

# Lincolnshire Exercise Referral Evaluation Research

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On behalf of:



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## Exercise Referral Evaluation Research

### 1. Evaluation Overview and Methods

The following evaluation research examined the data for patients who were referred for obesity by Lincolnshire Sport and Public Health Lincolnshire.

The purpose was to examine data for patients attending Lincolnshire's Exercise Referral (ER) Programme over a 12 months period.

The analysis was in response to questions that had been identified by Lincolnshire Sport and Public Health Lincolnshire. The questions considered BMI changes in relation to the following:

- Attendance over a 12 months period.
- Age and gender.
- Starting BMI category.
- Reason for referral.

Relevant data were accessed via Lincolnshire Sport's parachute system and were analysed via calculation of descriptive statistics (i.e. percentages; means  $\pm$  standard deviations).

The data spanned a period of 3 years and included patients in the database who started a 12-week ER programme between 26<sup>th</sup> July 2010 through to 10<sup>th</sup> July 2013, and attended the first (week 1), second (week 12) and none or more of the following three visits (6, 9 and 12 months).

There were 3745 eligible patients, of which 7.5% (281) had data for each of the 5 visits. The data is presented for all 3745 patients.

## Key Findings

### 1.1. BMI Changes Over a 12 months Period

It was of interest to establish how BMI changed over 12 months for those who continued to attend beyond the 12 week referral period.

There was a progressive decline in BMI over the 12 months. This was a difference of 1.3 kg/m<sup>2</sup> from the initial measure at week 1 through to the 12 months assessment (Figure 1.a). The biggest decline (0.7 kg/m<sup>2</sup>) occurred between the initial pre and post 12 week assessment, which can be seen more clearly in Table 1.a. It should be noted however that over this period of time there was a reduction in sample size, which was due to a decrease in the number of recorded measures held for each patient.

