5 on a 5 point scale, with no sessions rated below four.

The physical activity and sport component of the program consisted of three focus ‘sports,’ (basketball / netball, soccer and hip-hop dance) and each sport was allocated five sessions. The sessions were designed to promote and encourage positive social interaction among the participants and facilitators in union with providing each girl with encouraging and constructive feedback and opportunities to be successful.

This design format utilised a mastery motivational environment. Weiss (2000) describes this environment as being where there is a key focus on the promotion of
learning, effort and self improvement, mistakes are considered elements of the learning process and improvements are recognized, praised and highlighted. With an emphasis on cooperative learning which is achieved through the use of diverse participant groupings, where no comparisons are made between participants and opportunities exist for the development of positive friendships and the creation of peer acceptance. This environment enables children to internalise information and competences which positively impact upon their self-esteem, motivation and overall enjoyment of physical activity (Weiss, 2000).

In addition, the Wollongong Sport Program was designed to concentrate on numerous quick games and activities rather than a focus upon correct technique and skill development. This ‘change of pace approach’ is recommended by Weiss (1991) as being effective in creating physical activity that is fun and enjoyable for children.

Another plausible reason for the high enjoyment rating for the Wollongong Sport Program was the challenging yet achievable environment that was established. It was important that participants were able to successfully complete tasks; and this was accomplished by appropriately matching the difficulty level of activities with the capabilities of the participants (Weiss, 2000). When the participants completed a task, it provided them with a great sense of accomplishment and greater competence.

Furthermore, the sports chosen for the Wollongong Sport Program were selected because they are popular within the Illawarra, within the primary school and with girls, they were familiar to both the facilitators and assistants, and they were practical to implement. Similar approaches were evident in the methodologies of the Project
Destiny Program (Kyles & Lounsbery, 2004) and GEMS Stanford Study (Robinson et al., 2003). For example, the GEMS project selected dance as its prominent physical activity because of the social, cultural, and historical importance of dance to the African American community the targeted demographic of its study. The enjoyment results from the GEMS study showed that hip-hop and African dance classes were both rated 1.5 on a 4-point scale where 1 represented "very fun". This suggests that the enjoyment of sessions can be associated to the physical activities selected particularly if they are relevant to participants.

Further, the three sports included in the Wollongong Sport Program can be considered traditional although they were not conducted in the usual manner. Instead, the elements of each were incorporated into various faster paced games and activities. Livingstone, McCaffrey and Rennie (2006) suggested that use of faster paced games is effective for engagement and continued participation. Additionally being an all girl program meant that the activities selected were chosen just for them which helped create feelings of importance and special-ness. Therefore, the participants were continually involved and having fun and this may have been reflected in their high enjoyment ranking.

Engagement and hence enjoyment was also gained in both the Wollongong Sport Program and the Stanford GEMS Program (Robinson et al., 2003) by allowing participants a voice. At the completion of each session the girls could suggest activities, games and music they would like the Wollongong Sport Program facilitators to consider for possible inclusion in future sessions. This provision of
input and responsibility is said to be an important factor in creating an enjoyable physical activity environment (Weiss, 2000).

Like the Stanford GEMS study (Robinson et al., 2003) and the Project Destiny Program (Kyles and Lounsbery, 2004) the Wollongong Sport Program had only female facilitators and assistants who became role models for participants. The enjoyment of the program may have been partly attributable to the facilitators and assistants who were enthusiastic and they too got involved and participated in each activity. The Wollongong Sport Program girls became more engaged and had more fun as evidenced by their laughing, screaming and overall level of involvement when activities were designed to challenge them to outdo the facilitators.

The third research question focused on whether the Wollongong Sport Program after-school homework club, physical activity and sport program was potentially efficacious. To establish this, three hypotheses were tested. These were that, as a result of participating in the Wollongong Sport Program, participants would demonstrate:

H1: A decrease or stability in BMI z Score (for those overweight or obese) or a stabilisation in BMI (the entire sample including those who were overweight or obese)

H2: An increase in Perceived Competence (self-worth).

H3: An improvement in the Quality of Life.
The first hypothesis was accepted. The results showed that the girls who were overweight or obese had a reduced BMI z Score of -0.10 units ($P=0.10$) from pre-test to post-test. This finding is comparable with the results of the Stanford Sport Program (Weintraub et al., in press) which showed a reduction of -0.07 units among overweight and obese participants over a 3 month period.

Among all participants (including non-overweight girls) there was a small, non significant reduction in BMI from pre to post intervention (-0.03 units, $P=0.83$) which indicated a stabilisation in BMI. This compares favorably with the only other known after-school study among primary school girls. In the Stanford GEMS study (Robinson et al., 2003) there was a small, non significant increase in BMI of 0.05 units from baseline to three month follow-up.

The predominant reason for this stabilisation and small reduction in unhealthy weight gain is likely to be due to their increased participation in physical activity. In their review of physical activity interventions in the treatment and prevention of child obesity, Epstein and Goldfield (1999) showed that participation in physical activity significantly reduced a child's adiposity. The results (not part of this thesis) from the Wollongong Sport Program showed that from baseline to follow up the girls had a significant increase in their cardio-respiratory fitness ($P=0.005$), a decrease of three beats per minute in their resting heart rate and an overall increase of 44 minutes per day of participation in objectively measured moderate to vigorous physical activity (Kars, 2007; Maessen, 2007).
Even though the focus was on targeting participation in physical activity, indirectly the girls' small screen viewing and diet may have been impacted upon. The program was conducted during the after-school hours of 3:15 to 5pm hence eliminating the option to watch television or snack on energy dense foods. For example, a study by Davison, Marshall, and Birch (2006) showed that girls who watched more than two hours of television were 4.7 times more likely to be overweight or obese during the ages of 7 to 11 than girls who did not.

The second hypothesis that there would be an increase in the participants' Perceived Competence was also achieved. The results from the program showed the entire sample improved their perceived competence in the following domains: scholastic competence (0.84 units, $P=0.18$), social acceptance (0.70 units, $P=0.70$), athletic competence (1.31 units, $P=0.32$) and especially in the physical appearance domain (2.08 units, $P=0.048$) and global self worth (0.53 units, $P=0.54$).

It is difficult to compare the improvements in the girls' perceived competence due to different measures being implemented in other studies. For the purposes of enabling comparisons, this study will focus on the domains of global self worth and physical appearance, where comparisons can be made.

The results from the Wollongong Sport Program showed that for the entire sample of participants there was a 3% increase in global self-esteem over the nine-week program. This finding is comparable to the results shown in the Stanford GEMS Intervention (Robinson et al., 2003) where participants had a 6% improvement over the three month program. Analyses for just the overweight or obese Wollongong
Sport Program participants showed a greater improvement in their global self-worth of 7% and this result is similar to the Stanford Sport Program (Weintraub et al., in press) participants all of whom were overweight or obese and who had a 12% improvement in self-esteem.

