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Enhancing regular physical activity and relapse prevention through a 1-day therapeutic patient education workshop

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Abstract

Physical activity (PA) is a key component in the management of chronic diseases such as type 2 diabetes and obesity. Yet over half of patients who adopt PA programs do not maintain them at 6 months. To motivate the adoption and maintenance of regular PA among our patients, we developed a 1-day outpatient motivational workshop based on well-known theoretical frameworks.

OBJECTIVE: To evaluate the effectiveness of the motivational workshop through total and activity-specific energy expenditures (EE), as well as body mass index (BMI).

METHODS: Patients completed a validated self-administered quantitative PA frequency questionnaire at baseline and at one year. Stages of change and relapse risk were identified at baseline.

RESULTS: 25 subjects, mean (SD) age 48 years (13), BMI 34.1 kg/m² (6.9), completed pre/post evaluations. At baseline, 73 % of the subjects reported regular activities of daily living and 52% of the subjects reported regular formal exercise sessions. Using total and activity-specific EE, we identified 69% as sedentary. A relapse risk was recognized in 76% of subjects. Paired t-tests showed statistically significant ($P<0.05$) reductions in weight and BMI, and a significant increase in high intensity exercise EE. Total EE showed no difference. Among the baseline sedentary subjects, 39% became active.

CONCLUSION: This tool is effective in decreasing sedentarism and fosters physical activity maintenance in active subjects.

PRACTICE IMPLICATIONS:

This motivational workshop provides an example of translational interventions from multiple theoretical models to clinical practice.

1. Introduction

Regular physical activity (PA) is a key component of the management of chronic metabolic diseases such as diabetes and obesity. PA not only has direct impacts on body composition and weight, but also on many metabolic mediators (e.g., insulin sensitivity, fat oxidation), as well as psychological mediators (e.g., self esteem, body image, self efficacy). In addition to playing an important role in long term weight management, regular PA provides other health benefits such as an increase in cardio-respiratory fitness and the reduction of the relative risks for all-cause morbidity and mortality¹.

Current public health recommendations are similar across different governments and health organizations². In Switzerland the recommendations have been organized into two levels³. The first level corresponds to 30 minutes per day of movement integrated into everyday life (“lifestyle activities” or “activities of daily living”). The second level corresponds to organized sessions of programmed endurance exercises 3 times per week for 20 to 60 minutes per session, plus a combination of strength and flexibility training twice a week.

For non-athletic individuals, the amount of PA needed to achieve health benefits follows a dose response curve: the greater the amount of PA expended, the greater the health benefits^{4,5}. Many modes and strategies for achieving health-enhancing levels of PA have been studied, for example comparing lifestyle activities to structured exercise⁶, multiple short bouts versus one continuous bout⁷, and use versus non-use of home exercise equipment⁴. In a recent study, Jakicic et al⁸ suggest that the most important measure of exercise is neither the time spent nor the intensity of a specific PA, but the total energy expenditure (or “total volume”), whatever the types of PA performed.

Many studies have confirmed the importance of exercise for long-term weight loss maintenance. Furthermore, the amount of weight loss maintained seems to be proportional to the

amount of PA performed. Because of this dose-response effect, a drop in the amount of exercise and PA performed is synonymous with weight regain, even for those who have previously succeeded in maintaining their weight loss over time⁹.

Unfortunately, more than half of obese and diabetic patients who adopt PA programs do not maintain them after 6 months¹⁰. To motivate the adoption and maintenance of regular PA among our patients, we developed a 1-day outpatient motivational workshop based on well-known theoretical frameworks for therapeutic education and behavior change. The aim of this study was to evaluate the effectiveness of this 1-day outpatient motivational workshop on the maintenance of regular PA at one year.

