Look After Your Heart programme: impact on health status, exercise knowledge, attitudes, and behaviour of retired women in England

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Abstract

Objectives – To evaluate the impact of the Health Education Authority's 20 hour Look After Your Heart health promotion course on a large group of retired women.

Design – Three groups of retired women were compared: group 1 women, drawn from 12 retirement groups, participated in the programme; group 2, drawn randomly from the same groups, declined; group 3, selected randomly from 12 different retirement groups matched for geographical area, were not offered the course.

Setting – Twenty four retirement groups established by a major national retail company in England.

Subjects – A total of 739 women with a mean age of 66 years participated. Altogether 200 women were in group 1, 192 in group 2, and 347 in group 3.

Main outcome measure – The Nottingham Health Profile was administered and exercise knowledge, attitudes, and behaviour of the three groups were assessed using a validated, reliable questionnaire.

Results – Group 1 had significantly better self-perceived health, indicated by lower Nottingham Health Profile scores, more exercise knowledge, and positive exercise attitudes and they did more exercise than the other two groups. The responses of groups 2 and 3 were similar. Time since completion of the programme did not have any effect on Nottingham Health Profile scores, exercise knowledge, and behaviour.

Conclusion – The Look After Your Heart programme is associated with beneficial and persistent effects in retired women. Detailed studies are needed to confirm whether these associations are due to the programme or reflect the selection of fitter, healthier subjects.

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Exercise provides a needed stimulus for the maintenance of structural and functional integrity of the cardiorespiratory system,¹⁻² the locomotor system,³⁻⁵ and probably the autonomic nervous system and motor neurons.⁶

The risks of developing chronic illness and disability in old age may be prevented and

alleviated by adopting a more physically active lifestyle.⁷⁻⁹ With greater functional fitness more activities of daily living can be performed efficiently within the working capacity of the individual,¹⁰ and some of the decline in physical capacity which seems to occur with, rather than because of ageing,¹¹ may be alleviated.

Evaluation of the psychological changes and quality of life associated with exercise participation is also of interest. Potential mechanisms that mediate improvements in wellbeing are thought to involve enhanced feelings of mastery and physiological changes from increases in brain and plasma opioid concentrations.¹²

It is possible that people will only benefit from exercise if it is performed vigorously for 20 minutes at least three times per week.¹³ For older people a more modest intensity and frequency of exercise may be beneficial. Customary activities such as regular brisk walking may be of use in the prevention of stroke¹⁴ and osteoporosis^{15 16} and are closely correlated with unspecific symptoms.⁹

The recent health policy initiative, the Health of the Nation, will rely on improving the health behaviour of large sections of the population, particularly the "young elderly" who have a high risk of cardiovascular disease, to achieve reduced mortality targets.¹⁷ Increased physical activity and exercise are key strategies that are expected to play a part in reducing the risk of cardiovascular disease. Exercise remains a minority pursuit for people in general and older women in particular,^{4 18} and levels of customary physical activity are also low.¹⁹

The Health Education Authority has developed the national health promotion course – Look After Your Heart²⁰ in response to the low exercise participation rates and the link between exercise and coronary heart disease. The programme is taught for two hours a week by a trained Health Education Authority teacher and lasts for 10 weeks. The course combines both exercise theory and practice. The programme consists of three parts: risk factors associated with heart disease, how to exercise regularly in a safe way, and how to cope with stress.

Look After Your Heart courses have received little evaluation of effectiveness. To date, only one small scale study has been conducted to assess the programme's effects on elderly people.²¹ The present study aimed to evaluate the programme's effects on self-perceived health status, exercise knowledge, attitudes, and behaviour on a large group of retired women.