The positive trend towards an improvement in perceived competence amongst the Wollongong Sport Program participants is attributable to various factors.

The first being the Wollongong Sport Program enabled all 13 participants the opportunity to partake in physical activity that was conducted in a safe and fun environment where success was experienced. This was achieved by selecting and implementing activities into sessions that were tailored to the specific needs and interests of the girls. Raustorp, Mattsson, Svensson and Stahle (2006) suggested that participation in physical activity is an important means of increasing and maintaining children's physical self-esteem. This greater level of perceived competence amongst the participants was evident in one school staff member's report to facilitators that all of the girls were active participants at this year's school athletics carnival, they entered every race when in previous years many had not. This indicated that the Wollongong Sport Program participants felt more confident and competent to partake in physical activity. This is particularly important given that many overweight children avoid physical activity for fear of weight-related stigmatisation and weight-based teasing has a negative correlation with self-esteem in school-aged children (Storch et al., 2006).

Additionally the Wollongong Sport Program was focused on creating a sense of belonging among the girls; and this is likely to have improved the girls' global self
worth. This is because throughout the nine weeks they had to work together, support and encourage each other to complete set tasks and challenges. This ensured that participants were able to build and form supportive and positive relationships with each other. This is crucial given that overweight children are often perceived by peers as being an unfavorable playmate and overweight girls are significantly less likely than girls of average weight to be considered attractive (Penny & Haddock, 2006).

Furthermore the fact the Wollongong Sport Program was entirely for girls, assisted in the development of the positive networks that developed between the girls. Kyles and Lounsbery (2004) suggest that all girl programs have great potential in improving the self-esteem and self-confidence in girls because these programs enable the participants to focus on themselves and their physical health. To ensure the Wollongong Sport Program participants felt important, the entire program was designed specifically for them. Of great benefit to the girls was the absence of male peers. This encouraged all girls to become involved and active as they were not being dominated by the boys whom they commented commonly control and dictate school sport.

In addition, at each Wollongong Sport Program session there was a ratio of approximately one facilitator or assistant to every three participants. Consequently this meant that all girls received considerable individual attention, assistance and encouragement in the completion of their homework and their participation in the physical activities. This ratio also ensured that relationships formed between the facilitators and participants, enabling the facilitators to have an awareness of the areas each individual needed assistance with as well as knowledge about what each
participant enjoyed or was interested in. Although not realistic in terms of human personnel the aim was to determine the potential efficacy (can it work under ideal conditions) rather than generalisation and sustainability which can be examined in subsequent studies. The utilisation of this information allowed facilitators to identify strategies they could employ to build greater self-confidence and competence in each participant, hence acting as role models and leaders for the girls (Flansburg, 1993).

More specifically the results from the Wollongong Sport Program showed that the overweight and obese participants had an 18% improvement from pre-test to post-test in the domain of perceived physical appearance. While not using the same measure, the Stanford Sport Study (Weintraub et al., in press) found no change in the measure of over-concerns with weight in its overweight and obese participants.

One plausible reason for the improvement in physical appearance among the overweight and obese participants in the Wollongong Sport Program was the decrease in their BMI z Score (-0.10 units, $P=0.10$). Hills and Byrne (2000 cited in Chia and Wang, 2003) suggest that overweight and obese girls have much lower physical self-esteem than girls of normal weight. Hence, if the participants felt as though they were losing weight and becoming healthier whilst being involved in the Wollongong Sport Program this may have made them feel more positive about their physical appearance.

Furthermore being involved in an all girl program, where all participants were similar to each other in various ways including age, school year, weight, academic and sporting ability may have made participants feel a greater sense of normality. The
allocation of a *Wollongong Sport Program* ‘uniform’ to all participants and facilitators was important in making each girl feel equal and special.

It is possible however that the *Wollongong Sport Program* participants did compare themselves to their peers when completing the post-test perceptions of physical appearance. At baseline the girls may have compared themselves to healthy weighted peers from their class or who they have seen in the media or community, therefore they perceived themselves as having a poorer physical appearance. But, after participating in the program for nine weeks, with girls who had similar bodies, the participants may have become less critical of their own physical appearance and compared themselves against the other participants in the program, indicating that programs designed for girls of similar ages and body types may positively impact upon their perceived physical appearance competence.

The girl’s improved athletic competence (Kars, 2007) is likely to be a result of their participation in the physical activity component of the *Wollongong Sport Program*. The sessions were designed so all participants could be actively involved and experience success. The activities and games included were relevant to the girls; they were fun, engaging, challenging and motivating, there was no emphasis on correct technique and skill development but rather an enjoyment of being physically active. Furthermore the program was facilitated in a safe and supportive environment which encouraged positive social interaction and team work as well as facilitators providing every participant with individual encouragement and constructive feedback. Hence the sessions helped to establish a belief among all participants that physical activity is enjoyable and is something they can successfully do.
Furthermore the *Wollongong Sport Program* contained a homework component whereby participants brought their class allocated homework and would work on completing it with the assistance of facilitators and the other girls in the program. This may have impacted upon and influenced the improvements in the scholastic competence of participants. Importantly facilitators were able to help each participant individually and in small groups. This allowed greater attention, support and time to be given to the explanation and demonstration of how to complete a task or answer a question. This personalised instruction is generally impractical for classroom teachers given the number of students they are responsible for and parents who are often busy working and or completing numerous tasks during the after-school period. Therefore the *Wollongong Sport Program* may have assisted in developing the participant’s academic abilities. In support of this is Yin et al (2005) who suggests that by providing assistance with participant’s academic needs programs are able to benefit both the health and school needs of children.

The third hypothesis, that a trend towards improved Quality of Life as reported by the participants and their parents was also achieved. The results showed that small improvements in each of the four dimensions: physical functioning (*P*=0.79), emotional functioning (*P*=0.56), social functioning (*P*=0.71) and school functioning (*P*=0.26) were reported by the participants. Parents reported improved participant quality of life in all four dimensions: physical functioning (*P*=0.03), emotional functioning (*P*=0.08), social functioning (*P*=0.23) and school functioning (*P*=0.28).

The results gained from the *Wollongong Sport Program* are not comparable to other after-school based interventions or programs designed to prevent or treat overweight
or obesity in children. This is because as yet no known studies have been completed or published containing Quality of Life findings.

However, a study by McCallum et al. (2007) conducted in an Australian primary health care setting did include quality of life measurements. The intervention aimed to reduce overweight or mildly obese children’s BMI through visitations to their general practitioner in combination with nutrition, sedentary behaviours, and physical activity behaviour changes through the use of purposefully designed family manuals, over a 12-week period. The results showed from baseline to follow up (nine months) the parent-reported quality of life had declined by -3.9 units, however the participant reported results were not published. In contrast, the parent-reported quality of life results from the Wollongong Sport Program had improvements in all four dimensions.

