

**PENNYGATE MEDICAL CENTRE
AUDIT OF OBESITY
MANAGEMENT SERVICE**

**EXERCISE ON
PRESCRIPTION: AN OBESITY
MANAGEMENT SCHEME**

An Audit – Pennygate Medical Centre
8th May 2009



09

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ABSTRACT

Physical inactivity is an important modern day public health problem which has the potential to be addressed and treated by various health promotion initiatives set up within primary healthcare centres, for example, general practices. This paper evaluates the success of such an initiative – the ‘Obesity Management Scheme’ which was set up at Pennygate Medical Centre. The audit involved a cohort of 100 members and looked at numerous criteria, both subjective and objective, including changes in mood, changes in use of anti-depressants and changes in cardiovascular disease (CVD) risk factors. Obesity and physical inactivity are costly both to the health of a patient as well as in time and monetary terms to the National Healthcare Service (NHS) and so treatment of these problems would save time, money and distress for all concerned. Medical and surgical interventions are developed all the time for all conditions and diseases, so perhaps exercise which is a perfectly viable and suitable treatment should now be prescribed for these ailments.

INTRODUCTION

Obesity and physical inactivity are said to be the biggest public health problems of the 21st century, a direct consequence of our modern sedentary lifestyles in this industrialised era.¹ This global problem is well recognized, with more than 1 billion adults overweight and at least 300 million classified as clinically obese.^{2,3}

People who are physically active have a lower risk (by up to 50%) of developing major chronic diseases including coronary heart disease, stroke and diabetes type 2 and also a reduced risk (a third less) of suffering from premature death. The annual costs of physical inactivity in England are estimated at £8.2 billion considering the rising costs of treating chronic diseases such as coronary heart disease and diabetes. This large sum does not include the role of inactivity to obesity which is thought to cost a further £2.5 billion each year.³

Further to the morbidities mentioned regular exercise also encourages an increase in bone density to protect against osteoporosis, reduces the overall risk of cancer, increases levels of

¹ Blair S N. Physical inactivity: the biggest public health problem of the 21st century; Br J Sports Med January 2009, 43 (1): 1-2

² Anandacoomarasamy A, Fransen M, March L. Obesity and the musculoskeletal system. [Review], Current Opinion in Rheumatology January 2009. 21(1): 71-7

³ Evidence on the impact of physical activity and its relationship to health. A report from the Chief Medical Officer. Department of Health, At least five a week: April 2004. www.dh.gov.uk, accessed 29/04/2009

HDL and lowers high blood pressure which would reduce the risk of developing heart disease and boosts the immune system. Exercise can also improve self-confidence and help prevent depression and when combined with a balanced diet, help to maintain a healthy weight. There is now substantial evidence showing that regular physical activity has a wide variety of important health benefits which in turn reduces the burden on the NHS by lowering morbidity and mortality rates.^{3,4}

A recent accelerometer study which allowed physical activity to be objectively studied showed that adults on average use half their waking hours participating in sedentary activities, for example, sitting. Only 4-5% of an average day was found to be used for moderate or vigorous physical activity. Research shows such a sedentary lifestyle to be damaging to an individual's health as it promotes the development of various chronic diseases. Therefore it appears to be logical that exercise should be a prescribed element if members of the public are unable to independently make this lifestyle change.^{5,6}

WHAT IS THE EXERCISE SCHEME

Physical inactivity and obesity have long since been seen as problems and so governmental interventions and schemes have been developed to battle this pandemic. 'Game Plan' was a strategy, released in 2002, developed to reach Government's sport and physical activity objectives. This placed a major focus on the health gains that could be achieved through increased physical activity. The Activity Coordination Team was then set up in 2003 to address these problems. In March 2004 the government released a paper on public health signalling a new dedication and focus on these issues. Already there is significant investment at national and local levels with many schemes being established. For example, there is heavy investment occurring in improving physical education and school sport to increase opportunities for 5-16 year olds in schools. Also nationally there has been governmental support to increase cycling and walking which will contribute to an environment that promotes, rather than inhibits, physical activity. There is now recognition of the importance of physical activity for good health highlighted in the National Service Frameworks for the NHS.³

