AUTHOR(S): STEWART, L., DOLAN, E., CARVER, P. and SWINTON, P.A.

TITLE: Per-protocol investigation of a best practice exercise referral scheme.

YEAR: 2017

Publisher citation: STEWART, L., DOLAN, E., CARVER, P. and SWINTON, P.A. 2017. Per-protocol investigation of a best practice exercise referral scheme. Public health [online], 150, pages 26-33. Available from: https://doi.org/10.1016/j.puhe.2017.04.023

OpenAIR citation: STEWART, L., DOLAN, E., CARVER, P. and SWINTON, P.A. 2017. Per-protocol investigation of a best practice exercise referral scheme. Public health, 150, pages 26-33. Held on OpenAIR [online]. Available from: https://openair.rgu.ac.uk

Title: Per-protocol investigation of a best practice exercise referral scheme

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Abstract

Objectives: To investigate the effects of an exercise referral scheme (ERS) aligned to UK best practice guidelines on a range of outcomes including those associated with key health concerns of the Scottish population.

Study Design: A longitudinal design with data collection at three time points (baseline, midway and post) during a 12 week ERS intervention was employed.

Methods: Health related physical fitness was assessed through measurement of resting heart rate, blood pressure, FEV1:FEV6, body mass and $V0_2$ peak, whilst functional capacity was assessed through the five time sit to stand. Psychosocial wellbeing and quality of life were measured using the WHOQOL-BREF and the Profile of Mood State questionnaires. Growth curve analyses (GCA) were used to model each outcome variable across the three time periods.

Results: A range of effects were obtained with significant linear improvements in physical performance tests ($p<0.001$) and psychosocial assessments ($p\leq0.002$). Additionally, significant quadratic effects of time were obtained for body composition variables and physical activity levels ($p<0.001$) with the greatest improvements obtained between baseline and midway assessments.

Conclusions: An ERS aligned to UK best practice guidelines can positively influence a range of health outcomes including those associated with lung function and cardiovascular fitness which are prevalent medical conditions in Scotland. In addition, results indicate that ERS can positively affect outcomes related to functional capacity as well as mental wellbeing and perceptions of health. The findings of the study identify the need for further investigation including consideration of the initial health status of referred clients.

Introduction

Over the last four decades public health organisations in the United Kingdom (UK) have increasingly focused on the use of physical activity-based interventions to target health behaviours. These interventions are motivated by global recognition that physical activity plays a prominent role in the maintenance of health and in the prevention and management of certain non-communicable diseases such as type 2 diabetes (1-3) and cardiovascular disease (4-6). Physical activity interventions are frequently community based and traditionally follow one of three recognised design approaches including informational, behavioural and social, or environmental and policy (7). Exercise Referral Schemes (ERSs) which have grown in popularity, represent a combined design approach and seek to increase physical activity of those not meeting recommended guidelines and who experience, or are at risk of developing chronic health conditions that are positively influenced by physical activity (8). In general, ERSs are well structured but costly, requiring a cohesive approach from a multidisciplinary team involved in the identification, referral, instruction and monitoring of inactive individuals. The development and implementation of ERSs throughout the UK is guided by best practice recommendations developed by the National Institute for Health and Care Excellence (9,10). However, as guidelines, these do not impose legal requirements and therefore design, structure and delivery of ERSs have the potential to vary substantially. A key recommendation made by NICE was that ERSs should only target sedentary or inactive individuals currently managing or at significant risk of developing specific health conditions. In addition, NICE recommended that interventions be tailored to the individual and that appropriate outcome data should be collected to more effectively assess ERSs (10).