The improved Quality of Life results as reported by parents are likely due to the possible changes in behaviours, attitudes and actions their daughters may have demonstrated over the nine-week period. This is in combination with the feedback they may have received about the Wollongong Sport Program and their daughter’s performance from other parents, school staff, the facilitators or daughters themselves.

The probable explanations for the trend in an improved Quality of Life as reported by participants would be for the similar reasons as outlined for improvements in Perceived Competence.

Williams et al. (2005) for example recommends a child’s quality of life declines as soon as their weight is above the healthy weight range for their age, and this decline in
quality of life worsens as BMI increases. Hence the improved trend in Quality of Life from pre-test to post-test as reported by the *Wollongong Sport Program* participants and parents could be attributable to the mean -0.03 unit ($P=0.83$) reduction in the girl’s BMI.

Additionally, the participants improved physical functioning ($P=0.03$) as reported by their parents can be attributable to their participation in the physical activity component of the program. As a consequence of their involvement, positive results were shown including a significant increase ($P=0.005$) in their cardio-respiratory fitness (Kars, 2007; Maessen, 2007). The positive health benefits may have permitted the participants to complete or do other activities they may not have been able to prior to their involvement in the *Wollongong Sport Program*.

**5.3 RECOMMENDATIONS**

The completion of the *Wollongong Sport Program* and the results obtained permit recommendations to be made:

1. Future studies should utilise a control group to control threats to internal validity including history and maturation.

2. As the *Wollongong Sport Program* was a pilot study the results obtained and the modifications suggested should be included in future interventions targeting primary school girls who may or not be overweight.

3. A longer study should be implemented to investigate the longer-term effect/s of an after-school homework club, physical activity and sport program on participant’s physiological, behavioural, and psychological health.
4. The enjoyment scales completed by participants should be used as the basis of future program designs so that the activities selected are relevant and likely to be enjoyed by all children.

5. To include a measure to assess whether participants receive any negative comments from other peers not involved in the program.

6. Continue to use assistants to help facilitate the program as they aid in ensuring participants receive greater levels of personalised instruction, feedback and encouragement.

7. A larger sample size would assist in allowing the results to be powered to detect statistical significant differences.

8. To assess the long-term effect of the program on the participants BMI, waist circumference, perceived competence, and quality of life, follow-up assessments should be conducted at 6 and 12-month intervals after completion of the program.

9. Future after-school programs for primary school students should be designed for single sex groups as boys and girls have different needs and interests. All female groups (participants and facilitators), in particular, enable girls to feel supported and are less intimidated to become involved in physical activity.

10. Future physical activity interventions attempting to reduce childhood overweight and obesity should be implemented with only overweight and obese children, rather than combining them with non-overweight children. The development of specialised programs may have greater positive effects on the perceived competence of the overweight and obese participants involved due to the reduced anxiety of partaking in physical activity in front of others.
dissimilar to them and in turn allow these children to form friendships with peers who have similar body compositions.

5.4 CONCLUSIONS

Analyses of the data collected enabled the following conclusions to be made relating to each of the three research questions that guided this study:

Research Question One: Will the after-school homework club, physical activity and sport program be feasible?

- Primary school girls can be successfully recruited into an after-school homework club, physical activity, and sport program through the assistance of school executive staff.
- Participation can be maintained by creating an environment that is centred on being fun, motivating, challenging, individualised and that allows all participants to be successful.
- Data collection procedures at pre-test and post-test for quality of life, perceived competence and process evaluations can be effectively implemented.
Research Question Two: Will the after-school homework club, physical activity and sport program be acceptable?

- The intended sessions can successfully be implemented in an after-school setting.
- Participants will continue to attend the program if the sessions are enjoyable.

Research Question Three: Will the after-school homework club, physical activity and sport program be potentially efficacious?

- The after-school program produced a trend towards a stabilisation and a reduced BMI in the entire sample of participants.
- The after-school program produced a trend towards a stabilisation and a reduced BMI-\(z\) score in the overweight and obese participants.
- The after-school program showed a trend towards improved perceived competence with a statistically significant result in the domain of physical appearance as well an improved quality of life with significance occurring in the parent report dimension of physical functioning.
- The after-school program for overweight and obese participants showed a trend towards improved perceived competence and quality of life. Statistically significant changes occurred in the domains of scholastic competence and physical appearance.
Dear Parents

University & School Partnership Program

As indicated earlier this term, the school has an opportunity to work in partnership with the University of Wollongong in a special program to assist girls (8-10 years: Year 2-4) who may not necessarily be involved in a great deal of sporting activities and who would also benefit from one on one assistance in formal classroom tasks across one or more key learning areas.

The aim is to have approximately 12-15 girls in this twice a week for 8 weeks program. At the end of the program, it is hoped to determine whether there has been a change in involvement in sporting or physical activities, improvement in class work, self-esteem, eating habits and fitness levels.

Program to be held: Mondays and Wednesdays
Time: 3.20pm-4.00pm afternoon tea & homework support in the senior open space (PDU)
      4.00pm-5.00pm games/physical activity program using the hall, the hard court, the playground
  • Initial come and try-end of Term 1 Monday 2nd April & Wednesday 4th April
  • Program gets fully underway Term 2 Week 2: Monday 30th April & Wednesday 2nd April

Instructors: 4 female postgraduate students from the UOW (one of whom has a teaching qualification)

Activities: After the afternoon tea and homework help-girls will try a range of activities that include: dance, soccer, basketball and other physical activities.

Cost: nil-only a commitment to see out the program in Term 2

If you would like your daughter involved, please complete the following permission note and return to me by next Tuesday 20th March.

W. Bradley
Principal

School & University Partnership Program

To Mr Bradley:

I hereby give permission for my daughter........................................ in ............... 
To take part in the special school and university partnership program that begins this term and continues for approximately 8 weeks in Term 2. I realise that the after school activities will be on Mondays & Wednesdays and will conclude at 5.00pm.

My daughter’s t-shirt size: .......... (Each girl in the program will receive a t-shirt, hat & drink bottle all with a special monogram)

Signed ........................................ Date ...........

Signed ........................................ Date ...........

Signed ........................................ Date ...........

Signed ........................................ Date ...........

Signed ........................................ Date ...........

Signed ........................................ Date ...........

Signed ........................................ Date ...........
APPENDIX B: INFORMATION FOR PARENTS
Thank you for expressing interest in the Figtree Public School After School Homework and Physical Activity Program for girls. The Program is being conducted by students and staff from the University of Wollongong. Full details of all researchers and their affiliations are provided at the end of this information sheet. This information sheet will describe the purpose of this project and outline what is required of you and your daughter should you agree to be involved.

What is the purpose of this study?
The aim of the study is to examine the feasibility, acceptability, and potential efficacy of an after-school homework and physical activity program among Year 3 and 4 girls. To examine the potential efficacy (that is, has there been a positive change as a result of the program) we would like to take some assessments before and after the program.