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Subjects and methods

The subjects were 739 women in England who were retired employees of a major British retail company and belonged to their local retirement association. The women formed three groups: group 1 comprised 200 women from 12 retirement associations who had taken part in a Look After Your Heart course. Group 2 comprised 192 women randomly selected from the same 12 retirement associations who had been invited to attend a course but had declined the invitation. Group 3 comprised 347 women who were randomly selected from 12 different retirement associations whose members had not been invited to attend a course and whose retirement areas, which were the same as their working areas for most women, matched the area social deprivation scores of the other 12 groups.²²

The Nottingham Health Profile (NHP) was used to measure self-perceived health status. Part 1 asks about current health in six dimensions – energy, pain, emotional reactions, sleep, social isolation, and physical mobility. Part 2 is concerned with whether health is causing problems with everyday activities such as looking after the home, sex life, hobbies, and holidays. Respondents are asked to give a “yes/no” answer to each item. The NHP was sent by post with up to two repeat mailings. It was scored conventionally using the published item weights giving a score ranging from 0 to 100 on each dimension of part 1. Part 2 scores were obtained by simply presenting the proportions of respondents checking “yes” to each item. The distributions of NHP scores were presented using mean (SD) for convenience and comparability with reference standards but appropriate non-parametric statistical tests were carried out. The NHP is a valid and reliable tool for measuring health status, particularly in older people.²³

Reference population values (means only were reported) for 2173 women aged 65–69 years were obtained from published data on a random sample of people registered with general practitioners in the Nottingham area.²³

LONDON HEALTH AND FITNESS QUESTIONNAIRE

All women were sent the London Health and Fitness Questionnaire (LHFQ) through the post. The questionnaire was developed for this and other studies of physical activity in older people. It was derived from initial in depth interviews to define key areas of importance which were held with selected groups of elderly people attending a local Age Concern advice office and a lunch club. A questionnaire suitable for postal administration was derived from these in depth interviews and was organised into a series of questions about exercise behaviour and knowledge and additional attitude questions were taken from the Allied Dunbar National Fitness Survey¹⁸ (J N Morris, personal communication). The LHFQ measured peoples' exercise knowledge using a series of positive and negative statements. Attitudes towards exercise were measured using a five point Likert scale and results were pre-

sented as the proportions agreeing and agreeing strongly with specific statements. Exercise behaviour was measured as the amount of time spent in the previous week on domestic activity (for example, gardening, housework), and sport/recreational activity (for example, walking, cycling, and swimming). This was categorised into time intervals of no time at all, less than one hour, less than two hours, less than three hours, and three or more hours and the approximate time (in hours) was computed as the mid-point of each category interval. Very few subjects indicated that they spent more than three hours in specific activities and in these cases a value of four hours was assumed.

The questionnaire was then tested in a random sample of 130 women of pensionable age drawn from the age-sex register of a group practice in Wapping, east London. Up to two further mailings were sent to non-respondents. A sample of 30 respondents was visited and the questionnaire re-administered by an interviewer two weeks after the postal return. A sample of 83 women aged 67 years (range 60–89) responded. Kappa coefficients of test-retest agreement between postal and interview administration were acceptable but were lowest for knowledge items and highest for exercise behaviours. Kappa values are shown in table 1. The correlations between hours spent in domestic activity and sporting/recreational activity were high, 0.92 and 0.76 respectively. The mean (SD) differences in hours between postal questionnaire and interview assessments for the domestic and sporting/recreational activity were –0.6 (2.2) h and 0.1 (1.4) h respectively, indicating excellent agreement between the two measurement occasions.

Construct validity was examined by comparing the exercise behaviours, knowledge, and attitudes in subjects who went out daily and those who did not, those less than and older than the average age of the sample, and those who said they did and did not take a daily brisk walk. More positive knowledge and attitudes towards exercise and more participation in all forms of regular exercise were apparent in those subjects who went out each day, those who were younger, and those who took a daily brisk walk (see table 2).