Audits of the provision of ERSs within the UK have highlighted variations in design, implementation, structure and evaluation of services (11,12). Variation among ERSs presents a challenge when performing researching and limit the ability to draw general conclusions. In order to more accurately establish the potential impact of ERSs on those who access the services, research is required to conduct detailed evaluations of ERSs that strictly align to best practice guidance. Multiple systematic reviews have been conducted on key outcomes such as physical

activity and health indicators including blood pressure, body mass, obesity measures, respiratory function and cholesterol levels (13-15). These reviews have concluded that evidence for the effectiveness of ERSs is inconsistent due primarily to large variation in ERS design and disparity in outcomes reported (16). Initially, research investigating ERSs tended to overlook important psychosocial parameters that could respond positively to physical activity (17). More recently, research has investigated a range of well-being outcomes, supporting the perspective that these measures may be more likely than physical outcomes to demonstrate change over short term ERS interventions (18). However, there is still limited research that corresponds with NICE guidelines to provide data across a broad range of outcomes (physical and psychosocial) to inform future practice.

UK wide comparisons of self-assessed general health have reported differences across the four home nations, including significantly higher incidences of conditions associated with cardiovascular disease (CVD) in adults within Scotland compared to England (19) and higher incidence of limiting long-term conditions reported for females in Scotland compared to England (19). Additionally, the British Lung Foundation (BLF) have highlighted the high prevalence of COPD within the Scottish population, with mortality rates higher than those for the UK generally (20). Geographical comparisons of health profiles can assist with identifying nation specific requirements and inform requirement for action. Indeed, following the devolution of responsibility for public health and NHS services, the four nations within the UK acknowledged the differing health requirements within their populations by instigating changes to service provision (19,21). However, despite recognition of different health profiles and devolution of control over services across the four nations, there has been limited consideration that best practice may need to be adapted to ensure relevance and success within the individual context.

The vast majority of ERSs studies that have been conducted in the UK are representative of England and Wales and not indicative of the Scottish or Northern Irish populations (16). Recent systematic reviews have also investigated barriers and facilitators to participation in ERSs (13,17) with findings being used to inform

guidance provided by NICE to promote physical activity throughout the whole of the UK (17). Again, relevance of these reviews is questionable for Scotland where only 6% of studies included in the review were conducted with a Scottish population. NHS Health Scotland (2012) identified that the biggest challenge facing Scotland's health was the growing gap in health inequality, with the difference between the health status of the highest socioeconomic and lowest socioeconomic groups wider in Scotland than any other country in Europe. In addition it has been recognised that the whilst the rates of incidence of cardiovascular disease (CVD), pulmonary disease and stroke are all improving, they are not improving at the same rates as the rest of Europe. Alongside the concerns surrounding these chronic conditions there is growing concern for newer issues associated with the mental health of the younger population.

In summary, it is clear that there is a need for research evaluating ERSs that have been specifically designed in accordance with best practice guidelines, and to increase the representativeness of the available evidence base covering all of the four home nations. Therefore, the aim of this study was to quantify the effects of a Scottish based exercise referral scheme (ERS) that aligned to best practice guidelines on a range of health-related factors including those associated with prevalent medical conditions in Scotland.

Methods

Study Design:

A longitudinal, repeated measures study design was employed, with data collected at three time points including baseline (week zero), midway (week six) and completion (week twelve) of the intervention. Three points of assessment were included in order to tailor individual prescription of exercise and monitor responses. The primary objective of the study was to quantify the effects of the ERS on those that completed the full twelve weeks by conducting a per-protocol analysis. Information regarding gender, age, adherence rates and medical conditions of participants are provided for additional context (Table 1). All data were collected from participants referred to a single ERS developed in Stirling, Scotland, between April 2013 and October 2015. The ERS was continually reviewed to ensure it aligned with best practice and adhered to recommendations provided by NICE according to draft documents and the final guidelines published in 2014. Due to constraints on resources no control group was included, thereby presenting a limitation in the research design.

Participants and Scheme Design:

Of the 631 referrals made to the scheme for a range of health complaints which met the referral inclusion and exclusion criteria (Table 2 & 3, respectively), 407 attended baseline assessment, 265 attended the midway assessment and 193 attended the post assessment (Figure 1). Factors such as illness, time constraints and changes in personal circumstances affected the number of participants completing the programme within their set twelve week period, often leading to extension in the duration of their engagement with the programme or non-attendance at one or more of the scheduled assessments. The statistical analysis for this study only included data from participants who attended a minimum of two assessment sessions at the time of reporting.