The homework and physical activity program
The physical activity program focuses on girls developing their confidence and skills in physical activity through participation in a range of different sports such as soccer, dance, netball, basketball, and minor games. The program will run for seven weeks, with two x 1 hour sessions each week on Monday and Wednesday afternoons. Girls will also be asked to participate in homework and reading tasks for approximately 30 minutes before the physical activity program starts. These tasks are designed to help your daughter complete her homework and be tutored by a university student.

What will you and your child be asked to do?
There are 2 key requirements for involvement in the project:

(i) Assessment - a range of measurements will need to be taken and all girls and their parents will be required to complete the same assessments.
(ii) Participation by your daughter in the after school sessions.

(i) Assessment - Firstly, we would like to take some measurements. None of the measurements will hurt your daughter.

At the 1st assessment on Monday 30 April the following measurements will be taken:

- We will measure (in private, away from other girls) your daughter's height and weight, to calculate what is called a BMI (Body Mass Index), along with her waist circumference.
- We will also be giving your daughter a small 'activity monitor' called an accelerometer (approximately 5.1 x 4.1 x 1.5 cm, 43 grams) that is worn like a belt
under their clothes. This monitor automatically records their movement, and we’d like her to wear this during waking hours, for a week at each assessment period.

- A cardiorespiratory fitness test will be conducted. The test is the 20metre shuttle run (also known as the beep test), which is a commonly used fitness test in primary schools.
- Your daughter’s resting heart rate will be measured. One of the assessors will ask your daughter to wear a heart rate monitor for approximately 5 minutes whilst in a seated position.
- We will ask your daughter to fill in a questionnaire related to her health-related quality of life. Questions will be asked about how she feels about daily activities, about her school life, her feelings, and getting along with other children. We will also ask your daughter to complete a questionnaire about her perceived competence.
- Lastly, we would like you to complete the same health-related quality of life questionnaire as your daughter.

At the 2nd assessment on Wednesday 20 June (approximately 8 weeks after the 1st assessments) the following measures will be taken:

- All measures conducted in session one of the assessments will be repeated on this day to identify if any changes have occurred over the duration of the program.
- We would also like to ask you and your daughter to evaluate the program for us through a questionnaire and interview (which may be audiotaped so we can type up the notes).

(ii) Participation the program

An outline of expected involvement for the program is now provided.

The homework and physical activity Program.

If your daughter participates in the program, you will be asked to make a commitment to pick her from school at 5:00pm twice a week (on Monday and Wednesday) for 8 weeks. The program will run for one and a half hours each Monday and Wednesday afternoon starting at 3.30pm on Monday 30 April 2007 and continuing until the Monday 25 June 2007.

Your daughter will be asked to participate in a range of fun and exciting activities during bi-weekly sessions to improve her confidence, enjoyment, and ability in a range of physical activities and sports. Your daughter will also be asked to complete her homework and some reading activities with our University tutors at the beginning of each afternoon session (from 3:20-4:00pm).

In addition, we will also ask your daughter to tell us her thoughts about each session and the program in general in order to evaluate the content and delivery of the program.
What are the risks of the study?

- Parents
  There are no risks to parents in this study.

- Girls
  For your daughter, the activities will be just like those in which they would participate in physical education in school. The program does involve your child participating in physical activity, some of which may be moderate to vigorous in intensity for a short period of time. The structure of the Program will minimise any risks by applying appropriate warm-up, cool-down and stretching activities. We will also allocate frequent rest and drink breaks, and will not sustain bouts of moderate to vigorous activity for long periods of time. The instructors are sensitive to the specific needs of girls this age and are willing to be flexible according to their requirements. Your daughter will be given the opportunity to improve her skills and confidence to participate in a range of activities and games in an enjoyable environment.

Participation in the study.
Individual parents or girls will be free to discontinue participation at any time. Discontinuation of you or your daughter’s involvement will not jeopardise your or their current or future relationship with the University of Wollongong nor with Figtree Public School.

What will happen to the information you and your daughter provide?
All the information collected during this study will be kept strictly confidential and be stored in a locked office. The name of your daughter will not be revealed or used in the study and will only be seen by the researchers involved in the study. The results will assist in making recommendations for future after school homework and physical activity programs designed to improve skills and increase activity levels amongst girls.

Who is conducting the study?
The people in charge of the study from the University of Wollongong are:

- Dr Tony Okely: Senior Lecturer in Health and Physical Education Faculty of Education - University of Wollongong.
- Jess Ryan: Honours Student in Physical and Health Education Faculty of Education - University of Wollongong.
- Tessa Kars: Masters Student Faculty of Education - University of Wollongong.
- Marie-Jeanne Maessen: Masters Student Faculty of Education - University of Wollongong.
- Cassandra Semenchuk: Physical and Health Education Student Faculty of Education - University of Wollongong.
If you and your daughter agree to participate, could you both please complete and sign
the attached consent form and return it to the school. If you have any questions
regarding the study, please contact Jess Ryan on 0402 626 429 or Tony Okely on
4221 4641. If you have any concerns or questions regarding the way the research is
or has been conducted, you can contact the Ethics Officer, Human Research Ethics
Committee, University of Wollongong on (02) 4221 4457.

Your co-operation in this project will be greatly appreciated.
APPENDIX C: INFORMATION FOR PARTICIPANTS
Child Information Sheet

A homework, physical activity and sports program for girls in Years 3 and 4

INFORMATION SHEET

What is the purpose of this study?
To develop a fun and enjoyable physical activity and sports program for Girls in Years 3 and 4. Through this program we hope to improve your skills and confidence and to promote participation in a range of physical activities. The program will also give you tutoring with your homework and reading.

What will you be asked to do?
Firstly, we would like to take some measurements. None of the measurements will hurt you - in fact you may be interested in your results. We will measure your resting heart rate with a heart rate monitor. This will involve you having to wear a band around your chest under your clothes and putting on a watch. You will then sit down for one minute and the monitor will tell us what your resting heart rate is. We will then measure your height and weight, to calculate what is called a BMI (Body Mass Index). No one but you, your parents and the female adult taking the measurements will see what your results are.

You will then be asked to participate in a fitness test called the "beep" test. You may have done this before at school. You will do this together with the other girls.

We will also be giving you a small 'activity monitor' called an accelerometer (approximately 5.1 x 4.1 x 1.5 cm, 43 grams) that is worn like a belt under your clothes. This monitor automatically records your movement, and we’d like you to wear this while you are awake for two weeks. One week at the beginning of the program and another week at the end.

At the beginning and the end of the program, we will also ask you to fill in a questionnaire about how you feel about yourself. There are no right or wrong answers in this questionnaire. We will also ask you to tell us at the
end of each session what activities you did and didn’t enjoy. At the end of the program, we will talk with you and the other girls about what you thought about the program. We will tape this discussion so we can write up the words spoken accurately.

Finally, you will be asked to participate and have fun doing a range of exciting activities during the program, so you will need to make sure you are ready with appropriate clothing and shoes.