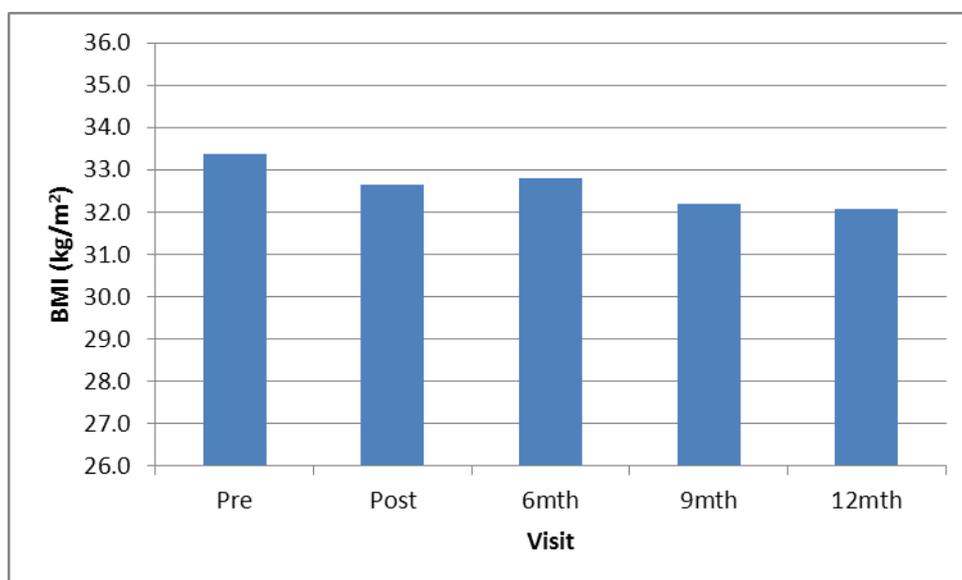


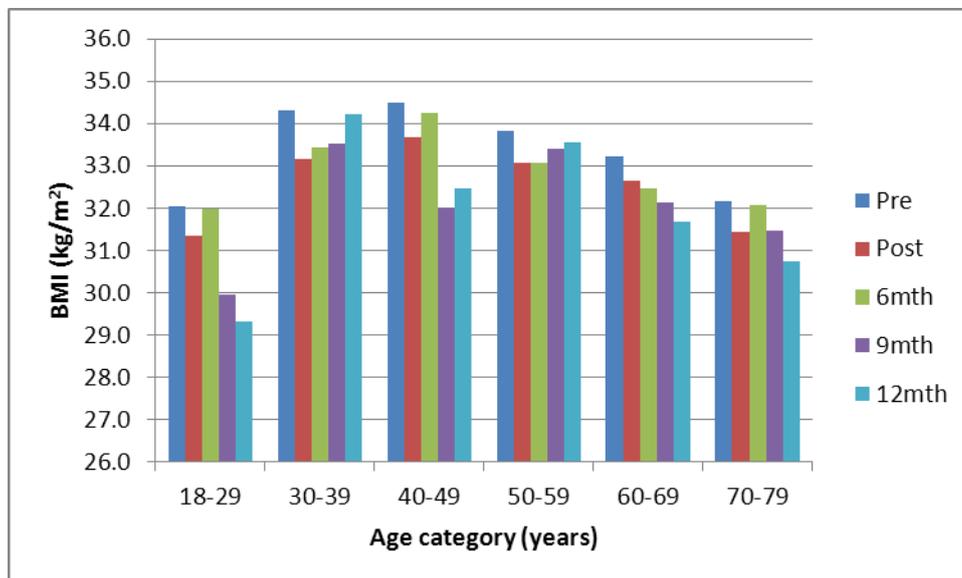
Figure 1.a Patient BMI changes pre to post 12-weeks, 6, 9 and 12 months ER programme.

Table 1.a Patient BMI data pre to post 12-week, 6-, 9- and 12 months ER programme.

	Pre	12 weeks	6 months	9 months	12 months
BMI (kg/m <sup>2</sup> )	33.4 ± 6.9	32.7 ± 6.6	32.8 ± 7.1	32.2 ± 6.6	32.1 ± 6.6
n	3698	3281	1035	666	468

## 1.2. BMI Changes in Relation to Age and Gender

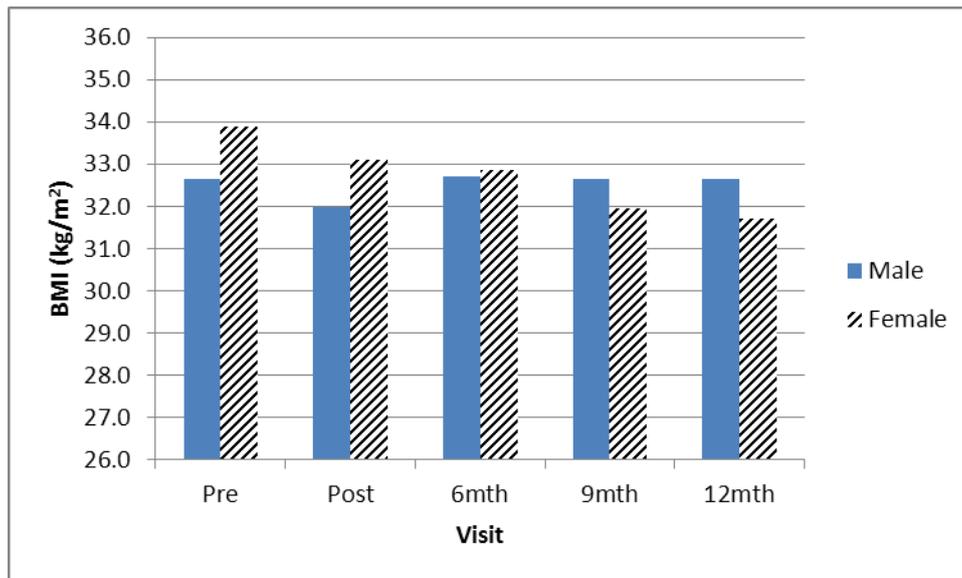
As ER is available to any patient aged 18 years or above, it was considered relevant to determine the changes in BMI in relation to the age of patients, over the 12 months period.