Outcome Variables:

Health Related Physical Fitness (HRPF) was assessed through clinical measures, including resting heart rate, blood pressure (systolic and diastolic), lung function measured through the ratio of forced expiratory volume over one (FEV1) and six (FEV6) seconds, peak oxygen uptake ($V0_2$ Peak) assessed during the 10

m incremental shuttle walk test (23), body mass and waist to hip ratio. Standard protocols were used throughout to minimise measurement error.

Functional Capacity was assessed using the five time sit to stand assessment, whilst the General Practitioners Physical Activity Questionnaire was used to assess physical activity participation (PA levels). In order to measure the participants' quality of life (QOL) the World Health Organization's QOL questionnaire was employed (WHOQOL), whilst the Profile of Moods State (POMS) was adopted to assess the total mood disturbance (TMD) for each participant as an insight to their mental wellbeing.

Statistical Analysis:

Growth curve analyses (GCA) were used to model each variable across the three time periods. Curves were fitted with the fixed effect of gender and up to a quadratic polynomial on all time terms. Sequentially, the null model, a linear time model, and a quadratic time model (each controlling for the effect of gender) were fitted. Improvements in model fit were evaluated using -2 times the change in log-likelihood and the asymptotic chi-squared distribution. GCA provided a more flexible approach in comparison to traditional ANOVA analyses, enabling data to be included from participants with missing values and thereby, more accurate parameter estimates to be obtained (24). To assess whether values were likely to be missing at random the mean values from the initial time point in any consecutive pair (baseline to midway, or midway to completion) were compared for participants that dropped out and those that continued. No significant differences in means were obtained for any of the time points across variables ($p>0.05$). Effect sizes (ES) were calculated to provide a dimensionless measure of change by comparing the difference in means from baseline to completion relative to the baseline standard deviation. All statistical analyses were conducted using the lme4 package (25) in the statistical environment R (R Core Team).

Results

A range of effects were obtained for HRPF variables. Non-significant effects of time were obtained for systolic and diastolic blood pressure [$\chi^2(1)=2.78$, $p=0.095$; $\chi^2(1)=2.86$, $p=0.091$, respectively] and resting heart rate ratio [$\chi^2(1)=3.17$, $p=0.075$]. In contrast, quadratic models of time were obtained for body mass, waist to hip ratio and FEV1/FEV6 ratio [$\chi^2(2)=42.05$, $p<0.001$; $\chi^2(2)=24.45$, $p<0.001$; $\chi^2(2)=9.91$, $p=0.007$, respectively] with the greatest improvements obtained between baseline and midway assessment. For the physical tests of $\dot{V}O_2$ peak and sit to stand, significant linear [$\chi^2(1)=63.39$, $p<0.001$] and quadratic effects of time [$\chi^2(2)=195.6$, $p<0.001$] were obtained, respectively, with the greatest improvements in sit to stand performance obtained between baseline and midway assessment.

Analyses of psychosocial variables revealed that mood disturbance scores demonstrated a linear decrease over time [$\chi^2(1)=12.3$ $p<0.001$]. Similar positive linear changes were also obtained for quality of life assessments with significant increases obtained for WHOQOL1 and WHOQOL2 scores [$\chi^2(1)=10.36$ $p=0.002$; $\chi^2(1)=43.70$ $p<0.001$, respectively]. Finally, results demonstrated that changes in physical activity levels were best described by a quadratic model with values increasing sharply between baseline and midway assessment and then plateauing over the final 6 weeks [$\chi^2(2)= 194.51$, $p<0.001$].