**What will my parents be asked to do?**

Parents will be asked to make a commitment to pick you up from the school twice a week (Monday and Wednesday afternoons) at 5.00pm during Term 1 and Term 2. An outline of the times for each week will be provided to you on the first day you attend.

We ask your parents to assist you in caring for your accelerometers and preparing for each session. The attached sheet on accelerometers will give you all the necessary information you and your parents need.

**What are the risks and benefits of the study?**

The activities will be just like those in which you would participate in physical education in school. The Program does involve you participating in physical activity, some of which may be moderate to vigorous in intensity for a short period of time. As such, there are some risks, such as, asthma or bronchoconstriction, joint and muscular discomfort, and elevated blood pressure. The structure of the Program will minimise these risks by applying appropriate warm-up, cool-down and stretching activities. We will also allocate frequent rest and drink breaks, and will not sustain bouts of moderate to vigorous activity for long periods of time. The instructors (all of whom are female) are sensitive to the specific needs of primary school girls and are willing to be flexible according to your requirements. You will be given the opportunity to improve your skills and ability to participate in a range of activities and games while also making new friends and having heaps of fun!

**Do I have to do the study?**

No. Your participation is completely voluntary. If you decide not to take part in the study, that is not a problem and you will not be in any trouble nor will your future relationship with the University of Wollongong or the school be jeopardised.
What will happen to the information I provide?
All the information collected during this study will be kept strictly confidential and be stored in a locked office. Your name will not be revealed or used in the study and will only be seen by the researchers involved in the study.

Who is conducting the study?
The people in charge of the study are Jess Ryan who is studying at the University of Wollongong. Dr Tony Okely from the Faculty of Education at the University of Wollongong is supervising the study. The other five female instructors are Tessa Kars, Marie-Jeanne Maessen, Cassandra Gold, Belinda Griffith, and Taylor Smith.

If you have any questions regarding the study, please contact Ms Jess Ryan at the University of Wollongong on 4221 5551. You can also call Dr Tony Okely on 4221 4641. If you have any concerns or questions regarding the way the research is or has been conducted, you can contact the Ethics Officer, Human Research Ethics Committee, University of Wollongong on (02) 4221 4457.

Your co-operation in this project will be greatly appreciated.

Jess Ryan
Honours Student
University of Wollongong
APPENDIX D: CONSENT FORM
CONSENT FORM

An after school homework and physical activity program for girls in Years 3 and 4

Jess Ryan, Tessa Kars, Marie-Jeanne Maessen, Cassandra Semenchuk and Dr Tony Okely

I have been given information about the after school homework and physical activity program for girls in Years 3 and 4 and had the opportunity to discuss the research project with Jess Ryan who is conducting this research as part of her honours thesis supervised by Dr Tony Okely in the Faculty of Education at the University of Wollongong.

I understand that, if I consent to my daughter participating in this project she will be asked to:

- Wear an activity monitor during all waking hours for seven consecutive days except when in water;
- Participate in an after school homework and physical activity program for 8 weeks;
- Have her height, weight, waist circumference, cardiopulmonary fitness and resting heart rate assessed;
- Answer a questionnaire about her quality of life and perceived competence;
- Answer some questions about her opinion of the program

And I understand that I, as the parent, will be asked to:

- Answer a questionnaire about my daughter’s quality of life;
- Answer a questionnaire about your evaluation of the program.
I have been advised of the potential risks and burdens associated with this research, and have had an opportunity to ask Jess Ryan or Dr Tony Okely any questions I may have about the research and my participation.

I understand that my daughter’s participation in this research is voluntary, I am free to refuse her participation, and I am free to withdraw her from the research at any time. My refusal to her participation or withdrawal of consent will not affect my relationship with the University of Wollongong nor her relationship with the school.

If I have any enquiries about the research, I can contact Jess Ryan on 0402 626 429 or her supervisor Dr Tony Okely on (02) 4221 4641 or if I have any concerns or complaints regarding the way the research is or has been conducted, I can contact the Ethics Officer, Human Research Ethics Committee, University of Wollongong on 4221 4457.

By signing below, I am indicating my consent to participate in the research
An after school homework and physical activity program girls in Year 3 and 4, conducted by Jess Ryan as it has been described to me in the information sheet and in discussion with Jess Ryan. I understand that the data collected from my participation will be used for her honours thesis, and may also be used in journal publications and conference presentations, and I consent for it to be used in that manner and understand that I will not be identified in these publications.
I agree for myself (name) ........................................................................

and my daughter (name) ................................................... to take part in the
study titled

"AN AFTER SCHOOL HOMEWORK AND PHYSICAL
ACTIVITY PROGRAM FOR GIRLS IN YEARS 3 AND 4"

Surname: ............................................ Given Name: ..................................

Address: ............................................................................................

Phone: ....................................... Child's DOB: ......................................

Parent’s/Guardian’s Signature: ...................................................... Date: ..............

Child’s Signature: ................................................................. Date: ..............
APPENDIX E: THE PEDIATRIC QUALITY OF LIFE INVENTORY CHILD REPORT
PedsQL™
Pediatric Quality of Life
Inventory
Version 4.0

CHILD REPORT (ages 8-12)

DIRECTIONS

On the following page is a list of things that might be a problem for you. Please tell us how much of a problem each one has been for you during the past ONE month by circling:

0 if it is never a problem
1 if it is almost never a problem
2 if it is sometimes a problem
3 if it is often a problem
4 if it is almost always a problem

There are no right or wrong answers. If you do not understand a question, please ask for help.
In the past ONE month, how much of a problem has this been for you ...

### ABOUT MY HEALTH AND ACTIVITIES (problems with...)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It is hard for me to walk more than one block</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. It is hard for me to run</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. It is hard for me to do sports activity or exercise</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. It is hard for me to lift something heavy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. It is hard for me to take a bath or shower by myself</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. It is hard for me to do chores around the house</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I hurt or ache</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I have low energy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### ABOUT MY FEELINGS (problems with...)

<table>
<thead>
<tr>
<th>Feeling</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel afraid or scared</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I feel sad or blue</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I feel angry</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I have trouble sleeping</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I worry about what will happen to me</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### HOW I GET ALONG WITH OTHERS (problems with...)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have trouble getting along with other kids</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Other kids do not want to be my friend</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Other kids tease me</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I cannot do things that other kids my age can do</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. It is hard to keep up when I play with other kids</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

### ABOUT SCHOOL (problems with...)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Never</th>
<th>Almost Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It is hard to pay attention in class</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I forget things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I have trouble keeping up with my schoolwork</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I miss school because of not feeling well</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I miss school to go to the doctor or hospital</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
APPENDIX F: THE PEDIATRIC QUALITY OF LIFE INVENTORY PARENT REPORT
DIRECTIONS

On the following page is a list of things that might be a problem for your child. Please tell us how much of a problem each one has been for your child during the past ONE month by circling:

0 if it is never a problem
1 if it is almost never a problem
2 if it is sometimes a problem
3 if it is often a problem
4 if it is almost always a problem

There are no right or wrong answers.
If you do not understand a question, please ask for help.