Pennygate Medical Centre, Wigan recognised a local need that was not being met by current medical care provisions i.e. encouraging and assisting physical activity and so designed and created the 'Obesity Management Scheme'. This scheme was initially designed to act as a weight

⁴ www.hcd2.bupa.co.uk/fact_sheets/html/exercise.html#9 accessed 01/05/2009

⁵ Healy GN, Dunstan DW, Salmon J et al. Objectively measured light-intensity physical activity is independently associated with 2-h plasma glucose. *Diabetes Care* 2007; 30: 1384-9

⁶ Owen O, Bauman A, W Brown. Too much sitting: a novel and important predictor of chronic disease risk. *Br J Sports Med*, February 2009 43 (2): 81-83

loss service operating twice a week for two hour sessions consisting of an hour's healthy eating and lifestyle advice session and an hour long exercise class. The service could accommodate eighty patients over the two evenings. The demand for such a scheme was illustrated by the identification of 1051 patients with a BMI of over thirty or above. The scheme then started to include those with a BMI of over twenty-five with a co-morbidity and also those where exercise would aid existing medical diagnoses, for example, anxiety, depression and arthralgia. Patients were selected by doctors and nurses within the medical practice who came in to contact with them. Those selected were those who would not necessarily have the access or the motivation to do physical activity otherwise. Also these patients would not have the self-esteem or confidence to utilise other local facilities where other people with much higher levels of fitness attend. It was also found that patients' poor self-image inhibited them attending other facilities. This therefore made the Pennygate Medical Centre Service unique within the borough of Ashton, Leigh and Wigan, with no comparable service identified. The scheme aimed to lower obesity levels within the area, improve diet and nutrition of patients, promote a higher standard of obesity management within the medical care teams and raise awareness of the health problems faced by the obese population. The success of the scheme would close the gap in life expectancy experienced (as obesity is associated with chronic illnesses) by those in this area of lower socio-economic status and reduce the number of deaths caused by diabetes, congestive heart disease and cancer etc.

AUDIT

AIM

This paper will evaluate the efficacy of an obesity management scheme – a mode of exercise on prescription at a general practice, Pennygate Medical Centre. In this report I will also demonstrate an understanding of this exercise on prescription scheme and the benefits that such a scheme gives to an individual's health.

			HOSPITAL + GP VISITS DECR.			
	WEIGHT DECR.	BP DECR.	BEFORE (12 mon)	DURING & AFTER (12 mon)	MOOD IMPROVED	EXERCISE OUTSIDE CLASS INCR.
1	N	?	7	8	Y	N
2	N	?	1	0	Y	Y
3	N	?	5	2	Y	Y
4	N	Y	7	11	Y	Y
5	N	Y	10	8	?	?
6	N	Y	4	3	Y	Y
7	N	Y	6	4	Y	Y
8	Y	?	10	5	?	?
9	N	?	4	3	?	?
10	N	Y	12	10	Y	Y
11	Y	N	23	9	Y	N
12	N	?	2	1	Y	N
13	N	?	9	7	?	?
14	N	?	3	0	?	?
15	Y	Y	5	3	N	Y
16	N	?	3	4	?	?
17	N	?	7	3	?	?
18	Y	Y	0	0	Y	Y
19	N	?	14	1	?	?
20	Y	?	7	4	Y	N
21	Y	Y	7	0	Y	Y
22	N	?	14	15	?	?
23	Y	?	7	3	N	Y
24	N	?	3	1	?	?
25	Y	?	2	0	?	?
26	N	?	3	1	?	?
27	Y	?	26	11	Y	Y
28	Y	Y	11	4	Y	Y
29	N	?	2	3	Y	N
30	Y	?	1	0	Y	Y
31	Y	Y	?	4	?	?
32	Y	?	11	9	?	?
33	Y	?	17	8	Y	Y
34	N	?	4	2	?	?
35	N	?	4	2	N	Y
36	N	?	15	6	Y	Y
37	N	?	4	13	Y	Y
38	N	?	19	10	Y	Y
39	N	?	5	7	Y	Y
40	Y	?	2	3	?	?
41	Y	?	18	13	Y	Y
42	Y	?	13	8	N	Y
43	N	?	10	9	Y	Y
44	N	?	4	2	Y	Y
45	Y	Y	3	3	Y	Y
46	Y	?	5	0	Y	Y
47	Y	Y	3	1	Y	N
48	Y	?	5	0	Y	Y
49	Y	?	8	1	Y	Y
50	N	Y	8	4	Y	Y
51	Y	?	10	0	?	?
52	N	Y	10	1	Y	Y
53	Y	Y	4	2	Y	Y
54	Y	?	13	10	Y	Y
55	Y	?	3	0	Y	Y
56	Y	?	1	0	Y	N
57	N	N	3	4	Y	Y
58	Y	?	4	2	N	Y
59	Y	?	5	2	Y	Y