Discussion

The aim of this study was to establish the effectiveness over the short-term of completing a Scottish based ERS designed in accordance with UK wide best practice guidelines. The results demonstrated that as a group, those that adhered to the intervention experienced significant mean improvements in the majority of HRPF outcomes and all psychosocial outcomes measured. Significant mean improvements were obtained for outcome measures (FEV1/FEV6 ratio and $\dot{V}O_2$ peak) associated with prevalent medical conditions in Scotland including respiratory and cardiovascular diseases, respectively. In contrast, the results reported here failed to demonstrate significant mean improvements in blood pressure. Findings from a meta-analysis reviewing random control trials lasting ≥4 weeks (26) reported that whilst endurance and dynamic resistance training in isolation affected blood pressure, combination training did not induce significant improvements. With the present study employing a non-standardised, individualised mode of exercise focussed predominantly on combination training, this may have contributed to the findings obtained. In addition, Cornelissen and Smart (2013) considered patients in subgroups based on their blood pressure and the diagnosis of hypertension. In particular, patients diagnosed as hypertensive experienced the greatest influence of exercise on blood pressure (26). Analyses completed in the present study were focused on the population as a whole and therefore, the impact of the ERS on blood pressure may have been influenced by the inclusion of participants with blood pressure within the normal range.

Changes in body composition reported in the present study through reductions in mean body mass and waist to hip ratio demonstrated significant effects of time. The GCA revealed different patterns of change between the body composition measures, with body mass following a linear reduction over the twelve-week intervention, whereas waist to hip ratio demonstrated a greater reduction in the first six weeks of the intervention compared with the final six weeks. A systematic review and meta-analysis on the impact of ERSs (16) reported similar significant but small magnitude changes in body composition measures to those reported here. The review also concluded that similar improvements were obtained through alternative physical activity interventions including walking programmes and usual care, where participants were provided

with simple advice on physical activity (16). Collectively, these findings suggest that ERSs do not offer any additional benefits to participants over alternative forms of treatment. The use of GCA in the present study provides additional insight into trends across the intervention. In particular, the correlation between random effects included in the model demonstrated that those individuals with the largest values for body mass and waist to hip ratio at baseline tended to experience the greatest reductions over time. Similar to the consideration of blood pressure, this trend may be explained through recognition of the variety of referral conditions and the individualistic nature of the exercise prescription underpinning ERSs. It is to be expected that individuals who are referred for weight loss, will be prescribed a programme of exercise to target weight loss and improvements in body composition, whilst those referred for alternative health reasons may not have weight loss as a priority of their exercise programme. It should be noted that for all HRPF variables negative correlations were obtained indicating that those who experienced the greatest improvements tended to commence the ERS with the least desirable profile for the specific outcome.

The greatest effects from participation in the ERS were obtained for the functional capacity sit to stand test. Large (ES=0.86) and moderate to large (ES=0.67) effect sizes were obtained for males and females, respectively. In addition, the improvements in sit to stand scores were found to be quadratic with the greatest reductions observed in the first six weeks between baseline and mid-testing. Given the size of the effect statistics in comparison to other variables it is possible that improvement may be partially attributed to a learned effect due to non-inclusion of familiarisation sessions prior to baseline testing.

Small to moderate effect sizes were also obtained for psychosocial outcomes including mental wellbeing (TMD), and quality of life, specifically the participants' perceptions of their quality of life (WHOQOL 1) as well as perceptions of their own health (WHOQOL 2). Significant reductions in mean values for TMD were linear, indicating that participants experience a consistent improvement in their mental wellbeing over the full twelve weeks of the intervention. Similar results for both WHOQOL 1 and WHOQOL 2 were obtained, with linear changes demonstrating consistent increases over the twelve-week intervention. Collectively, these results for the psychosocial outcomes adds support to the

hypothesis that ERSs can positively influence the mental wellbeing and quality of life of those who engage with the intervention. Similar findings have been reported in previous studies conducted on ERSs with psychosocial outcomes such as physical self-worth and perceptions of physical health (27) and depression (28-30). However, there are inconsistencies, with some studies reporting non-significant improvements in quality of life measures following an ERS intervention (28). These differences reported are most likely due to factors such as a lack of standardised outcomes measures, making comparison and collation of results challenging.