APPLICATION TO MAIN STUDY SUBJECTS

Group 1 participants were written to after they had finished the Look After Your Heart course. The median duration between course

Table 1 Concordance between responses from self-completed and interview administered versions of the London Health and Fitness Questionnaire

Topic	Kappa
Perceived health and fitness:	
Self assessed health	0.63
Self assessed fitness	0.56
Could walk a mile	0.83
Activities undertaken:	
Going out of the home	1.00
Walking 20–30 minutes a day	0.54
Organised activity	1.00
Social activity	0.79
Knowledge/attitudes:	
Do you exercise enough to keep fit?	0.22
Is exercise beneficial in old age?	0.45

attendance and questionnaire completion was 10 months, with a range of three to 20 months. Non-respondents were sent a second questionnaire six weeks later. It was not possible to obtain measurements on subjects before starting the programme since the investigators were only involved in assessing the impact of the course after it had been introduced by some retirement associations. Other associations were uncertain about using the package

and wanted evidence of effectiveness. It was hoped that a comparison of those who had and had not completed or been offered the programme might give some guidance for these retirement associations.

STATISTICAL ANALYSIS

The Kruskal-Wallis one way analysis of variance (ANOVA) and χ^2 test were used to compare the responses of the three groups on NHP scores and exercise knowledge and attitude questions. Time spent on exercise was calculated in hours and an ANOVA was used to compare the three groups.

Table 2 Construct validity of London Health and Fitness Survey

	Organised activity		Going out daily		Daily brisk walk		Age (y)	
	Yes	No	Yes	No	Yes	No	<69	70+
Self assessed health and fitness (%)								
Good/average health	78	45	52	33	48	48	52	46
Very/fairly fit	100	76	89	44	91	59	86	72
Able to walk a mile	80	43	60	0	62	18	61	28
Do enough exercise	80	59	69	27	69	46	61	61
Duration of activity (h):								
Domestic activity	8.1	6.5	9.8	3.2	11.5	6.2	8.4	4.7
Sport/recreational	3.3	1.2	2.4	0.8	3.9	1.1	3.5	2.2
Attitudes (% agreeing):								
I'm not the sporty type	33	65	60	64	50	63	64	58
I haven't got the time	22	33	33	25	33	27	38	19
I'm too old	0	40	21	80	21	59	16	65
I have a disability that stops me	11	50	34	85	39	55	34	60
I haven't got the energy	10	59	40	92	40	74	41	67

Table 3 Comparison of mean (SD) Nottingham Health Profile scores (part 1) for groups 1, 2, and 3 and percentage of affirmative responses (ie with problems) for part 2. Reference population values are given as means only²³

	Group 1 (n=190)	Group 2 (n=183)	Group 3 (n=331)	Reference population
Part 1 (mean (SD) score):				
Energy	8.2* (19.6)	15.2 (28.6)	14.5 (28.4)	23.6
Pain	6.8* (19.1)	11.5 (22.5)	10.2 (21.8)	20.9
Emotions	5.6 (11.9)	9.0 (18.8)	7.0 (16.2)	12.5
Sleep	17.5 (24.6)	23.0 (28.4)	22.0 (28.2)	38.5
Isolation	2.9 (9.6)	5.5 (14.9)	4.6 (13.6)	5.9
Mobility	4.5** (10.5)	10.5 (18.1)	8.0 (15.5)	18.0
Part 2 (% affirmative responses):				
Paid work	0.5	1.5	2.8	8.2
Housework	8.6**	19.4	15.8	28.8
Social life	3.5**	11.8	11.0	20.5
Home life	3.0	6.7	7.3	6.8
Sex life	3.6	7.3	7.6	15.1
Interests	8.2*	17.4	13.0	19.2
Holidays	5.0	10.7	10.4	19.2

Kruskal-Wallis ANOVA for part 1 and χ^2 for part 2: *p<0.05; **p<0.001.