In the past ONE month, how much of a problem has your child had with ...
### Physical Functioning (problems with...)

<table>
<thead>
<tr>
<th>Physical Functioning</th>
<th>Never</th>
<th>Almost</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Walking more than one block</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2. Running</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3. Participating in sports activity or exercise</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4. Lifting something heavy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5. Taking a bath or shower by him or herself</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>6. Doing chores around the house</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>7. Having hurts or aches</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>8. Low energy level</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

### Emotional Functioning (problems with...)

<table>
<thead>
<tr>
<th>Emotional Functioning</th>
<th>Never</th>
<th>Almost</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feeling afraid or scared</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2. Feeling sad or blue</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3. Feeling angry</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4. Trouble sleeping</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5. Worrying about what will happen to him or her</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

### Social Functioning (problems with...)

<table>
<thead>
<tr>
<th>Social Functioning</th>
<th>Never</th>
<th>Almost</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Getting along with other children</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2. Other kids not wanting to be his or her friend</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3. Getting teased by other children</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4. Not able to do things that other children his or her age can do</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5. Keeping up when playing with other children</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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### School Functioning (problems with...)

<table>
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<th>Almost</th>
<th>Sometimes</th>
<th>Often</th>
<th>Almost</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Paying attention in class</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2. Forgetting things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3. Keeping up with schoolwork</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4. Missing school because of not feeling well</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5. Missing school to go to the doctor or hospital</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
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</tbody>
</table>
APPENDIX G: INSTRUCTIONS FOR PARENTS TO COMPLETE PEDIATRIC QUALITY OF LIFE INVENTORY REPORT
Information about the PedsQL Questionnaire

Dear Parents,

The PedsQL is a questionnaire that assesses health-related quality of life in children and adolescents. It contains questions about your child’s physical, emotional, social, and school functioning in the past one month.

The PedsQL is brief and typically takes less than 5 minutes to complete. It is not a test, and there are no right or wrong answers. Please be sure to read the instructions carefully and choose the response that is the closest to how you truly feel. Please do not compare your answers with your child’s responses. We are interested in your and your child’s individual perspectives. However, feel free to discuss the questionnaire with your child after you have both completed it. If you have any questions, please let me know.

Please complete the PedsQL questionnaire when you have finished seal it in the envelope provided. Give the envelope to your daughter to return it to me on Wednesday 20th June.

All information collected will be kept strictly confidential and the name of your daughter will not be revealed or used in the study and the information provided will only be seen by myself and the fellow researchers involved with the study.

Jess Ryan

Honours Student
University of Wollongong

0402 262 429
jar869@uow.edu.au
APPENDIX H: THE SELF-PERCEPTION PROFILE FOR CHILDREN
# What I Am Like

Name: __________________________ Age: __________ Birthday: __________/________/________

Boy or Girl (circle which)

Sample Sentence

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<tr>
<th>Really True for me</th>
<th>Sort of True for me</th>
<th>Sort of True for me</th>
<th>Really True for me</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
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<tr>
<td>2</td>
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<td>4</td>
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<td>5</td>
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<tr>
<td>6</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Sample Sentence:

Some kids would rather play outdoors in their spare time **BUT** Other kids would rather watch T.V.

Some kids feel that they are very good at their school work **BUT** Other kids worry about whether they can do the school work assigned to them

Some kids find it hard to make friends **BUT** Other kids find it's pretty easy to make friends

Some kids do very well at all kinds of sports **BUT** Other kids don't feel that they are very good when it comes to sports

Some kids are happy with the way they look **BUT** Other kids are not happy with the way they look

Some kids often do not like the way they behave **BUT** Other kids usually like the way they behave

Some kids are often unhappy with themselves **BUT** Other kids are pretty pleased with themselves
<table>
<thead>
<tr>
<th>Really True for me</th>
<th>Sort of True for me</th>
<th>Sort of True for me</th>
<th>Really True for me</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Some kids feel like they are <em>just as smart</em> as other kids their age</td>
<td>Other kids aren't so sure and <em>wonder</em> if they are as smart</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Some kids have <em>alot</em> of friends</td>
<td>Other kids <em>don't</em> have very many friends</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Some kids wish they could be a lot better at sports</td>
<td>Other kids feel they are good enough at sports</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Some kids are <em>happy</em> with their height and weight</td>
<td>Other kids wish their height or weight were <em>different</em></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Some kids usually do the <em>right</em> thing</td>
<td>Other kids often <em>don't</em> do the right thing</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Some kids <em>don't</em> like the way they are leading their life</td>
<td>Other kids <em>do</em> like the way they are leading their life</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Some kids are pretty <em>slow</em> in finishing their school work</td>
<td>Other kids can do their school work <em>quickly</em></td>
<td></td>
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<tr>
<td>14</td>
<td>Some kids would like to have a lot more friends</td>
<td>Other kids have as many friends as they want</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Some kids think they could do well at just <em>any new</em> sports activity they haven't tried before</td>
<td>Other kids are afraid they might <em>not</em> do well at sports they haven't ever tried</td>
<td></td>
</tr>
<tr>
<td>Really True for me</td>
<td>Sort of True for me</td>
<td>Sort of True for me</td>
<td>Really True for me</td>
</tr>
<tr>
<td>-------------------</td>
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</tr>
<tr>
<td>16</td>
<td>Some kids wish their body was different <strong>BUT</strong> Other kids like their body the way it is</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Some kids usually act the way they know they are supposed to <strong>BUT</strong> Other kids often don't act the way they are supposed to</td>
<td></td>
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</tr>
<tr>
<td>18</td>
<td>Some kids are happy with themselves as a person <strong>BUT</strong> Other kids are often not happy with themselves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Some kids often forget what they learn <strong>BUT</strong> Other kids can remember things easily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Some kids are always doing things with <strong>alot</strong> of kids <strong>BUT</strong> Other kids usually do things by themselves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Some kids feel that they are better than others their age at sports <strong>BUT</strong> Other kids don't feel they can play as well</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Some kids wish their physical appearance (how they look) was different <strong>BUT</strong> Other kids like their physical appearance the way it is</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Some kids usually get in <strong>trouble</strong> because of things they do <strong>BUT</strong> Other kids usually don't do things that get them in trouble</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Some kids like the kind of person they are <strong>BUT</strong> Other kids often wish they were someone else</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Really True for me</td>
<td>Sort of True for me</td>
<td>Sort of True for me</td>
<td>Really True for me</td>
</tr>
<tr>
<td>-------------------</td>
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</tr>
<tr>
<td>25</td>
<td>Some kids do <em>very well</em> at their classwork</td>
<td>Other kids <em>don't do</em> very well at their classwork</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Some kids wish that more people their age liked them</td>
<td>Other kids feel that most people their age do like them</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>In games and sports some kids usually <em>watch</em> instead of play</td>
<td>Other kids usually <em>play</em> rather than just watch</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Some kids wish something about their face or hair looked <em>different</em></td>
<td>Other kids <em>like</em> their face and hair the way they are</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Some kids do things they know they <em>shouldn't</em> do</td>
<td>Other kids <em>hardly ever</em> do things they know they <em>shouldn't</em> do</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Some kids are very <em>happy</em> being the way they are</td>
<td>Other kids wish they were <em>different</em></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Some kids have <em>trouble</em> figuring out the answers in school</td>
<td>Other kids almost <em>always</em> can figure out the answers</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Some kids are <em>popular</em> with others their age</td>
<td>Other kids are <em>not very popular</em></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Some kids <em>don't do</em> well at new outdoor games</td>
<td>Other kids are <em>good</em> at new games right away</td>
<td></td>
</tr>
<tr>
<td>Really True for me</td>
<td>Sort of True for me</td>
<td>Sort of True for me</td>
<td>Really True for me</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td>------------------</td>
</tr>
<tr>
<td></td>
<td>Some kids think that they are good looking <strong>BUT</strong></td>
<td>Other kids think that they are not very good looking</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>![ ]</td>
<td>![ ]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some kids behave themselves very well <strong>BUT</strong></td>
<td>Other kids often find it hard to behave themselves</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>![ ]</td>
<td>![ ]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Some kids <em>are</em> not very happy with the way they do a lot of things <strong>BUT</strong></td>
<td>Other kids think the way they do things is <em>fine</em></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>![ ]</td>
<td>![ ]</td>
<td></td>
</tr>
</tbody>
</table>

