



Durham and Chester-le-Street

MEND Programme Report

2007 – 2010





Durham & Chester-le-Street MEND Report

Generated using post programme measurement data



1. Summary

MEND is a community, family-based programme for overweight and obese children aged between 7 to 13 and their families. The multi-disciplinary programme places equal emphasis on (M)ind, (E)xercise and (N)utrition...Do it! It combines all the elements known to be vital in treating and preventing overweight or obesity in children, including family involvement, practical education in nutrition, increasing physical activity and behavioral change. With an emphasis on practical, fun learning the programme is designed to deliver sustained improvements in families' diets, fitness levels and overall health.

The MEND programmes in Durham and Chester-le-Street are completely free for families to join thanks to funding from the National Lottery through Big Lottery Fund. The programmes are delivered by staff from Durham County Council and County Durham Primary Care Trust.

Nine successful programmes have been delivered to sixty families since July 2007.

Impressive results for the participating children showed an overall reduction of Body Mass Index (BMI) and waist circumference, an increase in exercise each week and a lot less time spent watching TV and in front of the computer. Children also demonstrated an increase in self confidence and improvements in eating habits and nutritional intake.



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2. Portfolio Sites

	Programme Area	Number of participants
1	Chester-le-Street	6
2	Durham City	9
3	Durham City	4
4	Chester-le-Street	9
5	Chester-le-Street/Durham	4
6	Chester-le-Street/Durham	8
7	Chester-le-Street/Durham	6
8	Stanley	7
9	Chester-le-Street	7
10	Total	60

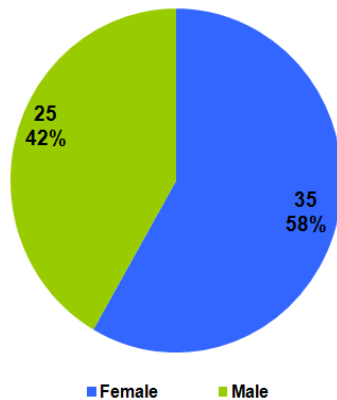
- Programmes' time period: 07/2007 - 12/2010
- Total number of participants¹: 60
- Total number of participants with pre and post programme BMI data: 53 (88% of total)

¹Filters applied

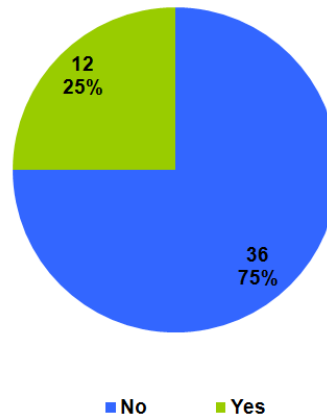
- ✓ Age: 7-13 years old (at pre-programme measurements - Session 1)
- ✓ BMI z-score at baseline > 1.33 (at least overweight i.e. ≥ 91st BMI centile)
- ✓ Non drop-outs (attended > 5/20 sessions)

3. Portfolio's Overview

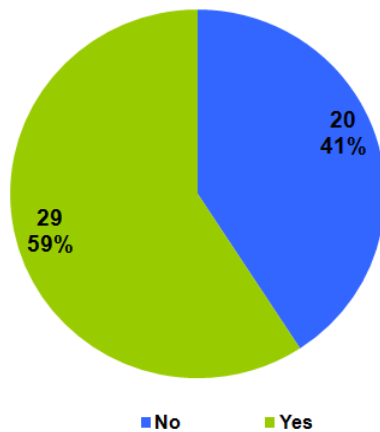
Gender



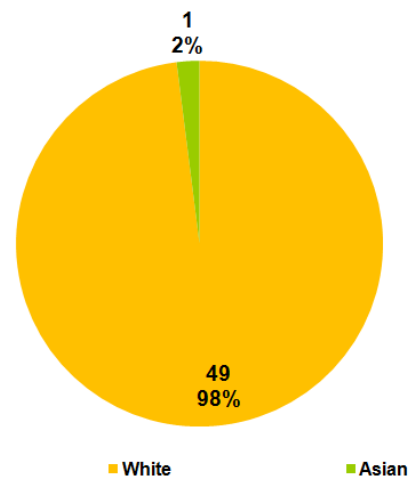
Do you consider yourself a single parent?



Do you own your accommodation?