**Figure 1.b BMI changes in relation to age over a 12 months period.**

The highest BMI was at the pre ER visit, and within every age group BMI reduced over 12 months (Table 1.a Figure 1.b). BMI did fluctuate at visits between the pre and 12 month visit. For the 6 age groups, the lowest BMI was at 6 or 12 months for 4 groups. For the other 2 groups (30-39 and 50-59 years), in contrast, the highest BMI (other than the pre visit) was at 12 months.

Gender was also considered in terms of who presented the biggest changes in BMI score. Both male and females initially demonstrated a decrease in BMI after the 12 week ER programme (Figure 1.c). Females maintained a decline in BMI over each of the subsequent visits, with a difference of 2.2 kg/m<sup>2</sup> over the year (Table 1.b). Males, however, at 6, 9 and 12 months returned to pre-ER BMI scores. Females initially had higher BMI scores than males, but this situation reversed with males having higher BMI scores at 12 months.



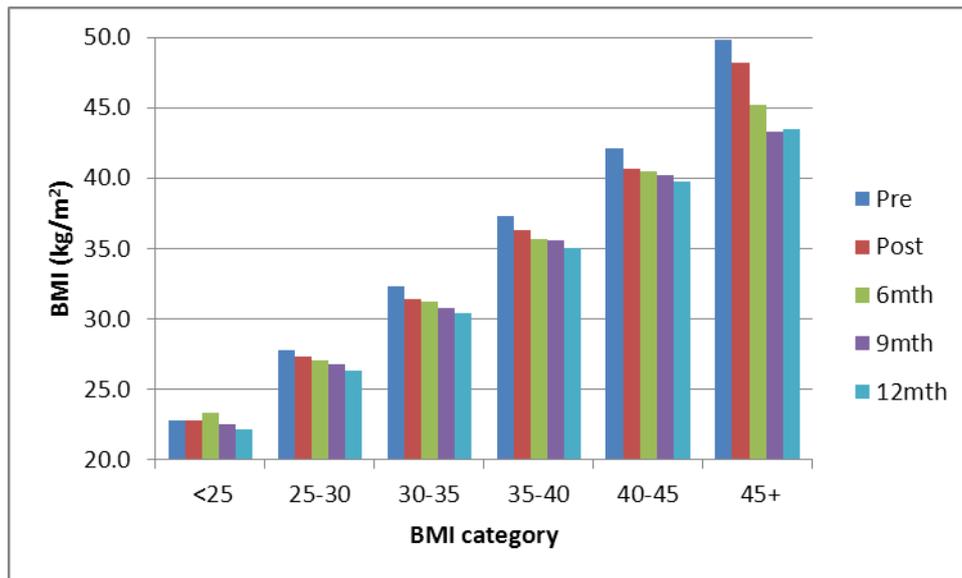
**Figure 1.c BMI changes in relation to gender.**

**Table 1.b BMI changes in relation to gender.**

BMI ( kg/m <sup>2</sup> )	Pre	12 weeks	6 months	9 months	12 months
<b>Male</b>	32.6 ± 6.7	32.0 ± 6.3	32.7 ± 7.2	32.7 ± 6.8	32.6 ± 6.9
<b>Female</b>	33.9 ± 6.9	33.1 ± 6.7	32.9 ± 7.1	31.9 ± 6.4	31.7 ± 6.4

### 1.3. BMI Changes in Relation to Starting BMI Category

When assessing obesity, patient's BMI is calculated and categorised according to healthy, overweight, obese and morbidly obese. There is a consideration that a patient's starting BMI category may relate to their future weight loss and their resulting BMI category.