163
APPENDIX 1: PHYSICAL ACTIVITY ENJOYMENT SCALE
Did you enjoy the activities that you participated in today?
Tick ( 4 ) the box which shows how you felt about the activities.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Really disliked</th>
<th>Disliked a little</th>
<th>Neither liked nor disliked</th>
<th>Liked a little</th>
<th>Really liked</th>
</tr>
</thead>
</table>


APPENDIX J: SAMPLE FACILITATOR REFLECTIONS
Wednesday 16th May 2007

Soccer

- 11 girls in attendance

- **Homework:**
  - Small groups, most groups focused upon mathematics
  - The find a word on Australian discovers worked really well – the girls then explained each term on the find a word to facilitators
  - Seems as though not all girls get homework to complete and the rest do it at home so they do not have much to finish during the sessions

- **Physical activity:**
  - A lack of equipment, half as many soccer balls as requested, activities modified to suit this circumstance
  - *Stuck in the mud* was excellent and the girls were all really active. It worked best when the girls each had a turn at being in and when they got tagged each time they had to do something different for example 5 star-jumps
  - Without 1 ball per person the *secure a hoop* activity was unsuccessful so we did an activity like musical chairs. We had no music which was a limiting factor, but something worthy of use in future sessions. Removal of hoops each time - instead of eliminating girls worked well by having the girls 'left' find a partner or sharing a hoop.
  - Dividing the girls into 2 groups for *in and out* activity and *work out* activity allowed more participation
  - The *work out* was good as the girls tried a variety of short burst activities but to improve needed different / interesting equipment to maintain motivation
  - *In and out* at 5 minutes per station was the right amount of time for practice as the girls were then ready to move on
  - *Partner passing* was good, although not much vigorous physical activity, to do this implemented a running component worked well but was not motivating
  - Girls were very skilled at kicking and trapping
  - *4 square soccer* was enjoyed and it worked best because we only did it for about 5 minutes – any longer and interest would have been lost. This activity allowed the girls to work together. Only problem was XXXX and XXXX just wanted to work together with no one else – this affected the other girls. When I tried to split them into different groups, XXXX stopped participating and became negative.
  - For the last 5 minutes we played *mini games of soccer* and this allowed me to see the girls skill level they were more skilled then I had anticipated. For future sessions I think it would be beneficial to
slightly modify and introduce ‘new and interesting rules’ into the modified games to maintain enthusiasm and participation.
- Greater activity needed in future sessions

• **Behaviour:**
  - The majority of girls were really behaved and enthusiastic
  - XXXX and XXXX only wanted to be involved if they were in the same groups did disrupt team work, need to be mindful of this particularly given these girls are the most vocal
  - But in the *hoop-circle challenge* XXXX and XXXX were split into either side of the circle and all girls worked amazingly together to get the hoop around the circle in 35 seconds the best time so far - team building / challenge games are really enjoyed and bring a sense of community
  - Started to notice peer feedback particularly between the younger girls

• **Parents Feedback:**
  - Really positive
  - “Thanks I really appreciate it”
  - “XXXX really enjoys coming”

• **Future Sessions:**
  - Need to schedule in more drink breaks
  - Have activities that enable girls to work in small groups / teams with facilitators this was loved by the girls
  - Try and implement were practical new equipment that the girls may not have seen or used before, as a means of making the girls feel as though when they come to the program it will be exciting, fun and new.
APPENDIX K: ATTENDANCE RECORD
<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
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<th>K</th>
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<th>M</th>
<th>Attendance</th>
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### Monday

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Public Holiday
APPENDIX L: ETHICS APPROVAL
INITIAL APPLICATION APPROVAL
To reply please quote: H006-345
Further Enquiries Phone: 4221 4435

27 February 2007

Dr Anthony Okely
Faculty of Education
University of Wollongong

Dear Dr Okely,

Thank you for your response dated 21 February 2007. I am pleased to advise that the application has been approved.

Ethics Number: H006-345
Project Title: An after-school homework club, physical activity and sport program for primary school girls.
Researchers: Dr Anthony Okely, Ms Jess Ryan, Ms Marie-Jeanne Maessen, Ms Tasaa Kays
Approval Date: 22 February 2007
Expiration Date: 21 February 2008

The University of Wollongong, NSW, Health and Medical HREC is constituted and functions in accordance with the NHMRC National Statement on the Ethical Conduct in Research Involving Humans. The HREC has reviewed the research proposal for compliance with the National Statement and approval of this project is conditional upon your continuing compliance with this document. As evidence of continuing compliance, the Human Research Ethics Committee requires that researchers immediately report:

- proposed changes to the protocol including changes to investigators involved
- serious or unexpected adverse effects on participants
- unforeseen events that might affect continued ethical acceptability of the project.

You are also required to complete monitoring reports annually and at the end of your project. These reports are sent out approximately 6 weeks prior to the date your ethics approval expires. The reports must be completed, signed by the appropriate Head of School, and returned to the Research Services Office prior to the expiry date.

Sincerely yours,

[Signature]
Chairperson
Human Research Ethics Committee
APPENDIX M: NSW DEPARTMENT OF EDUCATION APPROVAL
Miss Jessica Ryan  
PO Box U83  
University of Wollongong NSW 2500

Dear Ms Ryan

I refer to your application to conduct a research project in NSW government schools entitled an After-school homework club, physical activity and sports program for primary school girls. I am pleased to inform you that your application has been approved.

You may now contact the Principal of Figtree Public School to seek their participation.

