

Steps in the Right Direction, Against the Odds

An evaluation of a community-based programme aiming to reduce inactivity and improve health and morale in overweight and obese school-age children

The Programme on which this article is based has been delivered in community settings in a town in Northern England, referred to as 'Newtown'.

Abstract

The paper describes an evaluation of a 48-week physical activity and nutritional education programme for overweight/obese school-age children using quantitative and qualitative methods. The majority of participants were obese or severely obese when enrolled and whilst some improvements in BMI, self-esteem and engagement in a range of physical activities were noted, difficulties in evaluating a complex community-based intervention were highlighted. Children, parents and health professionals described a range of benefits from attending the programme but more intensive services are likely to be needed for the most seriously obese children and for those families resisting intervention.

Introduction

Childhood obesity is a complex public health issue, presenting a growing threat to children's health, and a drain on National Health resources (NAO, 2006). The prevalence of obesity in children (aged 2 – 10 years) increased from 9.6% in 1995 to 13.7% in 2003 (Jotangia et al, 2005). A National Child Measurement Programme collecting data on children's height and weight began in 2005/6 (DOH, 2004) in order to track progress on the target of halting the year on year rise in obesity in under 11s by 2010. Current Government strategy is to reduce the proportion of overweight and obese children (under 11) to 2000 levels by 2020 (DOH, 2008). Research has found that parents do not always acknowledge their responsibility for tackling their children's

obesity nor do they recognise the connection between children's unhealthy weight status and long-term health problems (Jeffery et al, 2005). Within Newtown, levels of overweight (BMI above 91st Centile) and obese (above 98th Centile) children at reception (7.6% and 4.4% respectively) and year 6 (7.8% and 7.3%) were similar to the national average in 2006/2007 (YHPO, 2008). The Local Health Profile (APHO, 2008) reveals above average levels of deprivation (26.8% in Newtown living in 20% most deprived areas of England compared to 19.9% nationally) and slightly above average levels of child poverty (23.3% compared to 22.4% nationally).

Childhood obesity has been correlated with increased cardio-vascular risk and increases in Type 2 Diabetes, a disease usually diagnosed in adulthood (Steinbeck, 2001). It substantially increases risks of orthopaedic, respiratory and psycho-social disorders; and obese children are more likely to become obese adults (DOH, 2006). The risk of becoming obese is greatest among children who have two obese parents, which may be due to genetic factors or to modelling of both eating and exercise behaviours (Dietz, 1983).

While it is widely believed that children currently eat too much and exercise too little, causes of obesity have been found to relate to the content and pattern of eating, with more consumption of energy-dense foods/fast foods/soft drinks, and less consumption of milk, and an increase in snacking (Eisenmann, 2006). Fizzy drinks and sugar and chocolate confectionery are the top three sources of non-milk extrinsic sugars in children's (7-10 years) diets (BMA, 2005). Weight loss intervention programmes for children need to focus on dietary improvements linked to these findings. What is clear is that children are walking less (due to car usage), in particular for school travel, and that safety concerns have led to their playing less freely (Mackett and Paskins, 2008).

It is widely recognised that diet *and* exercise have a part to play in combating childhood obesity (Fox and Page, cited in Kopelman, 2001), although expert opinion on the relative impact of diet and physical activity on the prevention and treatment of obesity is divided (Biddle and Dovey, 2009). Research about barriers to physical activity amongst children has suggested that preferences and priorities, family life and parental support, and restricted access to opportunities all play an important part (Brunton et al, 2003). Recommended approaches include taking into account children's views and involving parents (Brunton et al, 2003). This latter point seems pertinent given the links between parent and child obesity (Dietz, 1983).