RAW DATA

KEY: N – Does not meet Criterion, Y – Meets Criterion, ? - Information Not Available / Unclear in Notes,

CRITERIA 1 a): CESSATION OF ANTI-DEPRESSANT DRUGS WHILST/SOON AFTER PARTAKING IN THE EXERCISE ON PRESCRIPTION SCHEME

JUSTIFICATION

Depression is an important cause of morbidity and mortality and produces the greatest damage to overall health compared with other chronic diseases such as angina or arthritis.⁷ Antidepressants used for treatments have been associated with adverse side effects whilst also having poor adherence and there is also a definite lag time between the initiation of antidepressants and any noticeable improvements in mood. Other treatments used such as psychological methods are usually free from side effects, but have a negative perceived stigma and so are sometimes not popular with patients. It is because of these flaws in current treatment that there has been an increasing interest in the possible role of alternative therapies such as music therapy, family therapy, marital therapy, light therapy, acupuncture, relaxation and exercise for the management of depression. The UK National Institute of Clinical Excellence (NICE) guideline for depression recommended structured, supervised exercise programmes, three times a week (45 minutes to 1 hour) for a 10 to 12 week period for mild depression.⁸ The programme offered by Pennygate has nearly that exact structure. If indeed exercise reduced the need for anti-depressants then there would be benefits for the patient i.e. no side effects, no need to take medication and also for the NHS i.e. reduced costs.

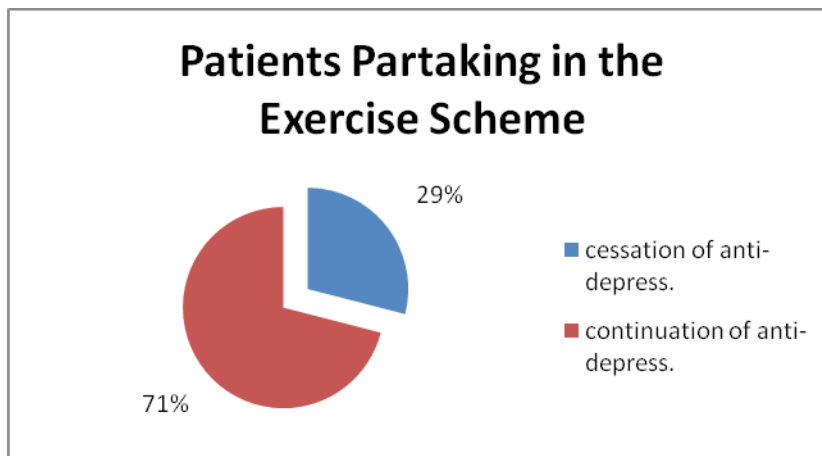
RESULTS & EXPLANATION

The cohort was self-defined as seventy as the number of patients that have taken part on the scheme and have been on prescription anti-depressants was such. Out of seventy patients thirty-two did not complete the course for various personal and medical reasons. Although the results for the remaining thirty-eight were significant as eleven (29%), nearly a third, of those who were taking the medication and completed the exercise scheme soon ceased taking their medication.