2. Material and methods

The one-day outpatient motivational workshop

A 1-day outpatient motivational workshop entitled “How to integrate physical activity in my treatment?” was developed by a multidisciplinary team of health care providers at the Geneva University Hospital Service of Therapeutic Education of Chronic Diseases (STECD). The team comprised physicians, dieticians, nurses, and behavior therapists, in conjunction with physical therapists in the Department of Physical Therapy. The workshop follows the existing framework of other STECD outpatient programs based on a methodologically structured intervention¹¹. The overall program is illustrated in Table 1.

During the workshop, each patient participates in a group class with approximately 10 other patients. He/she undergoes two individual sessions (one intake assessment and one discussion at the end of the day). The patient also participates in two small group workshops (total 2 to 4 patients) targeting specific issues.

The general objectives of the 1-day motivational workshop are to help the patient progress towards the adoption of a regular PA program corresponding to at least the first level of the Swiss recommendations³, to maintain it in the long-term, and to prevent relapse. Relapse is defined as the

return to sedentarity (defined below). In addition to the general objectives, depending on the patient's motivational state, the specific objectives are to: (i) Increase perceived benefits; (ii) Increase knowledge of the different modes and recommendations; (iii) Identify motivational barriers/obstacles; (iv) Enhance personal strategies for overcoming barriers/avoiding obstacles; and (v) Propose follow up in the network and/or an individualized support system.

The workshop integrates many well known theoretical frameworks and behavior change models. It incorporates the Systemic Approach of Therapeutic Patient Education¹² which includes the identification of the patient's needs, the educational diagnostic, the educational goal, the choice of the educational method, and finally the evaluation of the educational process. The content of each step is discussed and decided with the patient. Hence, the educational process is patient-specific. Due to time and organizational constraints the evaluation of the patient's needs, the educational diagnostic, and the educational goal for the day are completed during the intake assessment, while the choice of the method of education is ultimately decided by the staff. The content is given in a group structure, and the evaluation is performed at the end of the day.

In addition to the Systemic Approach of Therapeutic Patient Education¹², we included applications of the Health Belief Model¹³ such as the importance of increasing perceived benefits¹⁴,¹⁵. The afternoon small group workshops are stage-matched following the Stages of Change from the Transtheoretical Model¹⁶ applied to exercise behavior¹⁷. Specific barriers expressed by the patients (such as lack of time) are also included in the constructs of the afternoon workshops.

The importance of alternating between individual and group activities is emphasized in the workshop constructs to allow the interchange between patients based on educational models such as socio-cognitive conflict¹⁸. Finally, the afternoon small group workshops are not only stage-matched, but are also based on specific behavior change strategies and tools such as decisional balance¹⁹.

Description of the classes and small group workshops

2.2.1 Welcome and expectations

The introductory group session is hosted by one physician and one nurse. These two caregivers are responsible for the whole day and serve as references for all patients and the other caregivers. The daily schedule is presented and the team is introduced to the patients. The patients are then encouraged to introduce themselves and express their own expectations. These are written on a white board and kept visible throughout the day.

2.2.2 Group class “The different types of physical activity and their benefits”

The educational objectives for the course are have patients understand that there are many different types and levels of PA, to increase perceived benefits, and to link them to the patient’s own desired benefits. The class provides a common language for defining different physical activities and recommendations.

The class is highly participative. Examples are raised by the patients and discussed within the group in attempting to raise their consciousness or link their desired benefit with their own reality.

The class structure is as follows. After a brief introduction, the patients are invited to write on a green card one of the physical activities that they do, or did in the past, or would like to do. Then on a red card, they are asked to write one of the benefits that they had or that they think PA could bring them. When language or literacy is a barrier, one of the health care providers discusses the question with the subject and writes it on the card for them. The cards are then placed on a board along a continuum of PA ranging from no activity at all (sedentarity) to competitive sports. Each card is discussed one-by-one among the whole group. Additional ideas and comments are added to the board as they arise. Techniques such as reformulation and open questions are used to promote explication and further discussion between the patients.