Evidence about effective prevention/treatment of child obesity is still at an early stage. The National Institute for Clinical Excellence (NICE, 2006) recommends multi-component interventions including behaviour change strategies to increase physical activity levels (or decrease inactivity) and improve eating behaviours and diet. A recent meta-analysis further supports this notion, suggesting multiple interventions (diet *and* exercise) are needed to tackle the range of causal pathways of child obesity (Harris et al, 2009). Evidence from the National MEND Programme has found that intensive, child-orientated, multi-disciplinary programmes, with parental involvement, can improve the health and psychological well-being of obese children (Swain, 2009). There is an absence of research on successful interventions addressing ethnic and gender differences. Changes in psycho-social health are regarded as an essential component of any weight loss intervention, although the links between obesity and low self-esteem are clearer during adolescence than for younger children (Hill, 2005). A recent research overview on childhood obesity (Reilly, 2007) proposes that prevention programmes should focus directly on obesity rather than healthy living; should modify target behaviours; do no harm; and produce measureable impacts. Prevention programmes should promote breast-feeding; reduce television viewing and screen

time; promote physical activity; and reduce the intake of fruit juices and sugar sweetened fizzy drinks. Children's well-being has been found to increase when they are involved in responsible programmes aimed at the prevention or treatment of obesity. Reilly refers to the Planet Health Programme conducted in schools in the USA (Gortmaker et al, 1999), which successfully prevented new cases of obesity in girls; the positive effects of the programme are attributed to a reduction in television viewing. Research evidence has concluded that further evaluations of what does and does not work for overweight and obese children are needed (Oude Luttikhuis et al, 2009).

Newtown Kids' Programme

Since 2003, Newtown Kids' Programme (NKP) has provided physical activity sessions and, since 2007, more formal educational elements, including nutrition, behaviour change, and working with parents, for school-age children in Newtown. The programme aims to engage overweight and obese young people and to increase their activity levels and knowledge, with a view to health gain. The programme is not a clinical intervention and does not provide treatment for obesity.

Children and young people joining the programme are encouraged to attend scheduled NKP physical activity ('Fusion') sessions or chose their own independent physical activity programme. All children and young people, regardless of the method of physical activity commitment chosen, are encouraged to attend 12-weekly individual review sessions (usually with a parent) for height/weight measurements and additional support including nutritional advice.

During the course of the evaluation (2006 – 2008), 'Fusion' sessions were delivered after school in sports and community centres usually attracting between 8 and 16 children per session. The sessions comprised fun, team-based physical activities (for

children and young people) followed by (since 2007) a group educational session for children *and* parents focussing on healthy eating. Weekend sessions were run in localities with high numbers of Asian children who were unable to attend after school because of mosque attendance commitments. Separate sessions were run for children aged 5 to 11, and 11 to 16 with 11 year olds choosing their preferred session depending on their level of maturity.

The majority of referrals to the programme were made by school nurses and other health professionals after seeking parental consent. A significant number of self-referrals were also made by parents, underpinned by the promotion of the programme in schools and local sports centres and a very accessible and engaging website.

Staff involved were all educated to degree level and hold diplomas and professional qualifications in exercise and fitness. Newtown Primary Care Trust (PCT) took responsibility (with the local authority) for joint funding the programme. Additional funding was provided by the Lottery/Sport England.

The evaluation aimed to explore the effectiveness of a community-based exercise and nutritional programme to inform local practitioners, and to contribute to debates about effective approaches towards tackling childhood inactivity and obesity. A range of quantitative and qualitative methods were used as detailed in the methodology section. Although the evaluation focused primarily on the NKP programme as described above, it is relevant to note that the national MEND Programme was introduced in Newtown authority in 2007 and 23% of the total cohort were also enrolled in this programme.

Methodology

Self-esteem was measured using an adaptation of the Rosenberg Self-Esteem Scale (Rosenberg, 1979), a 10-item self report measure of global self-esteem. Scores can range from 10 to 40 with higher scores indicating higher self-esteem. A child-friendly version of the scale was used to increase engagement amongst younger children. In this version, the 4-point scale written response options ('strongly agree' to 'strongly disagree') are replaced by a series of typographical emoticons as detailed in Figure One. This adapted scale has been used successfully by the evaluation team on a number of other occasions (see for example Rochdale Children's Fund, 2008).

Figure One

Attitudes to physical activity were recorded using the Children's Attitudes to Physical Activity Scale - CATPA (Schutz et al, 1985) which assesses attitudinal dispositions towards the benefits of physical activity in terms of 'social growth' (meeting new people); 'social relations' (spending time with friends); 'health & fitness' and, in the case of older participants, 'release of tension'.