As to be expected, the results of this study demonstrated that adherence to the ERS resulted in increased levels of PA participation. The effect of time was found to be non-linear indicating that participants increased their physical activity levels over the twelve-week period, but the greatest improvements were obtained in the first six weeks. Comparable results have been reported in previous studies incorporating per protocol analyses of ERSs (30-32). Additional consideration of these studies and their findings in the review by Pavey et al. (2011) indicated that results should be interpreted with caution, as when data from all individuals referred to the ERSs were included, the findings suggested that there was no difference between ERSs and usual care.

In conclusion, the results of this study demonstrate that an ERS adopting the UK best practice guidelines can positively influence outcomes aligned to the health concerns of the Scottish population. The improvements identified in FEV1/FEV6 ratio suggests that participation can lead to improvements in lung function, and with increased incidence of COPD in Scotland compared to the rest of the UK, supports the role of such interventions in tackling specific Scottish health concerns. Additionally, the results presented here demonstrated mean improvements in $V0_2$ peak suggesting that cardiovascular fitness, which is another area of health concern in Scotland, can also be positively influenced. Finally, one of the main findings of this study is the large variability in changes in all outcome measures between the different time points. Further research is required to determine if this variation is primarily related to the individualised goals of each participant, or if there are other structural elements associated with the design and implementation of ERSs that require improvement. Additionally, given the

findings of this study to support the use of ERSs with a Scottish population in the short-term, longer-term studies investigating maintenance of increased physical activity on completion of the intervention and the factors that may influence such a transition are required.

Acknowledgements

Acknowledgement must be given to the Health and Wellbeing Team based at Active Stirling and the instructors based at The Peak in Stirling, with specific acknowledgement of those involved in the running and delivery of the exercise referral scheme namely Dawn Wilkie, Friederike Klinghammer and Christina Freaks for their assistance with data collection.

Author Statement

Ethical approval was granted from Robert Gordon University, School of Health Sciences, School Research Review Group (SRRG) reference code SHS/PG/12/36. Funding was proved by Active Stirling for a one year studentship in order to conduct the research. None of the authors declare any competing interests in the research undertaken.

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Table and Figure legends

Figure 1: Participant flow diagram

(Top) Table 1: Characteristics of participants at point of referral and attendance of baseline assessment (values expressed as proportions)

(bottom): CV: Cardiovascular condition; R/P: Respiratory/Pulmonary condition; Msk: Musculoskeletal condition; WM: Weight management and endocrine conditions; MH: Mental health condition; Neur: Neurological condition.

Table 2: Inclusion Criteria for Referral

Table 3: Exclusion Criteria for Referral

(Top) Table 4: Summary statistics of physical test variables across intervention. Data presented as means ± standard deviations

(bottom) SBP = systolic blood pressure. DBP = diastolic blood pressure. RHR = resting heart rate. FEV = forced expiratory volume. ES = effect size. Corr = correlation between intercept and slope random effects.

(Top) Table 5: Summary statistics of physical test variables across intervention. Data presented as means ± standard deviations

(bottom) ES = effect size. Corr = correlation between intercept and slope random effects.

(Top) Table 6: Summary statistics of psychosocial variables across intervention. Data presented as means ± standard deviations

(bottom) POMS = profile of mood states. WHOQOL = World Health Organization quality of life. PA Level = physical activity level. ES = effect size. Corr = correlation between intercept and slope random effects.

Table 1

Characteristics	Proportions						
Referred (n=631)							
Gender	Male: (.39)		Female: (.61)				
Age	16-24: (.07)	25-34: (.08)	35-44: (.16)	45-54: (.23)	55-64: (.22)	65-74: (.18)	75+: (.07)
Condition	CV: (.04)	R/P: (.05)	Msk: (.35)	WM/E: (.23)	MH: (.11)	Neur: (.08)	Other: (.14)
Baseline (n=407)							
Gender	Male: (.40)		Female: (.60)				
Age	16-24: (.06)	25-34: (.07)	35-44: (.15)	45-54: (.22)	55-64: (.23)	65-74: (.20)	75+: (.07)
Condition	CV: (.04)	R/P: (.05)	Msk: (.33)	WM/E: (.23)	MH: (.10)	Neur: (.08)	Other: (.15)

Table 2

In order to be eligible for the ALL programme the following inclusion criteria must be met. These criteria will be checked both by the referrer at the point of referral and by the ALL coordinator upon receipt of the referral form.