At the end of the class a summary is given linking the different types of PA and their benefits, emphasizing the fact that a minimal quantity and quality is needed to achieve these benefits. The current public health recommendations are given with the main take-home message being that the

first step is to avoid sedentarity and engage at least in the first level of the recommendations for the activities of daily living.

2.2.3. Individual therapeutic patient education session

This individual meeting with each patient comprises both the intake assessment and the formal therapeutic education session; lead by a physician and a nurse (this pair of caregivers is termed a “binome”). The session follows three precise, predetermined parts and is conducted with a non-judgmental, empathic, and patient-centered attitude. Each patient is allotted a 45 minute period.

The first part is the patient’s PA assessment. The following four open ended questions are asked: (i) What constitutes a typical week day and a typical weekend day? (ii) Please specify the physical activity done: What? When? How? How much? (iii) Would you like to do something else? (iv) What are your motivations regarding the physical activity that you do or that you would like to do?

The second part involves discussing the patient’s current status and stage regarding PA. The patient is asked to locate themselves in the continuum of PA (using the same schematic employed in the class). The definition of each PA category is repeated if needed. The stage of change and the relapse risk are determined separately for the activities of daily living as well as the programmed exercises.

The third part looks at the personal barriers and obstacles to achieve regular PA and their first educational goal for the day.

At the end of this individual session, the binome summarizes what they have understood and discuss with the patient what will be profitable for the afternoon program. After the session, the binome completes the pre-formatted patients’ chart which includes a summary of each point that was discussed.

2.2.4. Dietetic workshop “What dietary changes are needed when doing physical activity?”

While each binome does two individual assessments back to back, a nutrition workshop is held concurrently so that the other patients are participating in the workshop at all times.

The objectives of the nutrition workshop are to briefly revisit the structure of a balanced diet, to adapt it (or not) to the level of PA performed, and to discuss the importance of proper hydration. This workshop is led by a dietician and nurse's aids. The format is based on an open discussion allowing the patients to express their beliefs, knowledge, and past experiences. Specific supplement guidelines for diabetic patients are given depending on their treatment and needs.

2.2.5. The “Objectives meeting”

While the patients eat, all the multidisciplinary staff participates in the objectives meeting in which each binome presents each patient, summarizing the individual interview, their stage of change, their barriers, and the educational objectives that have been discussed. This allows the staff to choose the afternoon workshops accordingly for the group of patients present in order to adapt it to their specific requirements. If necessary, the moderators of the afternoon workshops will discuss patient objectives or possible anticipated problems with the binome in more detail. .

2.2.6. Small group afternoon workshops

Two sessions of different parallel workshops take place, with 2 to 4 patients in each workshop. Each small group workshop lasts 45 minutes and corresponds to a precise stage of change or barrier. Nine specific workshops and their content have been pre-formatted (see Table 2). Each workshop has clear educational objectives and structure and is held by trained staff members.

Each patient undergoes two of these small group workshops selected by taking into account their educational objectives, stage of change, and barriers corresponding to the contract made earlier during the individual interview.

2.2.7. Group synthesis of the day

In this 30 minute group session, each patient summarizes what they have learned during the day and what is the main message that they will take home. The same binome who conducted the introductory session are the moderators of this discussion. The expectations given by the patients at the beginning of the day are reviewed and an updated assessment is made.

2.2.8. Individual departure discussion

In this 15 minute discussion with the same binome as during the morning individual assessment, each patient is asked to summarize their situation, reformulate their feelings, describe what has impacted them and the short-term goals and strategies that they will use. If needed, a support system in the network is organized or potential contacts provided.

After the patient's discharge, a medical report with a summary of the day is send to the general practitioner, diabetologist, or other health care provider for that specific patient.

Measurements

As the participants were an heterogeneous group regarding their age and comorbidities (obesity and/or type 2 diabetes and/or metabolic syndrome), referred and followed by our service or private practitioners, we chose to define the program evaluation based on indirect measures of PA, such as total energy expenditure and activity specific energy expenditure, and weight and body mass index (BMI).