⁷ Mead GE, Morley W, Campbell P et al. Exercise for depression; Cochrane Database of Systematic Reviews 2008, (4):CD004366.

⁸ Blumenthal JA, BabyakMA, Doraiswamy PM, Watkins et al. Exercise and Pharmacotherapy in the treatment of major depressive disorder. Psychosomatic Medicine 2007;69: 587–596

Comparatively out of the thirty-two that did not complete the twelve week exercise scheme only seven stopped their medication, leaving 78% still on anti-depressants. Ideally this criterion would look at a larger cohort to make a stronger point although cessation of the scheme by numerous patients prevented this. Research has shown physical activity is more beneficial for mildly depressed patients and by definition these are patients who experience less anhedonia and have more motivation than moderately or severely depressed patients and so are more likely to continue on the scheme. Also those who have already been started on anti-depressants may be unwilling to stop them until they have finished the prescribed course despite noticing benefits due to the exercise classes. Another factor to consider would be that the effects of anti-depressants are not fully seen until 8 to 12 weeks after initiating the treatment which means that the positive impact of the physical activity could be falsely contributed to anti-depressants started recently.



The remaining components of my audit were carried out on a randomly selected cohort of 100 patients who were listed on the general practice's database as having participated in the exercise classes with at least 80% attendance. The data used for the audit was obtained by viewing the patient's medical folders, utilising the general practice's database searches and also contacting the patients in question for their subjective opinions and views. The cohort considered a vast cross-section of society including male and female patients ageing from eighteen to seventy-eight.

CRITERIA 1 b): PARTICIPANTS OF THE SCHEME EXPERIENCING A SUBJECTIVE IMPROVEMENT IN MOOD

JUSTIFICATION

Studies have shown in the past that regular exercise can reduce the incidence of depression and even aid recovery from such. For example, one study showed that for women, moderate levels of ambulatory activity i.e at least 7500 steps/day were associated with around 50% lower prevalence of depression compared with being sedentary (less than 5000 steps/day). Also in the same study it was shown that relatively short durations of leisure physical activity, around 1.25 hours/week were associated with approximately 45% lower prevalence compared

with those doing no hours per week.⁹ Improved self-esteem is a key psychological benefit of regular physical activity. Exercise may act as a diversion from negative thoughts, and the ability to learn a new skill may act as a positive reinforcement for the sufferer.⁷ Social contact and interaction may also act as another source of diversion and positive reassurance. When exercising rises in endorphin and monoamine levels occur and a reduction of the hormone – cortisol (associated with stress) occurs. A euphoric feeling may also be triggered with an associated positive, energising outlook on life. Endorphins also act as analgesics i.e. diminishing the patients' perception of pain. These physiological changes all result in a noticeable improvement of mood. Studies have suggested that exercise stimulates the growth of new nerve cells and causes the release of proteins, i.e. brain derived growth neurotrophic factor, which are known to improve health and survival of nerve cells.^{10, 11}