- Patients being referred must be 16 years old or older
- Patients must be currently living a sedentary lifestyle and therefore failing to achieve the recommended levels of physical activity as specified in the 'Start Active, Stay Active' report.
- Patients must not have achieved the previously mentioned national recommended levels of physical activity for at least the previous 6 months.
- All individuals being referred to the scheme must be presenting with a condition that is classified as either low or medium risk by the inclusion criteria categories for the ALL programme.
- Risk stratification of conditions has been developed using the Joint Consultative Forum 'Professional and
- Operational Standards for Exercise Referral. 2011' which adopts the 'Irwin and Morgan Risk Stratification Tool'.
- Patients being referred must have a referral form completed by a medical/health care professional who has full access to their medical history.

Table 3

All referral forms received by the ALL coordinator will be checked for eligibility against the specific exclusion criteria as outlined below:

- Patients in the high risk category outlined by ALL will not be eligible for referral to the scheme. Those who fall into this category should be advised to seek further medical assessment and be sign posted to alternative schemes suitable for their condition (such as Cardiac Rehabilitation Programmes)
- Patients who are referred and are currently diagnosed with more than one condition will be subject to the risk stratification criteria and must be deemed safe to participate in the scheme
- Any patient presenting for referral that has a current active membership or access subscription at any of the Active Stirling facilities, or has done so in the last 6 months, will not be eligible for the scheme
- There are certain absolute contra-indications for participation in physical activity which if present will mean immediate exclusion from the ALL programme:
    - Unstable Angina
    - Resting systolic Blood Pressure >180mmHg
    - Resting diastolic Blood Pressure >100mmHg
    - Significant drop in blood pressure during exercise
    - Uncontrolled resting tachycardia >100bpm
    - Unstable or acute heart failure