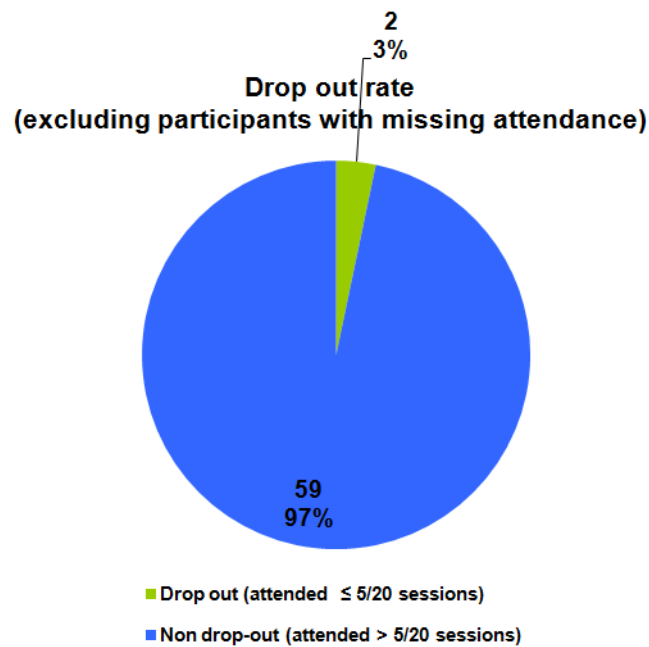
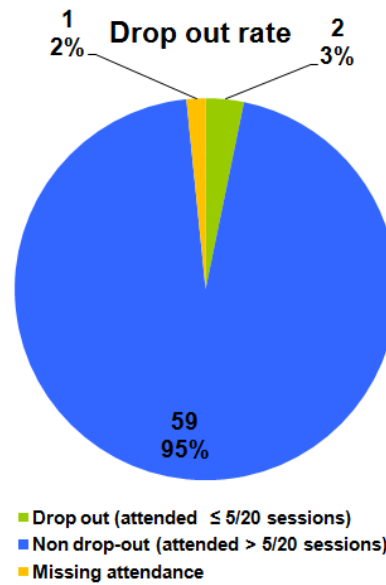
Ethnicity



Figures on the graphs are (n; %)

Missing/Undisclosed data:

- Gender: n = 0
- Single parent: n = 12 (20%)
- Accommodation: n = 11 (18%)
- Ethnicity: n = 10 (17%)



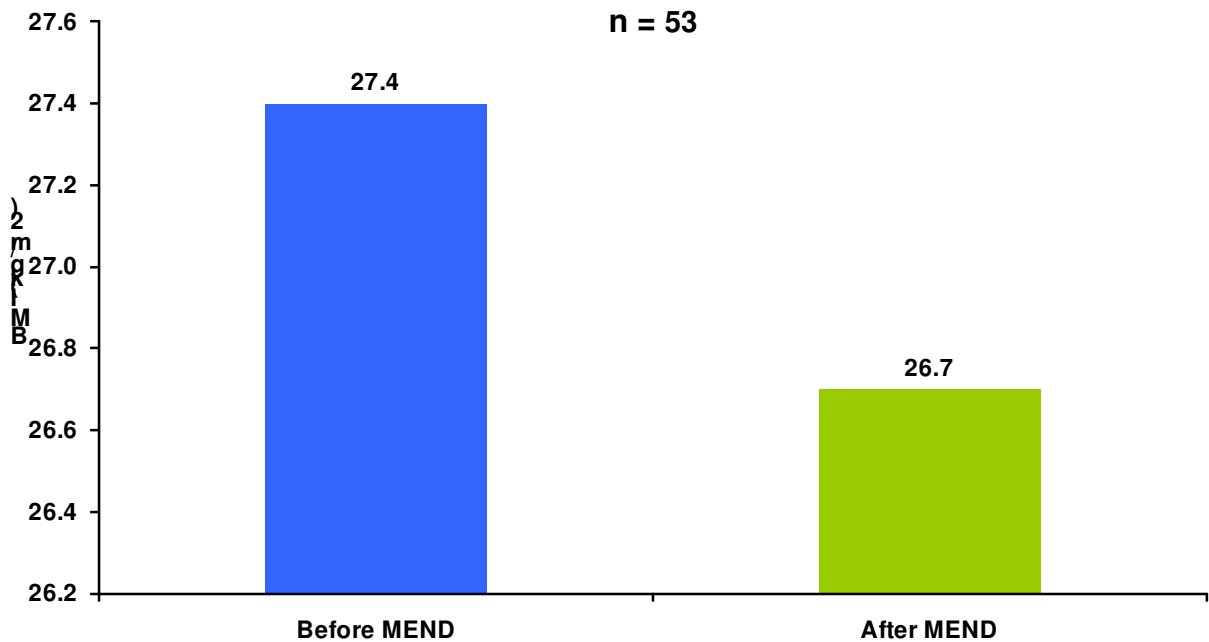
Figures on the graphs are (n; %)