An in-house 'Type and Frequency' measure recorded participation in physical activities outside the NKP Fusion sessions. This measure records 12 types of activity for example walking; swimming; and playing out to assess the 'range' of activities participated in. Participants recorded frequency of participation for each activity on a 5-point scale ranging from 1 (never) to 5 (five times per week).

All participants in the programme were encouraged to attend 12-weekly review meetings when height and weight measurements could be recorded and converted to Body Mass Index (BMI). In this study, children above the 91st Centile were classified as

overweight, those over the 98th Centile as obese (DOH, 2006) and those over the 99.6th centile as severely obese (SIGN, 2010).

Demographic and evaluation data were entered onto an SPSS database. To comply with Data Protection requirements, all data inputting took place at the NKP office and access to the database was password protected. Ethical approval was obtained from the Local Research Ethics Committee.

The evaluators held interviews and focus groups with groups of younger and older children (N = 50), and, separately, with parents / carers (N = 30) to discuss views about NKP and its impact. All sessions were tape-recorded and transcribed. NKP staff provided case studies to illustrate individual children's progress and completed follow-up telephone questionnaires in 2008 with 36 parents whose children had ceased attending. Focus groups and interviews were also held with NKP staff (N=7) and allied health professionals (N=10).

NKP staff administered evaluation questionnaires during review sessions due to evaluation budget constraints, which is recognised as a limitation of the methodology, as some degree of "social desirability" is possible. It is also possible that some of the missing data could have been avoided if it had been viable for the evaluators to attend sessions and collect the data directly. The evaluation framework recognised these limitations, and inclusion of qualitative data provided other types of information to supplement questionnaire data.

Findings - Quantitative Data

Enrolment on to the programme was continuous throughout the two year evaluation period. A total of 325 children and young people went through the scheme during this

period. However, baseline data is only available for 195 participants, and full data sets (baseline (time one) and time two) are only available for 90 participants. Demographic data was available for the whole cohort of 325 and 166 (51%) were female and 159 (49%) male. Participants' age ranged from 5 – 16 years with the majority (63%) aged 5 – 10 years. Two thirds (223 or 68%) attended primary (infant or junior) school and a third (100 or 31%) attended secondary school. Two children were attending special educational provision.

The majority of participants (59%) recorded their ethnicity as White British; 28% South Asian; and 12% as Black or mixed. Recent population estimates (ONS, 2006) for Newtown note that 76% of children (0 – 15 years) were white; 18% Asian; and 6% Black, mixed or other. Thus, children from minority ethnic groups were over-represented in the Newtown sample, consistent with the known pre-disposition of the Asian community to higher levels of obesity (NAO, 2006). About 10% of the sample considered themselves to have a disability. Of these more than half had a learning disability; and about a quarter a physical disability.

At the end of the evaluation period, 192 of the 325 participants were still actively enrolled in the programme. Of the remaining 133, 29 had completed the full 48-week programme and 104 had ceased attending or failed to attend review/exit appointments, representing a “drop-out” rate of 32%. Other studies have reported lower drop out rates (10% - Sacher et al, 2005) but based on considerably lower sample sizes. Participants were more likely to remain enrolled if they were also attending MEND (82% compared to 52%).

Follow-up interviews with parents whose children had stopped attending provided mainly positive feedback about NKP physical activity and review sessions and the

majority were engaged in physical activity elsewhere. A small proportion of children and young people had ceased attending as they were shy/embarrassed about attending Fusion sessions.

149 of the 325 participants regularly attended Fusion sessions and the mean number of attendances was 5.59 sessions. The remainder were organising their own physical activity programme, usually with the help of a parent.

For each outcome measure, detailed analysis was completed to identify any significant differences due to age, gender, ethnicity, disability, length and type of engagement (e.g., whether Fusion sessions attended); and additional involvement in the MEND programme (applicable to 32 of the evaluation sample) and these differences, where observed, are reported below. For each measure, the number of participants for whom at least two sets of data was available is indicated.

Physical Measurements

Table 1 indicates the very high prevalence of obese and severely obese children in the sample of 195 participants for whom physical measurements were recorded at baseline.