Following informed consent, each patients was asked to complete the Physical Activity Frequency Questionnaire (PAFQ)²⁰ prior to their arrival . This is a French self-administered quantitative physical activity frequency questionnaire designed to assess total and activity-specific energy expenditure in an urban adult general population. This 7-day recall questionnaire lists 70 activities or groups of activates with their typical duration. It allows the evaluation of the total energy expenditure and of the energy expended by performing specific activities, including those of low and moderate intensity. Of particular interest was the identification of very common, low intensity activities such as household chores and occupational activities. As one of our objectives with the educational program was to motivate our patients to participate in activities of daily living, it was important to use a questionnaire assessing also this type of activities. The calculations derived from the PAFQ account for the age, sex , weight, and height of the patient. In addition, the PAFQ was developed and validated in Geneva and thus takes accounts for the specific cultural environment of our patients. It has been used as a monitoring system for public health campaigns²¹.

Sedentarism is defined as spending less than 10% of one's total energy expenditure in physical activities with an intensity of 4 times the basal metabolic rate or more, which corresponds to moderate physical activities²⁰. Thus, the PAFQ permits categorization of subjects into a dichotomous outcome (sedentary versus active) based on a quantitative measure. About 20 minutes are required to indicate the number of days and the number of hours per day that the subject performed in each activity. Each physical activity has a pre-assigned score indicating its intensity in terms of multiples of the person's basal metabolic rate²². To increase the accuracy of the questionnaire, the first author checked all the questionnaires upon the patient's arrival and requested further information about incomplete responses. The same questionnaire was sent through the mail one year after the workshop with a pre-stamped envelope; incomplete questions or further information were requested over the phone when necessary. All the questionnaires were analyzed by blinded staff in the Geneva University Hospital Division of Clinical Epidemiology.

In addition to the PAFQ, baseline data gathered during the intake assessments included the identification of the stages of change and the risk of relapse. The stages of change were identified by a 5-item closed-ended brief interview²³. The risk of relapse was identified through past attempts and failures, with the following yes/no question: "In the past, I have already done a regular physical program for at least 3 months and stopped". Weight and height were taken from the PAFQ questionnaire and thus are self-reported.

2.4. Statistical analysis

All statistical analyses were conducted using SPSS for Windows, version 13.0. Paired t-tests were performed between the pre- and post intervention data (at time 0 and after 1 year) at level of significance $\alpha=0.05$. Data are presented as mean (SD) or as mean (SEM).

3. Results

25 patients (16 women and 9 men) completed both the pre- and post intervention evaluation out of the 26 that participated in the workshop.

3.1. Baseline Characteristics

The respective mean (SD) age and BMI at baseline were 48 (13) years and 41.1 (6.9) kg/m².

When regular PA was defined as activities of daily living of at least 30 minutes per days, 5 days per week (Figure 1a), we observed that 73 % of the subjects were already in the stages of change including Action and Maintenance, thus were already active, while 27% were in the first 3 stages of change (Precontemplation, Contemplation, and Preparation) and therefore were not participating in regular PA.

When regular PA was defined as “programmed exercise”, meaning a regular program of formal exercise sessions of at least 20 minutes 2 times per week (Figure 1b), 52% of the participants were in the Action and Maintenance stages of change, thus were already performing this type of exercise routine, while 48% of the subjects were in the first 3 stages of change and therefore were not performing regular programmed exercise.

A risk for relapse was identified in 19 subjects (76 %).