Mean attendance rate was 88%

Mean age for the group: 10.8

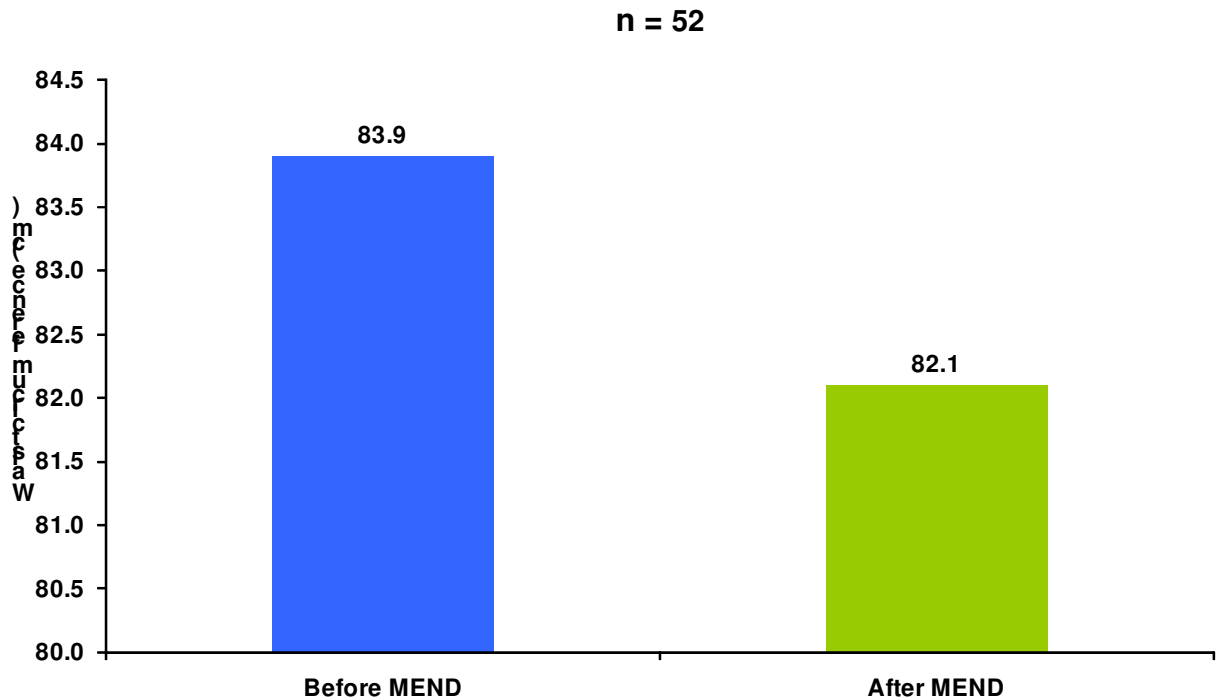
4. Quantitative Results

4.1 Anthropometry



Body Mass Index (BMI) decreased from 27.4 kg/m² pre-MEND 7-13 to 26.7 kg/m² post-MEND 7-13, leading to a 0.7 BMI unit reduction for the Portfolio.

Body Mass Index (BMI) is calculated by dividing weight (in kg) by height (in meters) squared. It is used to categorise individuals as underweight, normal weight, overweight or obese. In clinical practice, the 98th BMI centile for age and gender is used as the cut-off point to define obesity in children. BMI is a valuable tool for initial screening and follow-up as it is easily calculated; however, it does not take into consideration body composition, so it should be ideally complemented by other measures -e.g. waist circumference (see below)- to assess changes in degree of overweight.

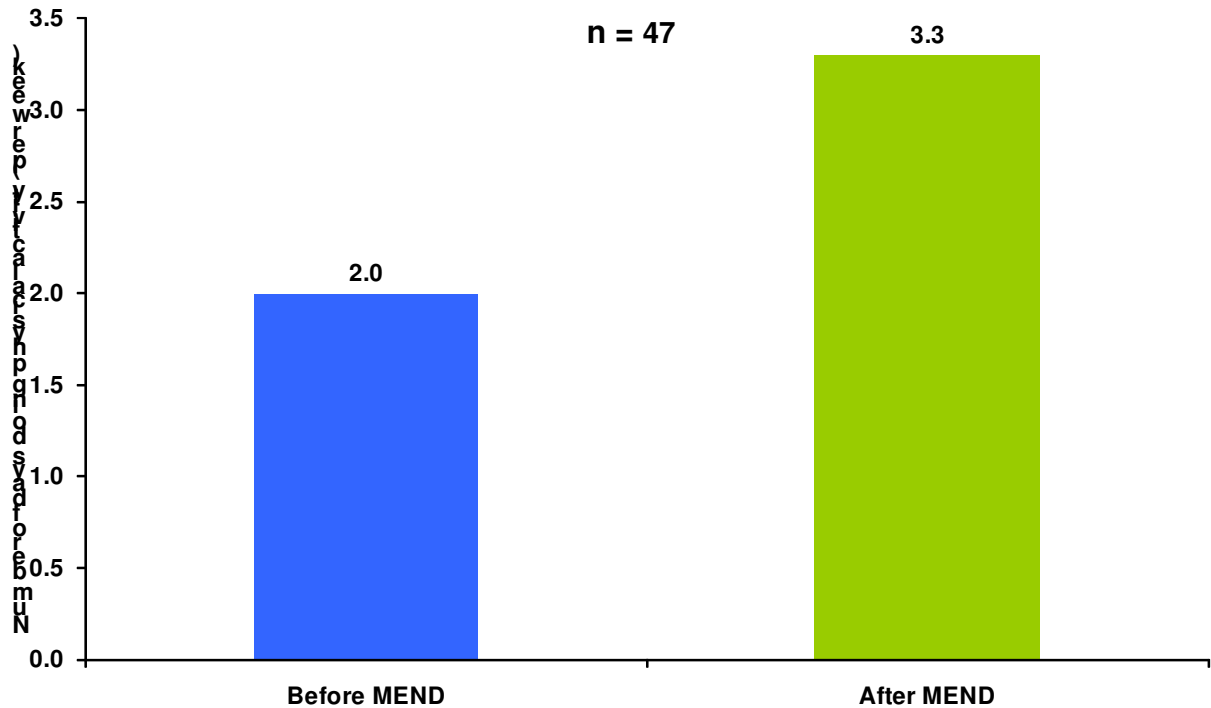


Waist circumference, an indicator of abdominal fat, was decreased by 1.8 cm post-programme for the Portfolio.

