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THE DORSET GET-FIT CAMPAIGN — COMMUNITY FITNESS TESTING PROGRAMME

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SUMMARY AND CONCLUSIONS

A pilot programme promoting fitness and exercise was launched through the local media in the Bournemouth area. The aim was to study the feasibility and effectiveness of a fitness testing programme as a trigger to increase exercise participation. Three hundred and eighty adult volunteers (male and female, all ages) undertook a sub-maximal fitness test and were given advice on exercise and diet by trained counsellors. Two hundred and eighty-five (75%) completed a second, follow-up fitness test, four months later.

The results were very encouraging. Almost all of those classified as being unfit at the first test had exercised more frequently and made great improvements in physical fitness by the second test ($p < 0.01$). Similarly, most of those who were overweight made substantial weight reductions during the course of the campaign ($p < 0.01$). The majority of the group also made important changes in their diet.

There appears to be sufficient interest in the general population to recruit people of all ages and fitness levels to join in fitness promotion programmes, but drop-out rates may be appreciative. On the basis of these findings it is proposed that fitness testing is an acceptable and helpful trigger to increased physical activity for both males and females of all ages. Such an increase in exercise appears to result in important improvements in fitness and, in combination with dietary modification, favourable reductions in weight. Further work should now be conducted in the form of controlled trials to compare the costs and effectiveness of fitness testing programmes with other methods of raising exercise levels in the community.

INTRODUCTION

The relationship between exercise and good health has been consistently and convincingly argued in the past decade (e.g. Fentem and Bassey, 1977). In the UK the Sports Council reported in 1982 a considerable upsurge of interest in the past five years during which time many thousands of men and women have begun to take regular exercise. In spite of these developments, however, regular moderately vigorous exercise is still not undertaken by the majority of the population (Nutbeam and Catford, 1983). There remains a major task for health and other professionals to present the case for regular exercise, and to offer imaginative programmes which will encourage participation.

The Dorset Get-Fit Campaign was a unique experimental project designed to examine the feasibility and costs of mounting a community fitness testing scheme. Specific objectives were to determine whether a fitness test, combined with positive health counselling, was associated with changes in exercise levels, physical fitness, smoking and dietary behaviour.

The project was undertaken jointly by the Health Education Council, the Sports Council, Abbey Life Insurance Company, Fitness for Industry Limited and Wessex Regional Health Authority. It was based in Bournemouth using a gymnasium in the centre of town as the testing centre.

METHOD

Residents in the Bournemouth area were invited through the local media to participate in a free fitness-testing programme. Public awareness was generated through short advertisements, interviews on the local radio and a newspaper article supported with an application form. Throughout the recruitment phase, special efforts were made to stress that women and men over 16 years of age were welcome to apply who were basically well but lacking in fitness. All applicants were asked to state present frequency of exercise. Of 716 applications received 480 were offered a test on dates over five weekends in May 1983. Applicants were not included if there were too many in one particular age/sex category or if they had stated they already exercised regularly.

Fitness tests were performed by trained staff of Fitness for Industry Ltd. The first assessment included height, weight and blood pressure measurements, and the Astrand and Rodahl (1977) sub-maximal fitness test designed to measure cardiovascular efficiency (VO_2 capacity) using a cycle ergometer. Participants were given an age and sex adjusted fitness score ranging from Excellent and Good through to Satisfactory, Unsatisfactory and Poor (criteria available from Fitness for Industry Ltd., 116 Pall Mall, London). As this pilot project was primarily designed to test the feasibility of organising a community fitness-testing scheme no control group was used.

Following the test, participants then completed a detailed questionnaire on present levels of exercise and smoking, as well as aspects of diet, rest and relaxation. Using this information counsellors gave

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individual advice and encouragement about healthy lifestyles and the availability of local keep-fit and sports clubs. The counselling team consisted of Health Education Council trained "Look After Yourself" tutors and representatives of the Bournemouth Sports Council.

At the interview all participants were also invited to attend for a follow-up test four months later. Between these two tests they were sent a newsletter which was designed to reinforce earlier messages about exercise, diet and smoking. The newsletter also featured specific individuals and how they were getting fit. A second assessment was held in September at the same gymnasium over three weekends. An extended questionnaire was also administered which inquired into any changes in lifestyle over the four month period. Further details of the study design and methods are available (Nutbeam, 1984).

RESULTS

Four hundred and forty people attended for the first assessment of which 60 were excluded for medical reasons (e.g. high blood pressure, excessive breathlessness or illness during the study period). A further 95 failed to turn up for the second assessment; no reason was given. Two hundred and eighty-five therefore completed the first and second fitness tests and interviews. Non attenders were evenly distributed between the age and sex groups, but not by level of fitness. A high proportion of those who dropped out were classified as Unsatisfactory and Poor at first test (28% of all participants in those two groups).

The following results are presented for the 285 who completed both fitness tests unless otherwise stated.