Table 1

The small number of children below the 91st Centile reflects the fact that siblings/friends of overweight children sometimes attend to provide peer support. In addition, sessions

can be accessed by “inactive” as well as “overweight” children and those who are borderline, to provide a preventative approach.

Changes in BMI from baseline to ‘time two’ (either end of evaluation or when the young person left the programme - on average 5.5 months) were analysed for those participants for whom data was available (90 of the 195). 57% (51) recorded decreases in BMI, 3.4% (3) recorded no change and 35 (39%) recorded increases in BMI. The mean decrease in BMI was -0.9 which is consistent with research for the MEND programme (Sacher et al, 2005).

To further compare findings from this evaluation with other studies, BMI scores were converted to standard deviation scores (SDS). Carnegie Weight Management (2007) reports changes in BMI SDS as -0.07 for the MEND programme; -0.08 for the Watch It programme and -0.11 for its own intervention programme in West Yorkshire. It is not clear whether these reported outcomes are based on data from children completing the programmes or ‘intention to treat’, nor whether reported results represent whole cohorts or simply those with reduced BMI.

Change in BMI SDS for the NKP sample of 90 was 0.006 (i.e., a slight increase). For those children (N=51 or 57% of sample) who recorded a decrease in their BMI over time, the change in BMI SDS was -0.448.

Weight (kg) decreased for 35% (31) of the evaluation sample of 90 participants and was maintained for a further two children (2.2%). Fifty-six children (63%) recorded increases in weight over time. Reilly and Wilson (2006) have noted that significant weight losses would not necessarily be expected with a paediatric sample since

children may grow into their weight, and therefore weight maintenance can be a significant indicator of success.

Most children (78) remained at the same point on Centile charts but nine improved: six children moved from the 'severely obese' to the 'obese' category; one from 'obese' to 'overweight' and two from 'overweight' to below the 91st Centile (i.e., healthy weight). Three children deteriorated, moving from 'overweight' to 'obese' (2) and from 'obese' to 'severely obese' (1). Relatively small changes in children's weight following intervention is consistent with other research in this area such as that by Ebbeling et al (2002).

Cross-tabulations were used to explore sub group differential outcomes in Centile scores and improvements were more likely to be associated with participants who were younger (≤ 7 years), female, White British and able-bodied.

Self Esteem

Self-Esteem questionnaires were completed by 92% (300) of the total cohort and the mean Time 1 (T1) score was 29.39 indicating moderate levels of self-esteem. Time 2 (T2) scores were available for just over a third of the baseline sample (N = 115) and the mean score increased to 32.65. Overall, self-esteem increased for 72% of this T2 sample, remained the same for 8% (9) and decreased for 20% (23) as illustrated in Figure Two.

Figure Two

A paired samples T-test found the increase between T1 and T2 scores to be statistically significant ($T = -6.997$, $df = 114$, $p = 0.0001$). A one-way Anova further

explored the impact of age on final self-esteem scores and a significant difference was found ($F = 4.392$, $DF = 3+111$, $P = 0.006$) with younger children scoring higher (on average) than older children. No differences on the basis of gender, disability, ethnicity, involvement in MEND or Centile scores were observed. Fusion session attendance and self-esteem was positively correlated so that as attendance increased, so did self-esteem ($R = 0.204$, $N = 115$, $P = 0.028$). However, at 0.2, the correlation is very weak.

CATPA

Just under a third of the total cohort (100) completed the CATPA Scale on at least two occasions and scores for both younger and older participants indicated positive attitudes towards physical activity at baseline. No significant differences in scores over time were observed.

Of interest is that young people with a disability had more positive attitudes towards physical activity than those without ($t = 4.523$, $df = 39$, $p = 0.0001$) and a statistically negative correlation between the time enrolled on the programme and attitudes towards physical activity on the health and fitness domain for younger participants was observed ($r = -0.286$, $n = 62$, $p = 0.024$). Thus greater programme involvement appeared to have a negative impact on attitudes such that the longer younger children were enrolled on the programme, the less likely they were to feel positive about the idea of “taking part in physical activities to make your health better and get your body into better condition”. This suggests that younger participants may have unrealistic expectations about the time needed to improve body condition and health although the weak correlation should indicate caution in the interpretation of this finding.