Table 4

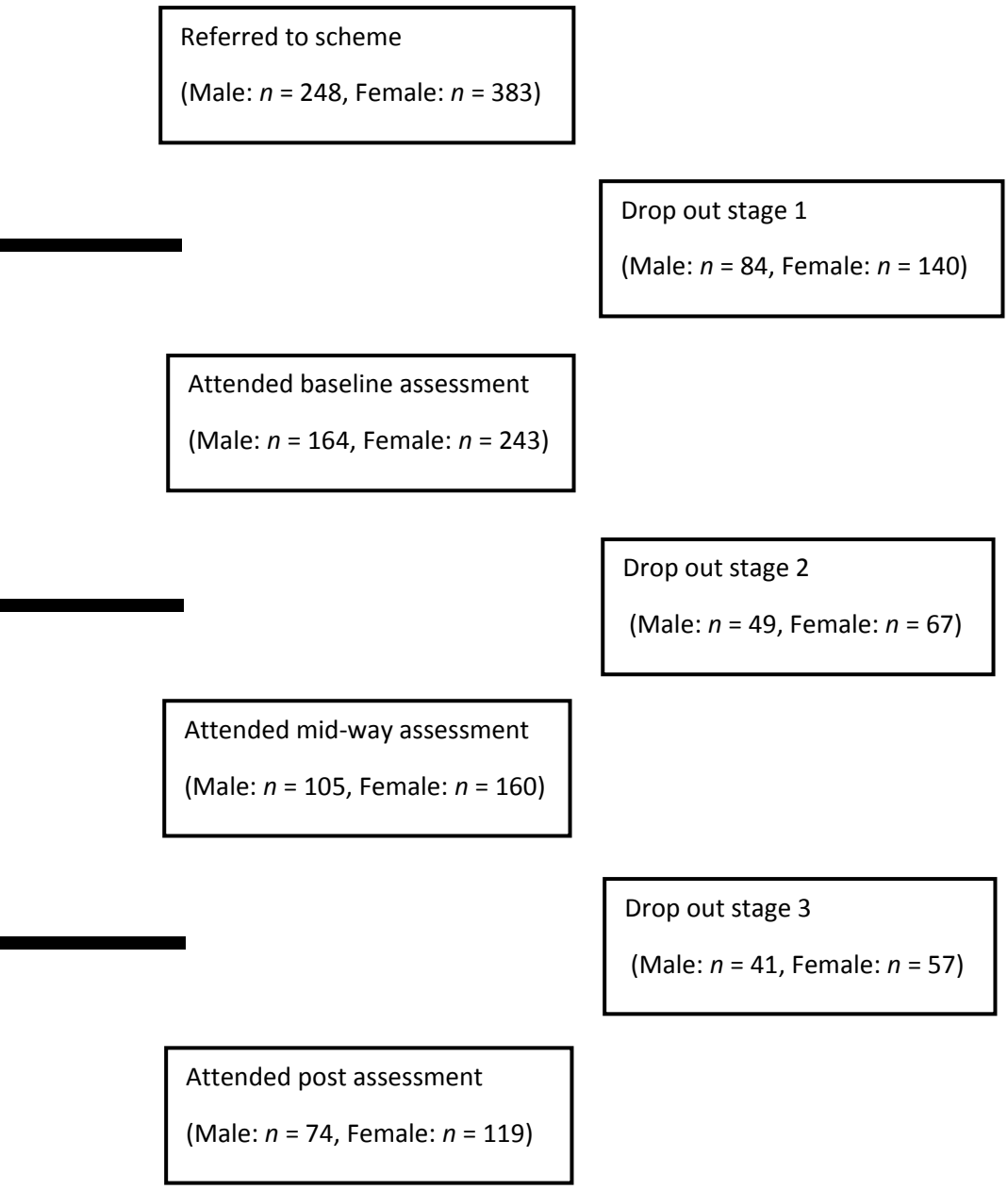
Variable	Gender	Pre	Mid	Post	Pre-mid change	Mid-post change	ES Pre-post	Corr
SBP (mmHg)	Male	137 ± 17 n=109	135 ± 16 n=92	130 ± 16 n=85	-2.2 ± 14.8 n=91	-3.9 ± 12.6, n=78	-0.40	-0.35
	Female	129 ± 20 n=166	129 ± 18 n=140	131 ± 18 n=130	-0.2 ± 14.1 n=140	2.0 ± 16.3 n=118	0.06	-0.63
DBP (mmHg)	Male	87 ± 10 n=109	87 ± 11 n=92	84 ± 8 n=85	-0.16 ± 11.4 n=61	-2.6 ± 10.7 n=52	-0.31	-0.45
	Female	87 ± 13 n=166	87 ± 11 n=140	87 ± 10 n=130	-0.9 ± 11.8 n=140	0.02 ± 11.2 n=118	-0.01	-0.50
RHR (bpm)	Male	75 ± 13 n=109	76 ± 15 n=92	73 ± 13 n=85	1.2 ± 9.6 n=91	-3.1 ± 11.4 n=78	-0.15	-0.46
	Female	79 ± 12 n=165	78 ± 13 n=138	78 ± 12 n=129	-0.6 ± 11.5 n=137	-0.19 ± 11.7 n=115	-0.08	-0.51
Mass (Kg)	Male	99 ± 28 n=111	98 ± 25 n=93	97 ± 23 n=92	-1.2 ± 2.9 n=93	-0.38 ± 2.5 n=87	-0.06	-0.36
	Female	86 ± 21 n=164	85 ± 21 n=146	84 ± 20 n=133	-0.76 ± 1.8 n=145	-0.54 ± 2.2 n=128	-0.07	-0.24
Waist / Hip ratio	Male	0.98 ± 0.08 n=107	0.98 ± 0.08 n=90	0.98 ± 0.08, n=89	-0.002±0.03 n=89	-0.003±0.03 n=85	-0.07	-0.24
	Female	0.87 ± 0.07 n=161	0.86 ± 0.06 n=143	0.85 ± 0.06 n=134	-0.013±0.03 n=142	-0.003±0.03 n=128	-0.20	-0.30
FEV1 / FEV6	Male	0.81 ± 0.12 n=99	0.84 ± 0.11 n=83	0.84 ± 0.10 n=85	0.02 ± 0.08 n=75	0 ± 0.09, n=73	0.13	-0.44
	Female	0.86 ± 0.09 n=151	0.87 ± 0.09 n=122	0.87 ± 0.09 n=131	0.01 ± 0.07 n=110	0 ± 0.04, n=105	0.09	-0.42