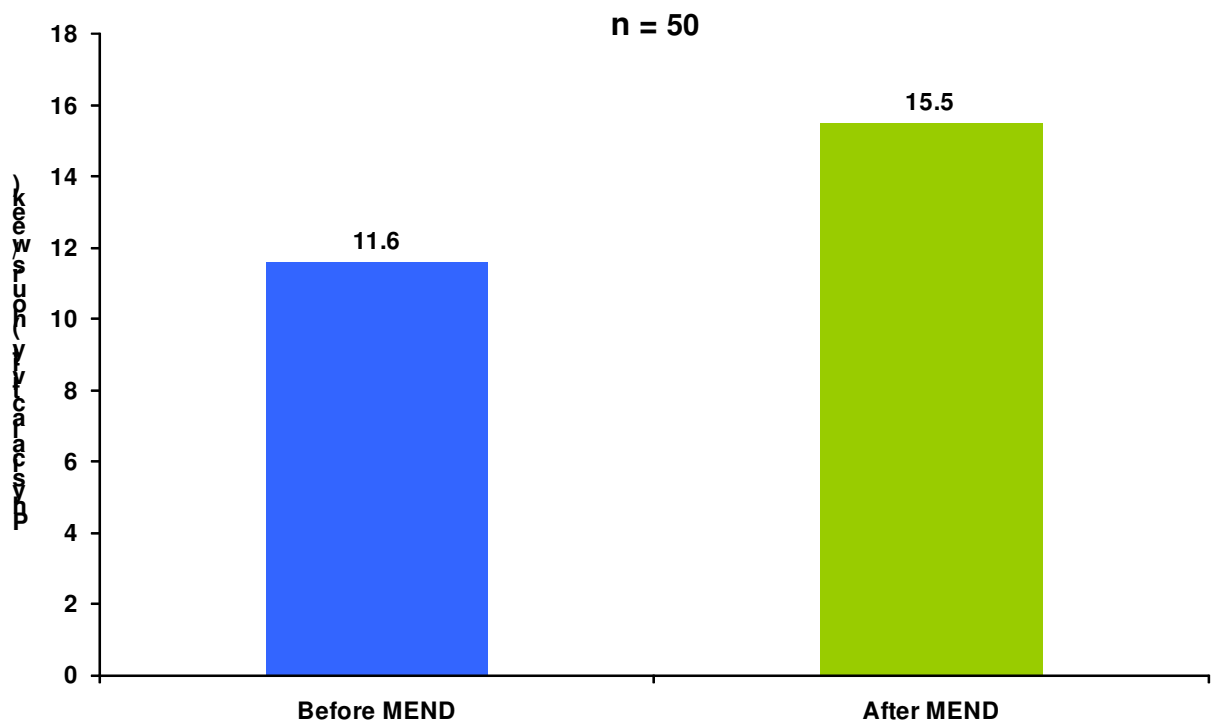
Waist circumference is a measure of abdominal fat, which has been associated with several obesity-related co-morbidities e.g. heart disease and diabetes. Changes in waist circumference are always due to changes in body fat, specifically abdominal fat which is associated with health risk. Waist circumference is a very important measurement as, unlike BMI, it is specifically related to changes in abdominal fat which is reliably related to the health risks of increased weight. Obesity management programmes aim to change the composition of the child's body over the course of development so that muscle mass increases along with a reduction in the level of adipose (fat) tissue. Such changes in the proportions of muscle and adipose over the course of an intervention may mean that BMI is unchanged in children attending MEND 7-13 Programmes. This is why waist circumference is a useful additional measure to examine outcome since it is generally considered more sensitive to changes in body composition. Reductions in waist circumference in the absence of a reduction in BMI will indicate that abdominal fat has been reduced and that health outcomes have been improved.