Table 4 Percentage of subjects correctly responding to statements about exercise knowledge in the three groups

Statement	Group 1 (n=190)	Group 2 (n=183)	Group 3 (n=331)	χ^2
Exercise can:				
1 Prevent heart disease	90	84	85	4.2
2 Develop body strength	89	85	88	1.4
3 Help you lose weight	77	79	78	0.3
4 Release stress	98	88	87	19.0**
5 Help you relax	97	88	89	12.4**
6 Help you make friends	92	83	83	8.9**
7 Give you energy	83	68	75	11.3**
8 Keep you supple	98	94	94	5.9*
9 Get you outdoors	97	96	96	0.4
10 Make you feel good	97	90	92	7.3*
11 Improve health	98	94	95	5.1
12 Give you aches/pains	79	71	72	3.9
13 Weaken your bones	96	94	93	1.9
14 Increase blood pressure	94	88	91	3.6
15 Shorten life span	99	97	95	5.2
16 Be not much fun	87	73	78	10.7**
17 Make you depressed	99	98	97	3.6

*p<0.05; **p<0.01.

Note: questions 1–11 were answered correctly with agreement, questions 12–17 by disagreement.

Results

Responses in groups 1, 2, and 3 were 93%, 91%, and 88% respectively. This gave an overall postal response rate of 90% (739 women). Thirty five of these questionnaires contained a large amount of missing data and could not be used, which left a total of 704 women actively involved in the study.

The mean (SD) ages of the women in groups 1, 2, and 3 were 65 (6) years, 67 (8) years, and 66 (8) years respectively. Most women had worked for the company as sales assistants – 80%, 70%, and 77% in groups 1, 2, and 3 respectively. In all three groups, over 90% of the sample population had left school at the age of 14 years, and over 80% had left school without any formal educational qualifications at all.

The three groups did not differ in their ratings of overall health and fitness. Most elderly women believed they were in “excellent” or “good” health (77%, 72%, and 69% in groups 1, 2, and 3 respectively and that they were “very” or “fairly” fit (95%, 88%, and 90% in groups 1, 2, and 3 respectively).

NHP SCORES

Table 3 illustrates the mean (SD) score and the significance of the group differences on the NHP. Group 1 had significantly better wellbeing scores than the other two groups for the energy, pain, and physical mobility dimensions of the NHP. The scores for groups 2 and 3 were similar and higher. Group 1 reported fewer problems on part 2 of the NHP, while groups 2 and 3 reported similar and higher scores. The reference population of elderly women and groups 2 and 3 had similar or higher NHP scores, suggesting that the study subjects were broadly representative of a community sample of older women.

EXERCISE KNOWLEDGE

The level of exercise knowledge for the women in all three groups was high (table 4). The knowledge of groups 2 and 3 was consistently less accurate than that of group 1 on all questions except one (question 3).

Table 5 Percentage of subjects agreeing with positive exercise attitude statements

Attitude	Group 1 (n = 190)	Group 2 (n = 183)	Group 3 (n = 331)	χ^2
1 Not the "sporty" type	64	73	73	5.9*
2 Not got the time	27	32	33	2.0
3 Too shy	17	15	24	7.2*
4 No one to do it with	37	41	41	0.6
5 Too old	12	24	29	19.4**
6 No local facilities	19	20	19	0.9
7 Health is not good enough	19	28	29	6.1*
8 Need to relax in spare time	36	50	51	12.0**
9 Might damage health	15	26	30	14.6**
10 Don't enjoy exercise	18	31	31	11.3**
11 Haven't got the equipment	63	70	70	0.2
12 Wouldn't keep it up	41	51	52	5.9*
13 Too fat	18	20	26	5.2
14 Can't afford it	21	27	32	7.1*
15 Not very good at sport	65	70	69	0.8

* $p < 0.05$; ** $p < 0.01$.

EXERCISE ATTITUDES

Table 5 shows the differences in attitude between the three groups. Compared with the women in group 1, the women in groups 2 and 3 were more likely to report negative attitudes. The attitudes which groups 2 and 3 expressed were strikingly similar on all questions.