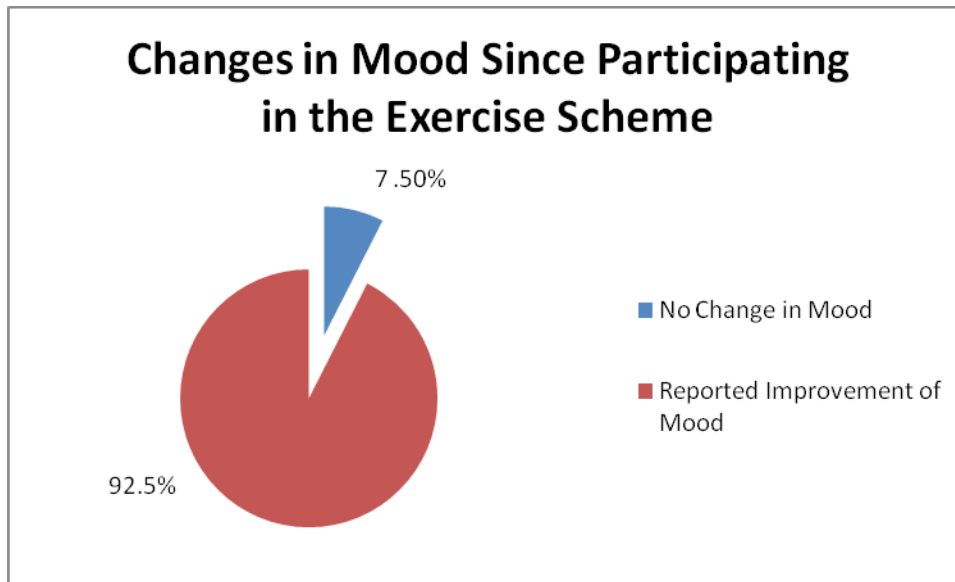
RESULTS & EXPLANATION

Of the 80 patients questioned within the 100 patient cohort a clear subjective improvement of mood and positive outlook on life was observed. Over 92% reported a noticeable improvement in their mood since participating in the scheme. The improvement of mood over majority of the cohort supports the evidence mentioned earlier. Those that did not experience a change in mood could have been due to numerous factors including a well established depressive episode during the scheme or negative life events occurring. Also it is important to consider why the patients' mood improved as this could explain further why some members of the cohort did not experience this improvement of mood. Further studies could see whether there was a correlation between weight lost and improvement of mood or reduced number of hospital and general practice admissions and consultations and improvement of mood. Many participants spoke highly of the social aspect of the classes as they met similar people to themselves with whom they could talk about shared issues (e.g. health problems, family problems etc.) which helped improve their mood.

⁹ McKercher CM, Schmidt MD, Sanderson KA et al. Physical activity and depression in young adults; American Journal of Preventive Medicine. February 2009, 36 (2):161-4

¹⁰ American Psychiatric Association, Practice Guideline for the Treatment of Patients with Major Depression, 2000

¹¹ Duclos M, Gouarne C, Bonnemaïson D. Acute and chronic effects of exercise on tissue sensitivity to glucocorticoids. Journal of Applied Physiology 2003;94: 869–875



CRITERIA 2: PARTICIPANTS OF THE SCHEME EXPERIENCING A WEIGHT LOSS

JUSTIFICATION

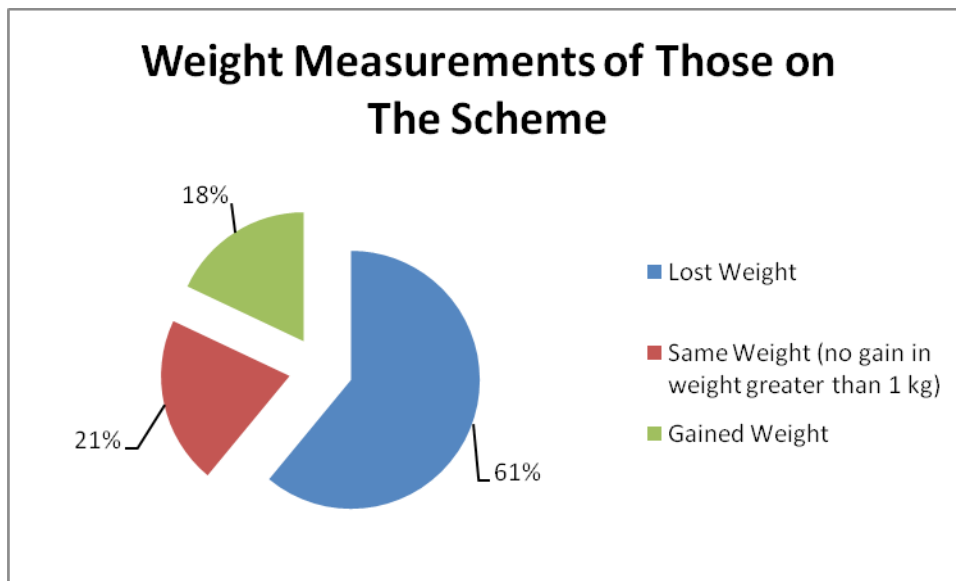
Obese people have higher rates of morbidity and mortality and so it is in the best interest of the patient to lose weight to improve longevity and decrease morbidity. Obesity has a significant impact on the musculoskeletal system associated with both degenerative and inflammatory changes such as osteoarthritis, rheumatoid arthritis, spondyloarthropathy, and fibromyalgia.²