Compared to normative data (Schutz et al, 1985), scores for younger participants support a hypothesis that attitudes of overweight/inactive children towards physical activity are less positive than those found in a healthy weight sample. Older participants displayed more positive attitudes than normative data samples perhaps because young people are now more aware of positive health messages in relation to physical activity. A “social desirability” effect is also possible as participants may have chosen the option that NKP staff would wish to see. Another explanation is that those with more positive attitudes towards physical activity are more likely to enrol on programmes. Older participants may have also needed to be more positively motivated towards attendance as they often made their own way to sessions unlike younger children who relied on parents.

Type and Frequency

117 of the total cohort of 325 completed the type and frequency measure on at least two occasions. Of the twelve activities assessed, slight increases in mean scores were recorded for nine activities, and slight decreases for three – PE, team sports and cycling. Sixty-nine (59%) of the 117 respondents increased their frequency of participation in the activities listed; five (4%) recorded no change, and 37% (26) recorded decreases. Fifty-four (46%) of the 117 respondents increased the range (type) of activities they participated in; 20% (23) recorded no change; and 34% (40) recorded decreases.

Figures 3 & 4

Younger participants (up to 13 years) and females were more likely to increase the range of exercise undertaken. Participants aged 8 – 10 years and male participants were more likely to increase the frequency of exercise participated in. White British

children were more likely to increase both range and frequency of exercise participation compared to children from minority ethnic groups. Children with a disability were less likely to increase range and frequency of exercise undertaken.

Findings - Qualitative Data

Children and young people demonstrated a clear understanding of the aims of the programme and described improvements in self-confidence and other benefits from attending such as making new friends:

I've got more fit. I eat less and I'm just more active (boy aged 10).

I've only got two Easter eggs this year. I've lost a stone. I can do cartwheels now (girl aged 10)

I've made more friends and I'm losing weight...I was slow at running and I can go faster now (girl aged 8).

I thought it would be good fun, and it's good for my health...I'm getting very good at talking to people now (girl aged 10)

Children were knowledgeable about healthy eating, recognising the importance of changing diet and being more adventurous about their choice of fruit and vegetables. Levels of embarrassment about weight-related issues, and worries about being bullied at school had reduced since attending NKP. One of the older children noted:

When you've been bullied at school...they [NKP] make you feel good in yourself and make you feel like your confidence has grown back...They're very friendly [and] help you.

Parents confirmed the benefits for children attending, including increases in self-confidence, morale and fitness; improved diet and evidence of healthy eating; a willingness to try new activities and improved attitudes resulting in greater enjoyment of exercise. Parents gave examples of the programme successfully integrating children with disabilities. Staff were described as approachable; and their advice for children as authoritative and motivational. Parents welcomed children of similar abilities being able to come together in a stigma-free environment:

They've got higher self-esteem, they stand up for themselves now...they say "Well, you watch me. I'm going to join in".

(My son) sees exercise as fun now, not something he has to do to lose weight

I was relieved that there was (somewhere) they could come and they'd be treated equally, regardless of their size or issues.

Case studies produced by NKP staff provided evidence of thorough assessments and quarterly reviews of children's progress and placed equal emphasis on children's physical activity levels and on their mental attitudes.

Some children made spectacular progress, for example, a thirteen-year old Pakistani boy who achieved a weight loss of 9.6 kilograms over a twelve-month period, and a

significant BMI reduction while he continued to grow taller. He was described as having *a huge smile on his face* because of his increased levels of physical activity which he maintained during an eight-week holiday in Pakistan. Other children's progress was more uneven. An eleven-year old girl attended twenty-five NKP sessions and her confidence increased as she made new friends. Her attitudes to physical activity improved; she was happier, felt healthier and less tired doing activities, although she was unsure whether she had lost weight. Her mother and her older sister attended MEND sessions to provide her with support. To start with, she lost 1.3 kilograms, then put the weight back on by reverting to previous unhealthy eating patterns on holiday, leading NKP staff to programme in more one-to-one sessions focusing on diet and weight management.

