An Evaluation of the Northumberland Exercise on Referral Scheme: Preliminary Results on Predicting Dropout for Overweight and Obese Referrals

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Introduction

National figures for England estimate that 24.2% of the adult population is obese. In Northumberland, this figure is estimated to be 27.3%[1]. Exercise on Referral schemes (ERS) have existed since the early 1990s, having emerged as one way for primary care professionals to promote physical activity for patients with conditions such as cardiovascular disease (CVD) or who are overweight/obese[2]. In Northumberland the referral pathway is from primary care to local leisure facilities and comprises three consultations with an exercise specialist (entry, 3 and 6 months) and 24 weeks of supervised physical activity. The aim of the present study was to evaluate the relationship between entry BMI, referral for overweight/obesity and exit stage and whether completion resulted in changes to BMI and waist circumference.

Method

Demographic factors, attendance and physiological data were recorded from 2233 referrals made to the scheme from July 2009-Oct 2010 [mean age 53.0 years (SD 18.9); initial BMI 32.8 (SD 7.1) kg/m^2 ; 59% female, 41% male]. Referrals were classified according to point of exit along a four stage timeline detailed in Table 1.

Table 1: Classification of Stage of Exit

Stage of Exit	Definition
1	Did not take up scheme (did not attend entry assessment or was excluded at first assessment as not meeting referral criteria)
2	Attended entry assessment, was admitted to the scheme but dropped out before 3 month assessment
3	Dropped out between 3 and 6 month assessment
4	Attended 6 month assessment and completed the scheme

Reason for referral was recorded from the referral form. BMI and waist circumference were recorded at entry and final consultations. One way ANOVA and regression were used to examine differences in exit stage between entry BMI groups and reason for referral categories. Paired samples t-tests were used to examine whether completing the scheme led to changes in BMI and waist circumference. Entry BMI and reason for referral are shown in Table 2. Entry BMI data were not available for those people exiting the scheme at stage 1.

Table 2: Entry BMI and Reason for Referral

BMI (kg/m^2) % (n)		Primary Reason for Referral % (n)	
<18.5	0.4% (10)	CVD	29% (649)
18.5-24.9	9.3% (206)	Overweight/Obesity	40.9% (913)
25-29.9	20.7% (462)	Mental Health	13.3% (297)
30-34.9	22.5% (503)	Metabolic/Endocrine	6.7% (149)
35-39.9	13.9% (310)	Respiratory	2.8% (63)
40-44.9	8.3% (185)	Neurological	1.2% (26)
45-49.9	3.4% (76)	Musculoskeletal	2.9% (64)
50+	1.5% (34)	Other	0.3% (6)
Not Recorded	20% (447)	No Reason Given	2.9% (66)

Results and Discussion

19% (n=425) of referrals never attended the Northumberland ERS or were excluded at entry consultation. Of those who attended the entry consultation and were admitted to the scheme, 53.5% (n=968) attended the 3 month consultation and 43% (n=776) attended the 6 month consultation. Uptake, adherence and completion are shown in Table 3:

Table 3: Uptake, 3 Month Adherence and Completion

	Total Number	% of Total Number of Referrals	% of Uptake
Number of Referrals	2233	100	
Uptake	1808	81.0	100
3 Month Adherers	968	43.3	53.5
Completers	776	34.8	43.0

Table 4: Differences in Exit Stage across Entry BMI Groups

Entry BMI (n=1786)								
	<18.5	18.5-24.9	25-29.9	30-34.9	35-39.9	40-44.9	45-49.9	50+
n	9	207	462	503	310	185	76	34
Mean Stage of Exit (SD)	3.22 (0.97)	3.11 (0.95)	3.07a (0.97)	2.95 (0.95)	2.94 (0.95)	2.76a (0.93)	2.68 (0.90)	2.97 (0.95)

*F (7, 1778) = 4.03, p<0.05 *Values that share the same letter are significantly different*

Table 5: Differences in Exit Stage by Primary Reason for Referral

Primary Reason for Referral (n= 2233)									
	No Reason Given	Cardiovascular Disease	Overweight/ Obesity	Mental Health	Metabolic/ Endocrine	Respiratory	Neurological	Musculoskeletal	Other
n	66	649	913	297	149	63	26	64	6
Mean Stage of Exit (SD)	2.48 (1.14)	2.89ab (1.16)	2.46a (1.12)	2.30b (1.11)	2.51 (1.12)	2.78 (1.10)	2.73 (1.15)	2.81 (0.99)	2.83 (1.33)

F (8, 2224) = 10.44, p<0.001 Values that share the same letter are significantly different

From Table 5 it can be seen that those who are referred primarily for overweight/obesity are more likely to drop out than those referred for CVD. Other studies[3, 4] have also found that those referred to ERS for cardiovascular disease were more likely to complete than those referred for other reasons.

When other demographic factors (age, gender, IMD decile, employment status, secondary reason for referral, profession of referrer and leisure site) were controlled for, entry BMI was not a predictor of exit stage (p>0.5). However after controlling for other factors (age, gender, IMD decile, employment status, entry BMI, secondary reason for referral, profession of referrer and leisure site), primary reason for referral remained a predictor of completion (p<0.05).

Tables 6 shows that for completers, there were small mean decreases in BMI (0.3 kg/m^2) and waist circumference (2.2 cm) were seen between entry and completion measurements, however these were statistically significant (p<0.001).

Table 6: Changes in BMI and Waist Circumference for Completers

	Pre Scheme	Six Months	t Value	Sig.
Mean BMI (SD) (n=767)	31.8 kg/m^2 (6.9)	31.5 kg/m^2 (7.0)	t (767) = 3.56	p<0.001
Mean Waist Circumference (SD) (n=766)	106.2 cm (17.1)	104.0 cm (16.7)	t (766) = 10.1	p<0.001

Conclusions and Recommendations

Results from this study indicate that the entry BMI is not a predictor of completion for the Northumberland ERS

Those referred primarily due to overweight/obesity were significantly less likely to complete the scheme compared to those referred due to CVD.

There were small but significant changes in both BMI and waist circumference for those who completed the scheme.

This data is part of a larger quantitative evaluation of the Northumberland ERS and a more complete analysis will allow for a greater understanding of factors influencing dropout.

Future qualitative work is required to understand the potential barriers for overweight/obese referrals and why those referred for CVD are more likely to adhere.

References

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