Also by reducing patients' weights the need for procedures and treatments, required for the conditions for which obesity is a risk factor for, are also reduced. For example, more joint replacements are needed by those who suffer with obesity but they are also less successful and often need repeating costing thousands upon thousands for the NHS.²

RESULTS & EXPLANATION

Out of the 100 members of the study 61% experienced a reduction in weight with an average of 3kg lost. The greatest lost experienced by a participant was 9.9kg over the twelve week period. Sometimes the attendance to the twelve sessions was over a longer period of time than twelve weeks which in some cases could have led to no change in weight. Further research could be done to see whether there was an association between attendance to the twelve weeks within three months with a greater weight loss. Weight loss is due to expending more energy (i.e. exercising more) and reducing energy intake (eating less) and so if they increased the amount they were consuming or in fact not altered the amount they consumed then a static weight may have been observed. The use of more calories is obviously one of the mainstays of the weight loss particularly from the scheme's perspective and so within these sessions it is necessary to get the patients exerting themselves which is why having an instructor to a relatively small group is such a benefit. The instructor would encourage the patients, push them further and also show them how to maximise the exercise they do within the limitations set by their health issues. Some

of the patient's efforts and exertion would be echoed in the amount of weight they lost. Research has shown that even if weight is not lost then there are still benefits to increasing physical activity. An increase in physical activity and cardiorespiratory fitness diminishes the health hazard of obesity.¹² Measuring a patient's weight does not allow for the consideration of the varying amounts of fat and muscle tissue or fluid retention which all contribute differently to the weight measurement. Therefore, a weight measurement may be greater in those who are more muscular or who are retaining significant amounts of fluid but this does not reflect their degree of obesity or health risk.¹³ A suggestion would be to measure the abdominal circumferences of the participants weekly to measure central obesity. A waist circumference greater than 88cm (35 inches) in women or greater than 102cm (40 inches) in men, acts as an indirect gauge of notable visceral weight distribution. This distribution is associated with an increased risk for the metabolic complications of obesity, for example, diabetes mellitus, hyperlipidaemia etc.¹³ This could mean that those of the cohort who did not lose weight may have in fact lost fat and gained muscle. They also may have noticed a reduction in their abdominal circumference and so reduced their health risks.



CRITERIA 3: PARTICIPANTS OF THE SCHEME EXPERIENCING A LOWERING OF BLOOD PRESSURE

¹² Lee DC, Sui X, Blair SN. Does Physical Activity ameliorate the Health Hazards of obesity? Br J Sports Med, January 2009; 43 (1): 49-51

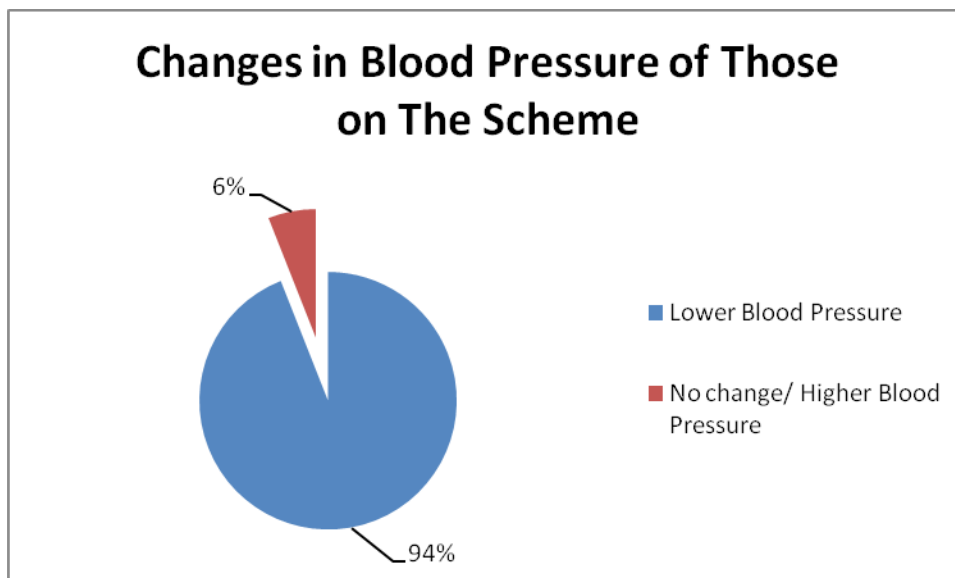
¹³ Hamilton M. Strategies for the management of patients with obesity. [Review] Treatments in Endocrinology. 2002 1(1):21-36