The clearest evidence for the qualitative data obtained from children relates to their positive engagement with and enjoyment of the programme and activities, which included, for some, a belief that they had lost weight. Some of these children may not have completed the programme but there was good evidence of impact on morale. Actual weight loss and impact on attitudes would be harder to evidence.

Parents who identified themselves as overweight seemed equally determined for their children to take advantage of the programme, although being overweight themselves could make this more difficult. One mother acknowledged...*I'm not a very active person...my conscience is playing on me thinking I should be doing something.* Another mother who cheerfully acknowledged her own size wanted to deal with her 12-year old's weight problem...*before it starts getting really bad.* She was encouraging him to become involved with NKP to avoid problems on the scale of her own. Other parents were trying to set their children a good example by becoming fitter themselves.

The evaluators, who attended numerous Fusion sessions over the two-year period, observed positive and constructive engagement by NKP staff with children and young people, including children with special needs and behavioural problems. Staff were consistently at pains to reduce stigma attached to obesity and weight problems.

Views of Professionals

The main concerns of school nurses (N = 8) and dietitians (N = 2) consulted were about children and young people not in contact with the programme at all. School nurses observed that while most parents appreciated that their children had weight problems, some did not wish to pursue a referral to NKP; and some parents were defensive and “in denial”. Both dietitians and school nurses expressed frustration that attendance at the programme was voluntary. School nurses had particular concerns that Asian children frequently had to attend the Mosque/Madrasah after school, preventing attendance at NKP sessions. Asian families also sometimes appeared to give overweight boys a privileged status and could therefore be less likely to recognise their obesity problems.

NKP staff (N = 7) were very clear about programme objectives...*The main aim of the whole team is to get more inactive young people more active, more often, with a view to health gain.* NKP staff were confident that with the flexible range of programmes now available, including MEND, they could help achieve improvements for young people who took part. Some children achieved dramatic health gains. For others, simply attending NKP sessions regularly constituted success. Barriers included overweight or obese children still being overlooked by GPs or school nurses. Some parents resented their children being recommended for the NKP service. Some teachers were reluctant to recommend children because of a potential backlash from

parents, or through concerns that they could undermine a child's self-confidence because of stigma about weight and body image.

Strategic managers for the local authority and PCT were aware of the complex, deep-rooted changes in behaviour necessary to combat childhood obesity. Strategic direction was now clearer as the evidence base from the National Child Measurement Programme was improving. Nonetheless, childhood obesity levels were rising rapidly and the national target to achieve a return to 2000 levels by 2020 was "extremely ambitious". Prioritising the needs of the South Asian population was felt to be a key priority for the future as well as a tiered approach including day clubs and residential programmes for all children over the 98th Centile. Such approaches are already being developed by some Health Authorities in the region. Recent evidence from France suggests such multi-level interventions can be extremely effective (Czernichow et al, cited in Baur, 2009).

Conclusion

Engagement with the NKP Programme worked well. Nearly 60% of participants were still actively enrolled after two years. A further 15% had successfully completed their programme prior to exiting the scheme. Feedback from participants who dropped out of the programme was mainly positive and most were engaged in physical activity elsewhere. The Programme was particularly successful in targeting children with very serious weight problems; 84% of programme participants were over the 98th centile. A range of evidence highlighted improvements in children's morale and self-esteem, which increased in line with session attendance. Most children became more active. Progress was more marked for younger participants, and rather less evident for children from ethnic minority groups than for white British children. Overall, most

children recorded little weight reduction and most remained at the same point on centile charts, although rising obesity trends were halted.

However, a significant limitation to the evaluation reported here is the relatively small percentage of the total cohort on which outcome measures are based. Although some positive improvements have been noted for around a third of the cohort, it could be argued that the remaining participants for whom time two data was not available have achieved less successful outcomes. The difficulties in successfully completing a robust, independent evaluation of an ongoing community based programme with a limited budget have been evident here.