Table 5

Variable	Gender	Pre	Mid	Post	Pre-mid change	Mid-post change	ES Pre-post	Corr
Sit to Stand (s)	Male	15.2 ± 4.2 n=66	13.6 ± 5.4 n=56	12.3 ± 4.7 n=56	-2.2 ± 2.0 n=48	-1.5 ± 1.8, n=48	-0.86	-0.71
	Female	15.4 ± 5.3 n=114	13.1 ± 5.2 n=90	12.0 ± 4.3 n=97	-2.1 ± 2.2 n=82	-1.5 ± 2.0, n=76	-0.67	-0.73
$\dot{V}O_2$ peak ($l \cdot min^{-1}$)	Male	13.2 ± 3.6 n=30	13.4 ± 3.4 n=22	14.1 ± 3.4 n=24	0.65 ± 0.87 n=17	0.74 ± 1.1 n=20	0.46	0.08
	Female	12.4± 2.8 n=57	13.1± 2.5 n=35	13.7± 2.7 n=45	0.70 ± 0.85 n=31	0.93 ± 0.87 n=29	0.53	-0.37

Table 6

Variable	Gender	Pre	Mid	Post	Pre-mid change	Mid-post change	ES Pre-post
POMS TMD	Male	54 ± 28 n=68	49 ± 28 n=45	46 ± 26 n=47	-7.6 ± 25.2 n=41	-0.7 ± 20.1 n=40	-0.37
	Female	63 ± 37 n=112	52 ± 30 n=74	52 ± 33 n=81	-6.3 ± 25.1 n=72	2.2 ± 25.7 n=75	-0.13
WHOQOL1	Male	3.6 ± 0.8 n=62	4.0 ± 0.7 n=43	3.9 ± 0.8 n=45	0.35 ± 0.72 n=37	-0.16 ± 0.59 n=38	0.31
	Female	3.9 ± 0.8 n=108	4.0 ± 0.7 n=75	4.1 ± 0.7 n=77	0.01 ± 0.65 n=69	0.14 ± 0.66 n=58	0. 15
WHOQOL2	Male	2.6 ± 0.9 n=62	3.3 ± 0.9 n=43	3.4 ± 0.9 n=44	0.43 ± 0.76 n=37	0.05 ± 0.78 n=37	0.61
	Female	2.5 ± 1.1 n=107	3.0 ± 1.0 n=75	3.3 ± 0.9 n=76	0.33 ± 0.76 n=68	0.25 ± 0.71 n=58	0. 53
PA Level	Male	1.86 ± 1.14 n=90	3.17 ± 0.91 n=65	3.16 ± 0.97 n=69	1.3 ± 1.4 n=63	-0.03 ± 1.5 n=61	1.32
	Female	1.82 ± 1.06 n=136	3.24 ± 0.94 n=90	3.17 ± 0.97 n=103	1.34 ± 1.1 n=87	-0.1 ± 0.9 n=76	1.15


Referred to scheme
(Male: n = 248, Female: n = 383)
Drop out stage 1
(Male: n = 84, Female: n = 140)
Attended baseline assessment
(Male: n = 164, Female: n = 243)
Drop out stage 2
(Male: n = 49, Female: n = 67)
Attended mid-way assessment
(Male: n = 105, Female: n = 160)
Drop out stage 3
(Male: n = 41, Female: n = 57)
Attended post assessment
(Male: n = 74, Female: n = 119)