EXERCISE BEHAVIOUR

There were no significant differences between the groups in the amount of time spent each week on domestic activities such as housework, gardening, and shopping. All groups spent about 13 hours a week on this type of activity (table 6). However, group 1 women spent approximately one hour more ($p < 0.001$) on sport or recreational exercise (walking, cycling, and swimming) each week than the other two groups.

TIME SINCE PROGRAMME COMPLETION

Since it was impossible to standardise the time from the Look After Your Heart course to questionnaire completion, the responses given by group 1 subjects were stratified by the median time since course completion (10 months) and compared. There were no significant differences in NHP scores, knowledge, and behaviour between group 1 subjects who completed the questionnaire after the median time of 10 months and those who had completed it more recently. There were significant differences ($p < 0.01$) for three of the attitude items with more recent completers having more positive attitudes to statements: "I cannot afford to exercise", "I am too old to exercise", and "my health is not good enough".

Table 6 Mean number of hours spent on domestic activity and sport/recreational exercise per week by groups 1, 2, and 3

	No of h	(mean (SD))	F ratio	p
Domestic activity:				
Group 1	13.3	3.6	2.1	0.11
Group 2	13.1	4.5		
Group 3	12.5	3.9		
Sport/recreational activity:				
Group 1	5.0*	2.7	9.5	<0.001*
Group 2	3.9	2.6		
Group 3	4.1	2.7		

Discussion

Members of group 1 who attended the health promotion course showed that they had significantly better NHP scores, more exercise knowledge, more positive attitudes towards exercise, and spent more time on "sporty" exercise per week than members of groups 2 and 3. The control groups – group 2 (who declined the course) and group 3 (who were not invited to attend) – gave very similar NHP, knowledge, attitude, and exercise behaviour responses.

The NHP is a well established method of examining self-perceived health status and the differences shown between group 1 and the other groups may be interpreted as a beneficial impact of the Look After Your Heart programme on health status. Because the scores on the NHP were not normally distributed, the SDs are not interpretable but are given for comparative purposes with other studies.

The LHFQ is a new instrument designed for this and other studies of the levels of exercise knowledge, attitudes, and behaviour. It was necessary to develop a new instrument because existing approaches were unsuitable for postal administration¹⁹ and no other instrument could be found. The attitude section was taken from the National Fitness Survey interview schedule which had been developed with some care.¹⁸ We have carried out some reliability and validity testing in older people and have found good evidence of repeatability when the test is applied by post and by interviewer two weeks later. Construct validity was also consistent with expectations. We are confident that the questionnaire is capable of giving reliable and valid measures of exercise behaviour, attitudes, and knowledge. The questionnaire will undoubtedly benefit from further development and performance testing and copies are available from the investigators.

In this observational study it is possible that a selection bias produced by healthier and fitter subjects volunteering to attend the course has occurred. The comparison with group 2 subjects cannot exclude selection bias as the explanation for the better group 1 findings. However, group 3 consisted of people who had not been offered the course and therefore comprised women typical of the whole retired population. In addition, groups 2 and 3 had similar or lower NHP scores to the reference sample of women suggesting a small "healthy retired worker" effect. Special effort was made to match the groups for Jarman deprivation scores to avoid making a comparison potentially biased by north-south or socioeconomic differences. Since the group 2 and 3 results were similar this suggests that major selection bias is an unlikely explanation of the findings and that it is more likely that the course had a positive effect on group 1 women.

Observational studies can never prove causation but can provide supporting evidence of association. Ideally, a randomised controlled trial of the impact of a health promotion programme should be set up but the practical problems of conducting trials of exercise are considerable. A health promotion programme

can never be double-blind and it is almost impossible to blind the assessors to the intervention. It is difficult to standardise the intervention, to force subjects to take part, and to avoid contamination effects in the control group as a result of media and public health campaigns. Furthermore, given the current levels of evidence supporting exercise it is unlikely that an untreated control group would be ethically permissible. For these reasons large randomised controlled trials of the effects of exercise have never been set up.