Notwithstanding this caveat in relation to quantitative outcome data, the programme has achieved considerable success, judged against Reilly's (2007) criteria that programmes should focus on obesity (not healthy living); modify target behaviours; produce measurable results; and do no harm. Three factors appear closely linked with the Programme's success: Parents played a key role acknowledging children's weight problems, encouraging them to attend and providing consistent support. Children enjoyed activity sessions, made new friends in an environment where they were treated equally, and learnt much about exercise, and a healthy lifestyle and diet. Staff provided stimulation and encouragement and helped children keep focused on areas for improvement; and their commitment to reducing stigma attaching to obesity and disability was impressive. These basic ingredients are likely to be needed in similar community-based programmes. Other positive features of the Programme include its flexibility and adaptability, for example, increasing its focus on nutritional aspects and involvement of the whole family.

One of the main strengths of the Programme was a joint approach to strategy and funding by the local authority and PCT. Nutritional advice was valued by parents, and needs to be more readily accessible, perhaps making up as much as 50% of the content within community programmes like NKP. Schools need to be at the heart of programmes addressing the needs of overweight or obese children.

Evidence from this evaluation indicates that community programmes like those offered in Newtown will have a continuing contribution to make to addressing childhood obesity. Their limitations were acknowledged by service providers and other professionals, particularly their capacity to involve families who did not acknowledge obesity issues, or who did not wish to accept help. More research is urgently needed about engaging these families, and also about effective interventions with ethnic minority communities. Other authorities, like Newtown, will need to develop a more intensive range of interventions for children with the most serious problems.

Some of the most encouraging outcomes from this evaluation have been for the youngest children involved. Recently there has been compelling evidence about the early onset of obesity for infants and very young children (Garner et al, 2009). Large-scale public health preventative programmes tackling the causes of childhood obesity and providing education and support for new parents will be equally, if not more, important than intervention programmes for older children which for many may come too late.

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Full Title: Steps in the right direction, against the odds: An evaluation of a community-based programme aiming to reduce inactivity and improve health and morale in overweight and obese school-age children

Short Title: Steps in the right direction, against the odds

Steps in the Right Direction, Against the Odds

An evaluation of a community-based programme aiming to reduce inactivity and improve health and morale in overweight and obese school-age children

Author Names & Affiliations:

Claire Fraser, Consult Research, Huddersfield

Kiara Lewis, University of Huddersfield

Martin Manby, Nationwide Children's Research Centre, Huddersfield

Corresponding Author:

Claire Fraser, Consult Research

The Media Centre, 7 Northumberland Street, Huddersfield HD1 1RL

Tel: 01484 487986

E-mail: claire@consultresearch.co.uk

Author Biographies:

Claire Fraser is a freelance Research Consultant specialising in research and evaluation with children and families. She set up Consult Research in 2005 after working as Research Fellow at the Universities of York and Huddersfield

Kiara Lewis is a Senior Lecturer in the Division of Health and Fitness at the University of Huddersfield

Martin Manby was director of social services in Greenwich and then in Sheffield between 1982 and 1997. He has been director of the Nationwide Children's Research Centre in Huddersfield since 1998.

Research Sponsor:

The evaluation was funded by Kirklees Council, NHS Kirklees (formerly known as Kirklees PCT) and the Lottery/Sport England

‘Steps in the right direction, against the odds’

Table 1 – Centile Scores for NKP – Baseline

Centile Score	Baseline % (N)
≥ 99.6 th centile (severely obese ¹)	59.5% (116)
≥ 98 th centile (obese)	24.6% (48)
≥ 91 st centile (overweight)	13.8% (27)
‘ 91 st centile (normal weight)	2.1% (4)
Total	100% (195)

¹ As defined in SIGN (2010). *Management of Obesity: Quick Reference Guide*. Scotland: NHS

‘Steps in the right direction, against the odds’

Figure One – Adapted response format for child’s version of Rosenberg self esteem scale