Changes in Fitness and Exercise Frequency

One hundred and eighty-five (65%) of participants recorded an increased VO_2 score with a mean average improvement in VO_2 of 26%. Twenty-nine (10%) remained the same, and 71 (25%) had a decreased VO_2 score, of which the mean was -12% .

One hundred (35%) participants reported an increase in frequency of vigorous exercise (examples given were jogging, swimming, traditional team sports), a further 66 (23%) reported an increase in frequency of moderate exercise (examples given were walking, gardening, golf), 86 (30%) reported the same frequency of exercise and 33 (12%) a decreased frequency. Table I shows the close relationship between increases in reported frequency of exercise and improvements in fitness (VO_2 score). The differences in changed VO_2 score between participants reporting increased vigorous exercise and those reporting the same or less exercise statistically is highly significant ($p < 0.001$).

TABLE I

Mean percentage change in VO_2 score between tests by change in exercise and sex.

Sex	Change in Exercise			
	Increased Vigorous Exercise	Increased Moderate Exercise	Same	Less Exercise
Male	+27.5% (53)	+13.5% (34)	+ 0.5% (44)	-15% (17)
Female	+26% (46)	+15% (31)	+10% (40)	- 3.5% (20)
Total	+27% (99)	+14% (65)	+ 5% (84)	- 8.5% (37)

(Number of subjects in brackets)

Tables II and III demonstrate that those categorised as below a target level of fitness (i.e. Unsatisfactory or Poor) made the largest improvements in VO_2 score, and in exercise frequency. The differences between participants originally categorised as "unsatisfactory" and "poor" and those categorised as "excellent" and "good" are statistically significant ($p < 0.01$).

TABLE II

Mean percentage change in VO_2 score between tests by fitness rating and sex.

Sex	Fitness Rating				
	Excellent	Good	Satis.	Unsatis.	Poor
Male	-2% (24)	-1.2% (41)	+21% (58)	+11% (14)	+38% (11)
Female	-9.5% (5)	+3% (34)	+15% (57)	+26% (29)	+30% (12)
Total	-3% (29)	+0.7% (75)	+18% (115)	+21% (43)	+34% (23)

(Number of subjects in brackets)

Of the 67 participants classified as Poor and Unsatisfactory in fitness - 49 improved their level of fitness, 9 remained the same and 8 showed a reduction in their level of fitness. The mean percentage improvement in VO_2 score of those who increased their score was 36%, with a range of between 4% and 100% improvement. Overall this group improved by a mean average of 25.5% with a range of -7.5% to $+100\%$ VO_2 score change.

TABLE III

Percentage of all participants reporting change in exercise between tests by fitness rating.

	Fitness Rating				
	Excellent	Good	Satis.	Unsatis.	Poor
Change in Exercise					
Increased vigorous exercise	28% (8)	17% (13)	39% (44)	40% (17)	74% (17)
Increased moderate exercise	3% (1)	16% (12)	33% (38)	27% (12)	9% (2)
Same	55% (16)	44% (33)	16% (19)	27% (12)	17% (4)
Less exercise	14% (4)	23% (17)	12% (14)	6% (2)	0
All	100% (29)	100% (75)	100% (115)	100% (43)	100% (23)

(Number of subjects in brackets)

Changes in Recorded Weight

From the height and weight measurements taken of each participant, body mass index scores (BMI) were calculated using the formula $\text{kg} \div \text{m}^2$ (kilograms $\div$ square metres surface area). Those with a BMI of over 25 are generally classified as "overweight" and those with scores in excess of 30 as "obese" (RCP, 1983). Eighty-eight (31%) participants were found to be overweight and a further 17 (6%) obese. Eleven (4%) had a BMI below 20 and would normally be classified as "underweight".

One hundred and eighty-five participants (65%) lost weight over the four month period, with a further 29 (10%) remaining the same and 71 (25%) gaining weight. Table IV shows how those classified as overweight or obese made greater weight reductions than those with BMI below 25 ($p < 0.01$). Weight reduction also appears to be related to changes in exercise as shown in Table V. Those reporting increased frequency of exercise achieved greater mean average reductions in weight than those exercising the same or less ($p < 0.001$).

TABLE IV

Mean percentage changes in weight between tests by body mass index score and sex.

Sex	Body Mass Index			
	< 20	20-25	26-30	> 30
Males	-0.4% (4)	-2.4% (78)	-3.3% (56)	-3.7% (10)
Females	+0.5% (8)	-1.6% (90)	-2.9% (32)	-3.7% (7)
Total	+0.3% (12)	-2% (168)	-3.1% (88)	-3.7% (17)

(Number of subjects in brackets)

TABLE V

Mean percentage change in weight between tests by change in exercise and sex.