JUSTIFICATION

There are numerous epidemiological, prospective cohort and intervention studies describing CVD as a disease mainly associated with physical inactivity.¹⁴ The exercise-induced improvements are multifactorial and occur in the cardiovascular function at the vascular wall. Physical activity modifies several CVD risk factors including reducing coronary artery disease, aging, diabetes mellitus, hypertension, heart failure and peripheral arterial disease. To look at the improvement of these risk factors this audit will look at a readily available measurement which is the blood pressure of the patients to look at the level of hypertension.¹⁴

RESULTS & EXPLANATION

The blood pressure was recorded just before (within a week of when) the patient started the scheme and as they finished their twelve week block in only thirty-three patients. This is most likely to be due to health indicators only highlighting the necessity of blood pressure measurements in this group. 94% of these experienced a drop in blood pressure whilst the remaining 6% experienced a slight rise in blood pressure or no change. This demonstrates well the benefits of regular exercise and healthy living for a healthier blood pressure. This strong correlation shows a definitive link with lower blood pressure and increased physical activity. One third of the patients had a recorded blood pressure. The benefits for CVD risk and lowering of blood pressure could be further emphasised by recording the blood pressures of all of those that participate in the scheme. At Pennygate only the blood pressures of those with a recognised CVD risk were recorded therefore limiting access to the participants' blood pressure.



¹⁴ Leung FP, Yung LM, Laher I et al. Exercise, vascular wall and cardiovascular diseases: an update (Part 1). Sports Medicine 2008. 38(12):1009-24

CRITERIA 4: PARTICIPANTS OF THE SCHEME HAVING REDUCED HOSPITAL INPATIENT AND OUTPATIENT ADMISSIONS AND GENERAL PRACTICE CONSULTATIONS