It would have been preferable to make measurements both before and after the 10 week programme in group 1 women, and to make two assessments of health status and exercise profiles of subjects in groups 2 and 3 at baseline and 10 weeks. This was not feasible since subjects in group 1 had all completed the course before the investigation was started. Moreover, it would have been impossible to examine the duration of effect without making further measurements over a longer period. This study provides the only evidence to support a possible beneficial impact of the national Look After Your Heart programme. Inevitably, it is impossible to exclude selection bias as the explanation for our findings but this would have to be considerable to explain the differences observed.

The national sample used in this study precluded the objective assessment of physical fitness. However, small scale studies have shown that the intensity and frequency of exercise recommended by the programme is unlikely to have a large effect on physical capacity.²¹ This is not necessarily a disadvantage of the programme as it intends to promote exercise, getting people started, rather than providing a definitive, life long programme. Furthermore, it is likely that the intensity and frequency of exercise required for improving physical capacity may be higher than that required for reducing disease risk and improvements in wellbeing.

One of the drawbacks of health promotion courses is that their effects are thought to be only short lived.²⁴ However, the positive results shown by group 1 suggest that the effects of this programme may be long term, since the average time of course completion was 10 months. The results of this and other work²¹ also show the ability of older people to modify their health behaviours.

Previous studies of the impact of exercise on quality of life and self-perceived health have reported conflicting results with benefits claimed for exercise in improving mood and locus of control²⁵⁻²⁷ and no benefit in others.²⁸⁻³⁰ These different findings are probably explained by methodological weaknesses such as the lack of appropriate control groups, poor standardisation of exercise interventions and the limited range of outcomes considered.

Knowledge about exercise was good among all the women in this study, despite the fact that most had left school at the age of 14 years, with very little formal education. The main concerns of all groups were that they perceived themselves as not being very good at sport, as

not being the "sporty" type, and as not having the necessary equipment for it. This study and other work suggests that elderly people's lack of involvement in exercise is the result of inappropriate age stereotypes, the limited exercise experiences of older people while at school,³¹ and beliefs that exercise is harmful to health.³² Health promotion interventions need to explain the myths about physical activity and move away from the image of portraying "sport" as being the major beneficial form of exercise for older people.

Active participation in exercise as experienced by group 1 women through their course seems to promote factual knowledge of exercise and a qualitative, realistic understanding of exercise. This seems to have encouraged group 1 subjects to take exercise, outside of everyday activities, in the form of recreational exercise. Other health promotion studies confirm the importance of participation for behavioural change.^{33 34}

A theory which is supported by our data has been developed recently by Weinstein.³⁵ It is a five stage theory of ordered preventive behaviour called the "precaution adoption process". In stage 1, a person has heard about a health hazard (for example that inactivity can cause coronary heart disease); at stage 2 the person believes that the health problem is important for other people; by stage 3 the personal susceptibility to the health hazard is admitted; at stage 4 preventive action is started; and stage 5 is where the person actually maintains the preventive action. Health promotion courses need to tackle these stages systematically.

Further research is needed if participation in exercise is to be improved. More data of knowledge, attitudes, and behaviour is needed on other groups of women and men who have reached retirement age. Since older people suffer the greatest burden of cardiovascular disease it will be essential that they are included in primary prevention strategies, such as exercise, stopping smoking, blood pressure control, and dietary change, that have an impact over a relatively short time period. It would be unfortunate if older people were ignored on the grounds that they are too old to change or that avoiding disease is not worthwhile in older age. Further work on the benefits and risks of different intensities and frequencies of exercise regimes would lead to better "exercise prescriptions" for older people.

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