4.2 Physical activity, sedentary behaviour and fitness

Days spent taking part in 60 minutes of moderate to vigorous physical activity



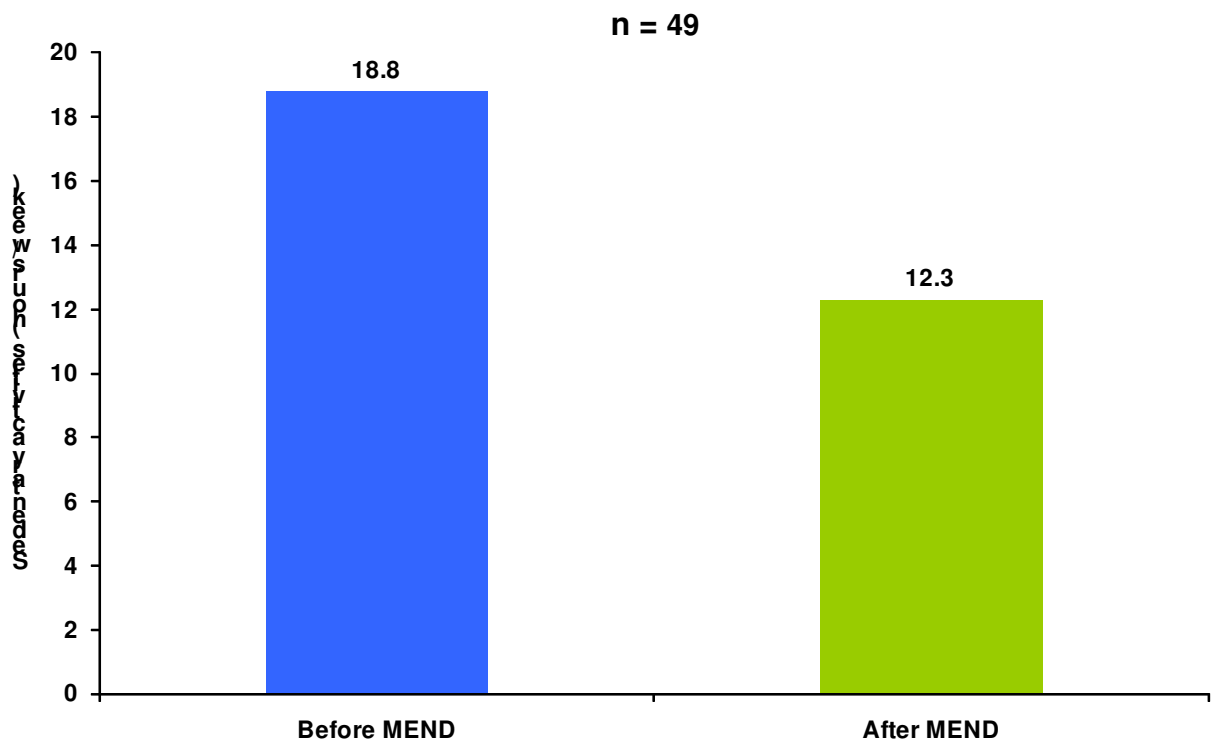
Total time spent in physical activity



Post-MEND 7-13, participants were doing 60 minutes of moderate to vigorous intensity physical activity for 1.3 additional days per week (2.0 days/week pre-programme vs. 3.3 days/week post-programme). The official recommendation for children's physical activity levels is at least one hour of moderate to vigorous physical activity per day. Any increase towards meeting the recommendation is extremely positive.

Additionally, because for obese children this target may be unrealistic, it is important to consider time spent in all levels of physical activity. An average increase of 3.9 hours physical activity per week occurred amongst the total number of MEND 7-13 Participants for this Portfolio (11.6 hours/week pre-MEND 7-13 vs. 15.5 hours/week post-MEND 7-13).

Time spent in sedentary behaviour

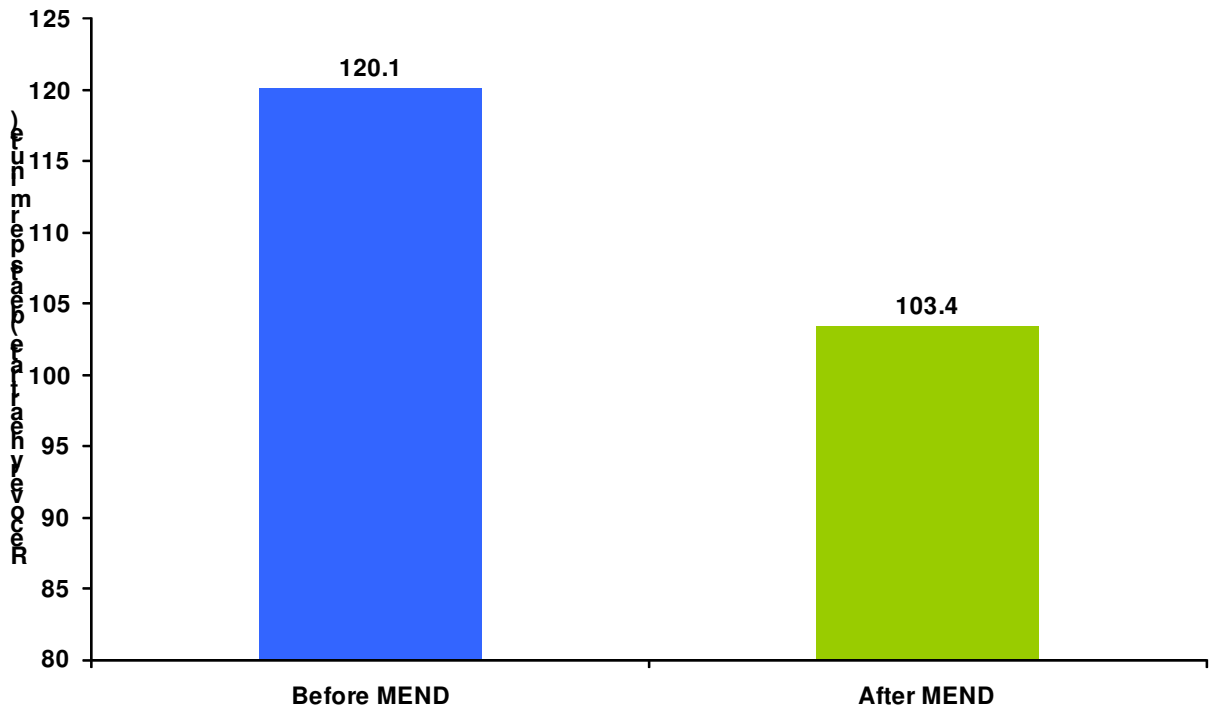


A 6.5-hour decrease in sedentary activities per week was also observed post-MEND 7-13, as television viewing and computer usage were reduced from 18.8 to 12.3 hours per week.