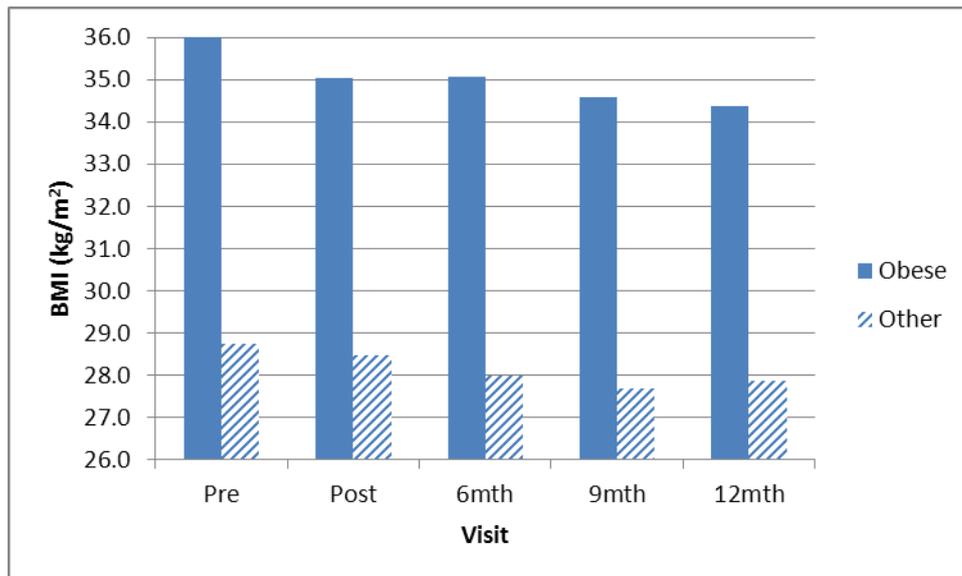
**Figure 1.d BMI changes in relation to a patient’s starting BMI category.**

For any patient, regardless of BMI category, a decrease was observed across the year (Figure 1.d). The biggest decrease applied to those patients in the morbidly obese category (40+) who saw an overall decrease of either 2.4 kg/m<sup>2</sup> (40-45) or 6.4 kg/m<sup>2</sup> (45+) over the 12 months.

#### **1.4. BMI Changes in Relation to Reason for Referral**

When patients are referred to the ER programme, the health practitioner will indicate a primary and if appropriate secondary reason for making the referral. There is no priority necessarily between the primary and secondary reason, it is merely an opportunity to identify multiple reasons for referring the patient. For patients who are not referred for obesity, there is still the chance they will lose weight as a result of engaging with exercise although it was deemed important to determine whether referral was more successful for those patients referred specifically for obesity (presumably with the intention help patients’ lose weight).

Regardless of the reason for referral, a decrease in BMI was observed (Figure 1.e). For those patients who were not referred for obesity an overall decrease of 0.8 kg/m<sup>2</sup> was measured over 12 months. For those patients referred for obesity (primary or secondary reason) a greater decrease of 1.7 kg/m<sup>2</sup> was observed over the year.



**Figure 1.e BMI Changes in relation to reason for referral.**

## 2. Summary

The purpose of this evaluation was to examine the data compiled by Lincolnshire's ER programmes in relation to clearly defined questions about BMI changes. The primary findings in relation to each question can be summarised as the following:

- There was a progressive decline in BMI from the initial measure at week 1 through to the 12 month assessment.
- Within every age group BMI reduced over 12 months, in comparison to the pre ER visit. This trend was also observed specifically for females however male BMI scores saw an increase from 6 months onwards returning to pre ER BMI values.
- A decrease in BMI was observed for all patients, regardless of BMI category, however the biggest decrease applied to those patients in the morbidly obese category (40+).
- A decrease in BMI was observed regardless of the reason for referral; however a greater decrease was seen for those patients referred for obesity.