Strongly Agree



Agree



Disagree



Strongly Disagree



Figure Two

Change in Self Esteem Post Intervention

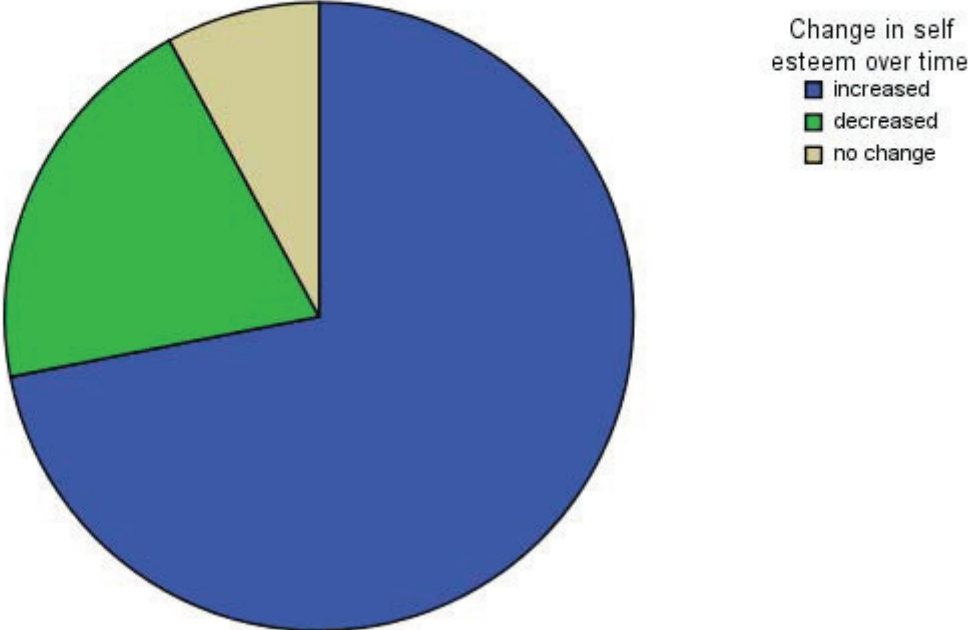


Figure Three

Change in Frequency of Exercise Undertaken

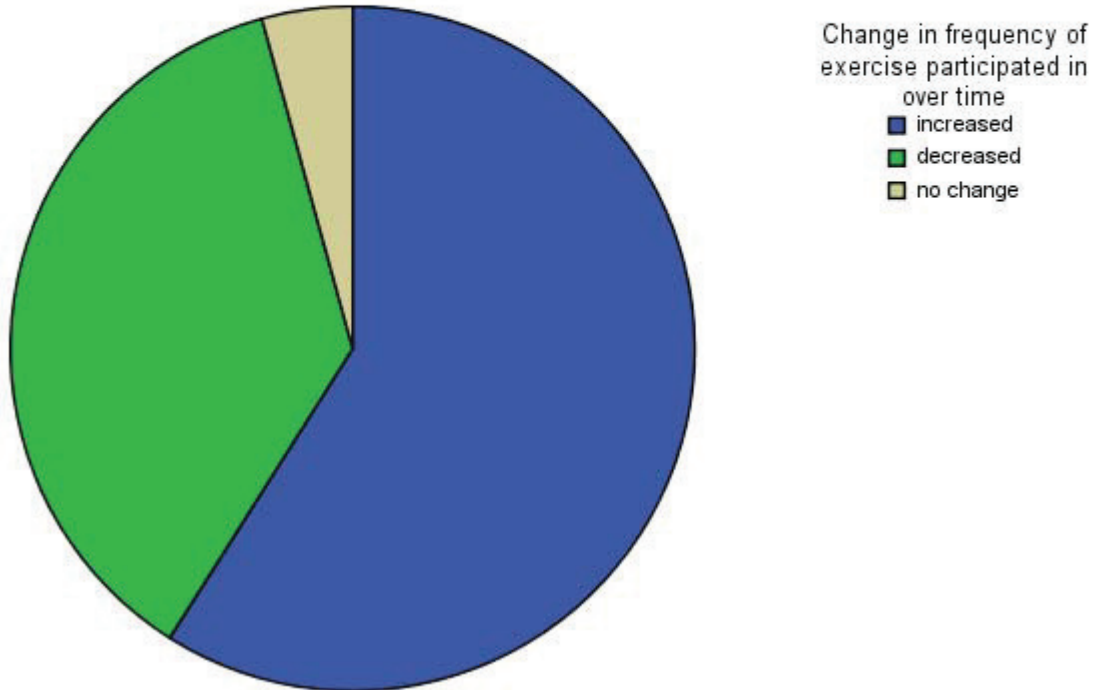


Figure Four

Change in Type (Range) of Exercise Undertaken