Television viewing has been associated with childhood obesity both directly by promoting sedentary behaviour and indirectly by encouraging the passive over consumption of high-calorie foods and drinks during these activities. The MEND 7-13 Programme focuses on increasing physical activity as well as reducing sedentary behaviour as these independently influences a child's weight status. Both physical activity and sedentary behaviour need to be targeted in any multi-component obesity intervention.

Fitness

n = 53

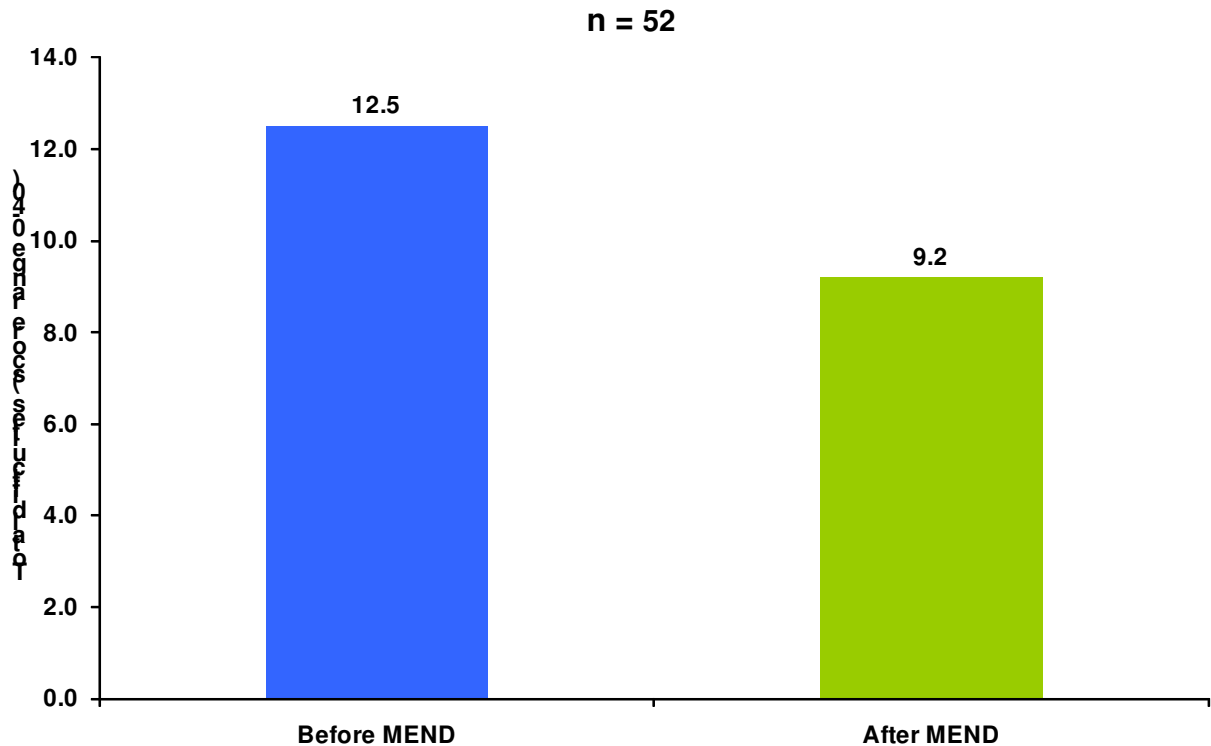


There was a 16.7 beats per minute decrease in recovery heart rate following the 3-minute step test for this group of MEND participants.

The 3-minute YMCA step test is a validated test used to assess fitness levels in children. This is achieved by measuring the recovery heart rate (beats during the minute after the step test). The quicker the heart rate returns to normal levels (resting heart rate) the fitter the child is. Fitness is considered a very important component of children's health. Low fitness is associated with increased risk factors for health problems and it is much easier for a fit overweight child to grow into their weight than an overweight child who is unfit.

4.3 Psychological indices

General psychological well-being (SDQ)



Based on the Strengths and Difficulties questionnaire (SDQ), parents assessed their children as having fewer difficulties (such as hyperactivity, emotional symptoms and peer problems) in their everyday life (score reduction of 3.3 units).