Your approval will remain valid until 21 February 2008. This approval covers the following researchers and research assistants to enter schools for the purposes of this research:

Tessa Kars  
Marie-Joanne Maessen  
Dr Tony Okey

You should include a copy of this letter with the documents you send to Figtree Public School. I draw your attention to the following requirements for all researchers in NSW government schools:

- School Principals have the right to withdraw the school from the study at any time.
- The approval of the Principal for the specific method of gathering data must also be sought.
- The privacy of the school and the students is to be protected.
- The participation of teachers and students must be voluntary and must be at the school's convenience.
- Any proposal to publish the outcomes of the study should be discussed with the Research Approvals Officer before publication proceeds.
When your study is completed, please forward two hard copies of your report. One should be mailed me at the Illawarra and South East Regional Office PC Box 1228, Wollongong 2500 and the second to the General Manager, Planning and Innovation, Department of Education and Training, GPO Box 33, Sydney, NSW 2001.

Yours sincerely

Angela Byron
Professional Support Officer
Illawarra and South East Region

27 March 2007
APPENDIX N: SAMPLE SESSION PLAN
SESSION 2: BASKETBALL AND NETBALL COMMONALITIES II

Date of Session: 
Length of Session: 60 minutes

Session Aims:
• FUN and enjoyable
• Challenging yet all girls are able to experience success
• Working together as a team
• Girls remain physically active most of the time
• Practising and developing passing and catching skills from previous session
• Moving away from opponents and moving towards the ball

WARM UP (10 – 15 minutes)

Protect Your Tail (10 – 15 minutes)

Each girl has a Velcro oz tag belt with two tags positioned on either hip. In a marked out area the girls must move (as instructed) they need to attempt to ‘steal’ fellow girl’s tags. Once a tag is stolen it must be placed on the sides of their belt.

The girls may not protect their tags with their hands, and must only steal one tag at a time. After a certain period of time the activity stops and the girls tally the number of tags they have collected.

Key Teaching Points
• Safety of the fingers, demonstrate pulling the tags off and not pulling at the belt
• Continual movement is the key to protect you tags – question and ask girls what types of movement worked the best
• Looking around and see who is in close proximity
• Remember how to pull tags off when we played fox and hen

Equipment Needed:
• Velcro belt and 2 tags per student
• 4 cones to mark out playing area

STRETCHING (5 minutes)

Gather students in a semi circle with the instructor out the front and in the middle. The instructor each demonstrate each stretch (demonstrate and count for approx 15 seconds). Tell girls that the stretches should feel slightly uncomfortable but should never hurt.

BODY OF LESSON (40 minutes)

Partner Passing and Catching
Get girls to move (running, leaping, side steps, and jumping – more demanding movements) in a designated marked out area and then every 20 seconds call out a different action they need to perform. Encourage students to move and join with different girls in the group. The last action will be to find a partner.

**Different Actions:**
- Touch 3 knees together
- Join hands with 6 other people
- Groups of 4
- Jump on the spot
- Find someone with the same hair colour
- Have only one foot on the ground

Once the girls are in a pair, give each a ball. Each instructor will have 2 or 3 pairs depending on numbers. The girls will each practice throwing and catching between each other. Throws include chest and bounce passes. Join 2 groups together and have 2 v's 2 small sided games of possession.

**Key Teaching Points:**
- Step forward with opposite foot
- Ball caught with the hands only
- Eyes on the ball, watch where it goes

**Possible Modifications:**
- Place targets on wall to give the girls somewhere to aim the ball. Having different colours on the target allows for a scoring system to be introduced
- For the bounce pass the girls aim to get the ball to bounce in the hoop – provides a aiming target for the girls

**Equipment Needed:**
- 1 ball per pair
- 4 targets and 4 hoops (if using)

**Peanut Butter and Jam**

Girls are to stand in 3 small groups to increase participation rates. Players are to pass one of the balls “Peanut Butter” around the circle to anybody they like. The second ball “Jam” is also thrown between the girls (introduced after the girls are familiar and confident with 1 ball). They need to keep both balls moving without stopping, with the object being for jam to catch up with the peanut butter. When one person gains both balls they will yell peanut butter and jam. Repeat activity. To increase activity play until once then get the girls to perform various movements i.e. jog into the centre and sprint out, do star jumps, hop 10 times per foot, skip in a circle etc

**Key Teaching Points:**
- Encouraging and supporting girls working together as a team to experience success at the task
- Reinforcing passing and catching skills from first session
Possible Modifications:
- Beach balls to increase time students have to catch the ball
- Time each attempt, see if they can improve each time
- Take away the concept of peanut butter and jam and instead have one student standing in the middle of the circle and get them to throw the ball high into the air at the same time call a students name to run in and catch the ball

Equipment Needed:
- 2-4 balls (beach balls, basketballs)

Burst Balloon Ball (15 minutes)
The girls are divided into 2 groups. A grid is marked out and at each end a goalie (an instructor) will stand on a chair armed with a pin. The objective is for each group to push and knock the balloon towards their goalie. A goal is scored every time a balloon is burst. This activity would need to be played inside, if outside replace balloons with either a Frisbee or vortex – therefore we would need to increase the playing space, still maintain instructors as goalies or we could hold a hoop for the girls to aim at.

Key Teaching Points:
- Team work between the girls and the instructors
- Continued movement
- Creating space between players
Modifications:
• Increase grid dimensions
• Use Frisbee or vortex instead of balloons
• Each girl can only hit the balloon twice in a row

Equipment Needed:
• Balloons
• 2 chairs
• 2 pins
• 4 domes

Knock ‘em Down (10 – 15 minutes)

Girls will be divided into 4 teams (2 playing areas), each having one side of a marked area. The objective is to knock down as many of the opponents pins as possible. When a player catches or collects a ball they then throw it behind the centre dividing line aiming to knock down as many pins. Players can move in their area if they do not have the ball. A team can be declared the winner if they knock down the most pins, knock down the most pins in an allocated time or the first to knock all the pins over. Swap teams so they play another team.

Key Teaching Points:
• Encouraging and supporting girls working together as a team to experience success at the task
• Tactics
• Moving and positioning of body to catch the ball for more opportunities to knock the pins
• Remember to emphasis or add rules to encourage girls to continually move and not stand still

Possible Modifications:
• Can run with the ball
• Use softballs and girls have to hit each other below the knees, if they get hit then they move behind their
opposing team and if the ball reaches them they can get the other girls out by rolling the ball and hitting the team.

Equipment Needed:
- 1 ball (beach ball, basketball etc)
- Pins (milk, soft drink and juice bottles)
- To distinguish team pins have coloured balloons taped on top of each one or have coloured cardboard on top.

CONCLUSION (5 minutes)
- Complete Session Evaluation Forms
- Feedback and encouragement as group and individually
- What did you like the best?
- Did you have FUN?
APPENDIX 0: WOLLONGONG SPORT LOGO
REFERENCE LIST


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