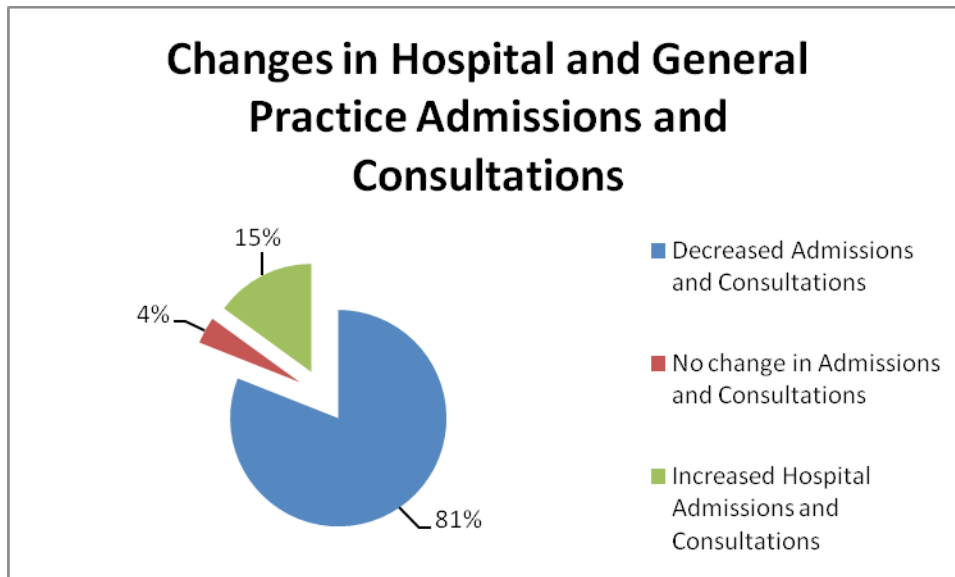
JUSTIFICATION

This criterion will look at the hospital and general practice consultations and admissions for a period of twelve months before and after participating in the exercise scheme. This looks generally at the health of the patient before and after the classes. Research into the relationship between physical activity and health has shown that the more time adults spend carrying out moderate to vigorous intensity activity then the less likely they are to suffer from poor health. High volumes of 'non-exercise' waking hours has been associated with biomarkers of metabolic health with an increased risk of diabetes type 2, cardiovascular disease etc. ⁶

RESULTS & EXPLANATION

The decrease (by 81%) in admissions and consultations could be due to numerous factors including a general improvement in health ranging from the strengthening of the musculoskeletal system, more balanced nutrition to improved cardiovascular function. If the patient in question was suffering from a chronic condition, for example a newly diagnosed carcinoma then there will be a higher frequency of admissions and consultations and have no relation to the patient's

health as affected by the exercise scheme therefore perhaps skewing the data.



CRITERIA 5: PARTICIPANTS OF THE SCHEME EITHER INCREASING THE AMOUNT OF EXERCISE THEY CARRY OUT OR STARTING TO EXERCISE ON A WEEKLY BASIS

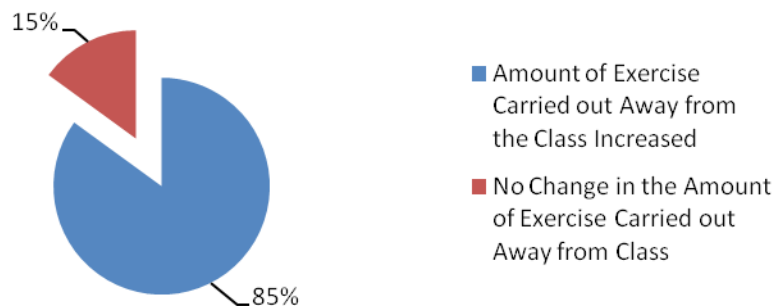
JUSTIFICATION

The 'Obesity Management Scheme' with exercise classes was part of a healthy living campaign and so set out to improve peoples' diets as well as encouraging them to do exercise. The classes were designed to give patients the confidence and ability to exercise on their own. Many of the benefits of exercise are increased the longer the duration of the physical activity and so if the participants started to exercise on their own then the scheme was successful on these terms.

RESULTS & EXPLANATION

Majority (85%) of the 80 patients questioned described being more active since starting the programme participating in classes ran elsewhere (e.g. the local leisure facilities) and also independently, for example, more walks, exercising in their own home etc. The benefit of the classes running at the general practice were described to be that they were not intimidating as there were other like-minded patients and patients of the same ability. The patients described feeling safe and supported during the classes which led to them pushing their own physical boundaries enabling them to exercise more than they feel they could have on their own.

Change in the Amount of Exercise Carried out Independently Away from the Class



CONCLUSION

The efficacy of the obesity management scheme is justified above in numerous aspects. The 12-week long course improved numerous attendees mood and resulted in some of those diagnosed as clinically depressed and being treated with anti-depressants ceasing their treatments. The results listed clearly demonstrate an improvement of the participants' health in all areas. For example 92.5% of the cohort questioned reported an improvement of mood which was reinforced by the number of patients ceasing their anti-depressant medication being greater if they participated in the scheme. Patients (61%) also lost weight whilst participating which has reduced their risk of developing many chronic illnesses, for example diabetes Type 2. 81% of the cohort required fewer hospital and general practice admissions and consultations showing a general improvement of health. Majority of the patients also benefited from a reduction in blood pressure which would lower their risk of CVD. This audit also shows the potential for a continuation of said improvement of health in the participants' lives as 85% took up a more active lifestyle by participating in more physical activities and enjoying a generally healthier lifestyle since starting on the scheme.