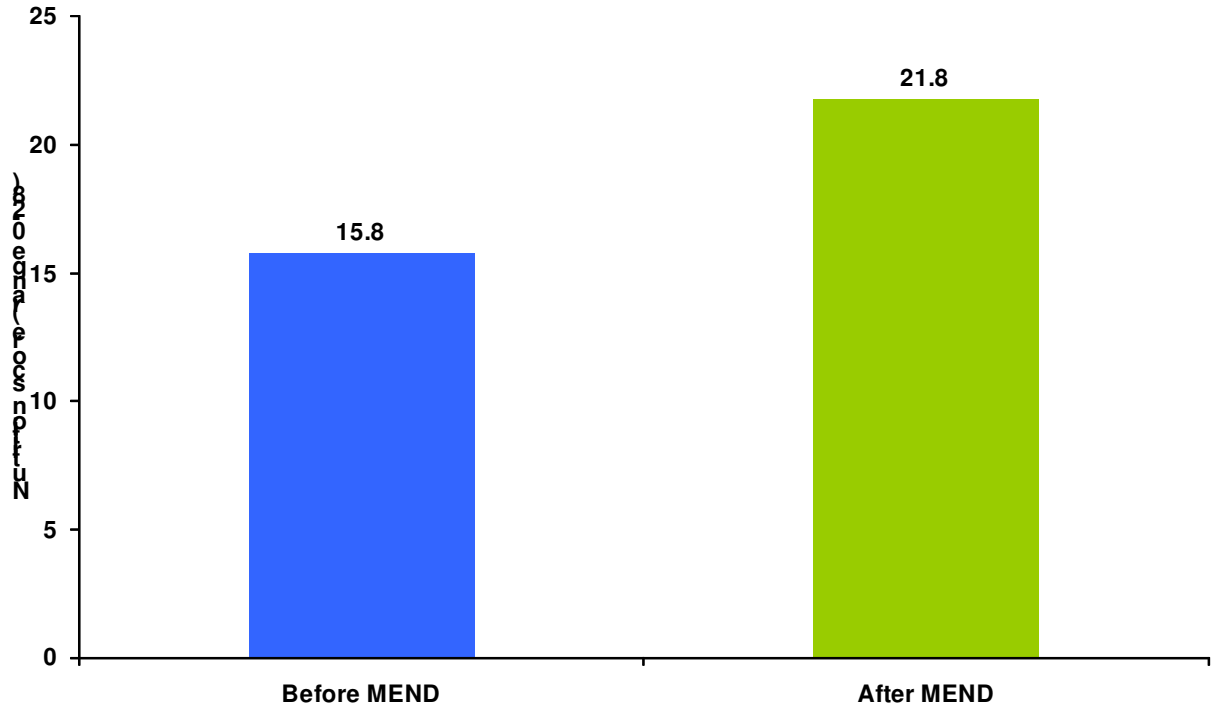
The SDQ is a parent-rated measure of common psychological symptoms in childhood. Scores on the SDQ are categorised according to whether the child has low, borderline or high psychological needs. The ranges for these categories are:

- 0 – 13 Low needs
- 14 – 16 Borderline high/low needs
- 17 – 40 High needs

The mean score on the SDQ was within the low needs range and it is encouraging to note that post-programme the average SDQ score was even lower. This suggests that participating in the MEND 7-13 Programme is associated with improved psychological functioning.

4.4 Dietary habits

$n = 52$



By the end of the Programme, children had a higher nutrition score compared to their pre-MEND 7-13 eating behaviour (15.8 vs. 21.8 out of 28), indicating more MEND-Friendly eating habits.

Throughout the MEND 7-13 Programme, children are taught several MEND-Friendly dietary habits such as eating breakfast daily, drinking 6-8 cups of water per day, choose MEND-Friendly as opposed to MEND-Unfriendly foods (they are given the criteria for food categorisation during the sessions), etc. Increases in MEND-Friendly habits are indicative of substantial improvements in eating habits and nutritional intake.



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5. Appendix: Tables with MEND 7-13 results

5.1 Table of MEND Durham Chester le Street Report Portfolio results

MEND Durham Chester le Street Report Portfolio results									
		Before MEND		After MEND		Difference (Before vs. After MEND)			
	N	Mean	SD	Mean	SD	Mean	Lower CI	Upper CI	p-value
BMI (kg/m ²)	53	27.4	3.3	26.7	3.2	-0.7	-0.9	-0.5	< 0.0001
Waist circumference (cm)	52	83.9	9.0	82.1	9.4	-1.8	-2.8	-0.9	< 0.0001
Days doing physical activity (per week)	47	2.0	1.6	3.3	1.6	1.3	0.8	1.8	< 0.0001
Physical activity (hours/week)	50	11.6	7.7	15.5	6.8	3.9	1.9	5.9	< 0.0001
Sedentary activities (hours/week)	49	18.8	11.8	12.3	7.3	-6.5	-9.8	-3.2	< 0.0001
Recovery heart rate (beats per minute)	53	120.1	24.9	103.4	20.3	-16.7	-21.4	-11.9	< 0.0001
Total difficulties score (0-40)	52	12.5	6.7	9.2	5.5	-3.3	-4.6	-2.2	< 0.0001
Nutrition score (0-28)	52	15.8	4.7	21.8	4.7	6.0	4.4	7.4	< 0.0001
Attendance (%) ¹	59	87.7	15.7						
Drop outs (%) ²	2	3%							

BMI: Body Mass Index

CI: Confidence Interval

SD: Standard Deviation

p < 0.05 means that the difference is statistically significant

N: number of children

¹ Excluding drop-outs, non-starters or children with missing attendance

² Excluding non-starters or children with missing attendance



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5.2 Tables of MEND's Published National Roll-out results