Sex	Change in Exercise			
	Increased Vig. Ex.	Increased Mod. Ex.	Same	Less Exercise
Male	-3.9% (53)	-2.5% (34)	-2.4% (44)	-1.2% (17)
Female	-2.5% (46)	-2.4% (31)	-1.5% (40)	-0.5% (20)
Total	-3.3% (99)	-2.5% (65)	-2.06% (84)	-0.8% (37)

(Number of subjects in brackets)

Of the 105 overweight and obese participants (BMI over 25) 81 lost weight, 16 remained the same and only 8 increased their weight over the study period. The mean percentage weight reduction in those who lost weight was 4.5%, with a range of 1% to -11% reduction. Overall the whole group reduced weight by a mean average of 3.5% with a range of $+3.5\%$ to -11% weight change.

Other Lifestyle Changes

At the first and second interviews simple questions about salt, sugar and wholemeal bread intake were asked. At the second interview respondents were also asked about more general changes in their diet. There were clear dietary improvements observed.

Two hundred and six participants (72%) reported some conscious change of diet over the four month period, with 117 (41%) reporting to eat more high fibre food, 134 (47%) less sugary foods, 128 (45%) less fatty foods and 72 (25%) less meat. There was also a considerable reduction in those adding salt at the meal table (from 54% to 32%), a reduction in those adding sugar to tea and coffee (from 35% to 28%)

and an increase in those eating more wholemeal bread than any other bread (from 70% to 78%).

Only 41 (15%) were smokers. Although 31 maintained their existing level of smoking, 10 reported a reduction or cessation. These changes did not appear to be related to age, sex or initial fitness score. Three smokers gave up during the period of the campaign.

DISCUSSION

Health related fitness testing has been carried out on a population level in Canada (Canada Fitness Survey, 1982) but not in Britain. The Dorset Get-Fit Campaign is one of the first of its kind in trying to improve knowledge about exercise levels in the general population.

The major objective of the project was to determine whether it was feasible to mount a community-based fitness-testing programme and whether there was sufficient public interest. In the event, with little promotion, sufficient numbers of participants came forward such that 236 people (33% of total requests) could not be accommodated.

The results regarding personal changes in behaviour and fitness were very encouraging. The majority of the participants improved their levels of exercise and fitness and this was most marked in priority groups. The small changes noted in those categorised as already fit at the first test were to be expected as these participants had already achieved a satisfactory level of fitness and the scope for improvement was obviously less. Improvements in fitness can be seen in all age groups and in both sexes, suggesting that fitness testing may be an acceptable starting point for action to improve fitness by a large proportion of the community.

Another important result of the programme was that the majority of the participants also lost weight, and a high proportion reported dietary changes towards the health goals recommended. Reductions in weight were most marked along priority groups — i.e. those classified as obese and overweight — and can be seen in all age groups and in both males and females. The key relationship between energy intake and energy expenditure was carefully explained to participants at interview and the results indicate that a high proportion took appropriate action to adjust the balance between the two. The effect of increased physical activity on smoking behaviour was much less obvious. The number of smokers in the study population was too small to observe any statistically significant changes in behaviour.

Although encouraging, the results should be interpreted carefully in view of the design, planning and execution aspects of the project. Of particular note is the representativeness of the study population and the overall cost of the programme. In addition, because there was no control group it is not possible to know whether those who undertook increased physical activity, and consequently improved fitness, may have done so anyway despite of the fitness test and counselling. Nevertheless the results are consistent with the hypothesis that fitness testing is an effective trigger to changes in health related behaviour. Having established the feasibility of this approach, a controlled trial is now required.

The use of the mass media for recruitment to fitness programmes has difficulties. Volunteers do not normally form a group representative of the general population and this appears to be true in the case as evidenced by the low prevalence of smokers. It is likely, therefore, that those who were already fit and active, or those already motivated to improve their fitness were disproportionately attracted to the programme. There

were roughly even numbers of males and females across the age groups, but there were fewer applications from the younger (16-30) and older (60+) age groups. In view of the active recruitment of unfit participants it was surprising that 36% of the population group completing both tests were classified as already satisfactorily fit at first assessment.

More positive efforts will be needed to recruit unfit and inactive participants to this type of programme in the future. Specific attention may also be required to attract the younger age groups. This might be achieved through a combination of approaches including targeted publicity, a system of referrals and a well defined initial screening process. In addition, if such a programme is to be recommended on a wider basis, costs need to be reasonable at approximately £30 per participant (excluding organisational costs) it is unlikely that NHS health education units or sports centres could afford to organise such a programme on a population basis.

The main costs of recruitment, fitness testing and counselling in this project could have been reduced dramatically. For example, rather than using paid advertising, participants could have been referred by general practitioners or other health staff. In addition, participants were tested and counselled on a one-to-one basis. This is probably excessive as those administering the fitness test can supervise more than one person at a time and group counselling could have been offered. By incorporating these and other adaptations we estimate that the marginal costs might be less than £7 per person. This is a much more reasonable expense which, if preferred, could be borne by participants. Further details of the costings are available (Nutbeam, 1984).

For the future more research is needed to determine the most cost effective methods of raising exercise participation in the community. In Dorset we are currently developing a more streamlined, less expensive form of fitness-testing.* When the results of the evaluation are available they should provide further insights into fitness promotion techniques.

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