MEND 7-13 National Roll-out 3-month results									
	N	Before MEND		After MEND		Difference (Before vs. After MEND)			
		Mean	SD	Mean	SD	Mean	Lower CI	Upper CI	p-value
BMI (kg/m ²)	6815	27.4	4	26.6	4.5	-0.8	-0.8	-0.8	<0.0001
Waist circumference (cm)	6636	86.8	11.6	84.1	11.5	-2.7	-2.8	-2.6	<0.0001
Days doing physical activity (per week)	5025	1.4	1.6	2.8	1.7	1.3	1.3	1.4	<0.0001
Physical activity (hours/week)	5557	10.9	7.2	14.7	8	3.8	3.5	4	<0.0001
Sedentary activities (days/week)	5641	16.9	11	10.7	7.6	-6.2	-6.4	-5.9	<0.0001
Recovery heart rate (beats per minute)	5984	110.2	21.6	101.1	20.6	-9.1	-9.6	-8.6	<0.0001
Total difficulties score (0-40)	5654	13.4	6.9	10.2	6.4	-3.2	-3.4	-3.1	<0.0001
Nutrition score (0-28)	5728	16.6	4.4	23.2	3.7	6.5	6.4	6.6	<0.0001
Attendance (%) ¹	6566	78.3	20.3						
Drop outs (%) ²	977	13							

BMI: Body Mass Index

CI: Confidence Interval

SD: Standard Deviation

p < 0.05 means that the difference is statistically significant

N: number of children

¹ Excluding drop-outs, non-starters or children with missing attendance

² Excluding non-starters or children with missing attendance

Reference: Sacher PM, Chadwick P, Kolotourou M, Radley D, Cole TJ, Lawson M, Lucas A, Singhal A. Effectiveness of the MEND Program in the community: UK national data (2007-2009). *In Press*



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5.3 Table of MEND's Published Research results

MEND 7-13 Research results									
		Before MEND		After MEND		Difference (Before vs. After MEND)			
	N	Mean	SD	Mean	SD	Mean	Lower CI	Upper CI	p-value
BMI (kg/m ²)	47	27.1	3.3	26.1	3.4	-0.9	0.7	1.1	<0.0001
Waist circumference (cm)	47	81.4	7.8	78.5	8.1	-2.9	2.3	3.6	<0.0001
Days doing physical activity (per week)	n/a								
Physical activity (hours/week)	47	7.1	4	12.7	5	5.6	-7.2	-4	<0.0001
Sedentary activities (hours/week)	47	20.6	9.2	17.9	7	-2.6	0.3	5	0
Recovery heart rate (beats per minute)	44	114	28.3	98.1	19.4	-15.8	6	25.6	0.002
Total difficulties score (0-40)	n/a								
Nutrition score (0-28)	n/a								
Attendance (%)	47	86							
Drop outs (%)	1	2							

BMI: Body Mass Index

CI: Confidence Interval

SD: Standard Deviation

p < 0.05 means that the difference is statistically significant

N: number of children

Reference: Sacher PM, Kolotourou M, Chadwick P, Cole TJ, Lawson M, Lucas A, Singhal A. Randomized controlled trial of the MEND Program: a family-based community intervention for childhood obesity. Obesity. (2010). In Press.



6. Executive summary

The current portfolio included 9 programmes over a period of 41 months. The total number of participants in these programmes was 60 (42 % boys) and the average age was 10.8 years.

Average programme attendance rate was higher than the national average (88%) and drop-out rate was lower than the national average (3%). On the whole, most of the results are similar to the MEND 7-13 national roll-out results.

In the current Durham and Chester le Street Report Portfolio, MEND 7-13 has demonstrated significant clinical results with Body Mass Index (BMI) decreasing from 27.4 kg/m² pre-MEND 7-13 to 26.7 kg/m² post-MEND 7-13, leading to a mean 0.7 BMI unit reduction. Also, waist circumference, an indicator of abdominal fat, was decreased by 1.8 cm post-programme for the Portfolio.

Post-programme levels of physical activity rose and children were doing moderate to vigorous activity for 1.3 additional days per week, whilst a 6.5-hour decrease in sedentary activities per week was also observed post-MEND 7-13, as television viewing and computer usage were reduced from 18.8 to 12.3 hours per week.

The Durham and Chester le Street Report MEND 7-13 Portfolio not only demonstrated "clinical attributes" that participants became healthier, MEND 7-13 Participants were also "fitter" by the end of the programme, as indicated by the 16.7 beats per minute decrease in recovery heart rate following the 3-minute step test.

Finally, the MEND 7-13 Programme had a positive impact on the mental wellbeing of the participants. The SDQ is a parent-rated measure of common psychological symptoms in childhood. The mean score on the SDQ was within the low needs range and it is encouraging to note that post-programme the average SDQ score was even lower. This suggests that participating in the MEND 7-13 Programme is associated with improved psychological functioning.

Taken together, the results of this report indicate that the MEND 7-13 Programme is having positive healthy outcomes for the families participating in those programmes within the Durham and Chester le Street area.

In line with the recommendations of the National Obesity Observatory, MEND 7-13 strongly recommends that sites in this portfolio continue to monitor the anthropometric outcomes of the children who took part in these programmes for a further 12 months.