3.2. Pre-intervention (baseline) and Post-intervention (at one year) results

Results for the 25 subjects having completed pre-intervention (baseline) and post-intervention (at one year follow up) assessments are shown in Table 3. Although weight and BMI differed from the baseline in terms of statistical significance ($P = 0.049$ and 0.048 respectively), in clinical terms the mean weight and BMI were essentially maintained at the one year follow-up. Total energy expenditure, expressed both absolutely and relative to body weight, were also maintained. The percentage of calories expended in high intensity (at least 4 times the basal metabolic rate) activities such as brisk walking, significantly increased from 8% to 12.5% ($P = 0.048$).

The dichotomous outcome, sedentary versus active, was defined based on the quantitative evaluation of the total energy expenditure as described in the measurements paragraph regarding the PAFQ. At baseline 18 subjects out of 26 were classified as sedentary, but only 7 out of 25 were classified as sedentary at the one year follow-up (Figure 2).

4. Discussion and Conclusion

4.1. Discussion

As reported in the literature^{24, 25}, care providers have an important role to play in promoting regular physical activity (PA) behaviors. In order to promote the adoption and the adherence of regular PA and support the effort of primary care physicians in Geneva, we developed an outpatient PA motivation workshop. As described by M.B. Kinzie²⁶, creating an education program for a particular health behavior requires translating behavior change theory into practice, choosing specific behavior models from the multitude of theoretical frameworks, and selecting the specific instructional strategies to employ. Basing on well-known behavior change theories and our many years of experience in therapeutic patient education, we designed the present 1-day physical activity motivational workshop. The target population for this program was a heterogeneous population of patients, coming not only from diverse health care practices but also suffering from diverse chronic diseases (e.g., diabetes, obesity, hypertension and other components of the metabolic syndrome), in different stages of their disease and management, and with different complications (including knee osteoarthritis, peripheral neuropathy, vegetative neuropathy). In addition, while some of the patients were already active, others were sedentary with different stages of readiness to change towards an active lifestyle. Therefore the rationale for our 1-day outpatient physical activity motivational workshop was not only to provide an educational program to promote adherence towards regular physical activity but also to prevent relapse.

Because of the heterogeneity of the particular sample that we studied, we decided to use indirect measures (such as energy expenditure and weight) instead of behavioral markers to evaluate the workshop. As the average energy expenditure reflects all the movements that a person makes throughout the day, including the activities of daily living, we extrapolated that it indirectly reflects the impact of our motivational workshop. If this workshop had a positive impact on a patient, for example raising his awareness, this patient would probably improve or maintain their average energy expenditure. This extrapolation is one of the limitations of our study, but was clearly a choice based on the structure of our service and the inability to control all the possible

biases and differences among this heterogeneous patient population. On the other hand, this heterogeneity can also be seen as a strength of this study because it permits some generalizability to other health care settings.

Another limitation to take into account is that the PAFQ questionnaire that we used is self-reported (including height and weight). As advised by the creators of the PAFQ, all questionnaires were checked with the patient at baseline and explanations were requested when needed. If a subject tended to over-or under-report, we postulate that they were doing the same at the two time-points, and thus potential measurement error due to self-reporting would be minimized by the design of this quasi-experimental pre/post test study.

When using the patient's stage of change for the activities of daily living (at least 30 minutes per day), we identified 7 subjects in the first 3 stages of change and 19 in the last 2 stages of change. Based on these numbers, we would have identified 27% of the subjects as sedentary and 73% as active. In contrast, when using the quantitative data from the PAFQ to categorize the outcome with a dichotomous variable (sedentary versus active) based on the subject's total energy expenditure and percentage spent in high intensity physical activities (see Section 2.3.), we identified 69% of the subjects as sedentary. This further supports our decision to use the stages of change to assess the subjects' readiness to change and to orient the educational process (stage-matched intervention), but not as an indirect measure of the physical activity level.

Unfortunately, an expanded literature search has not allowed us to compare this motivational and educational workshop with others, as the programs are rarely described. For this reason, we wanted to present in detail each step of this workshop and open the field to sharing similar practices and evaluating their effectiveness.

4.2. Conclusion

At one year post intervention, this sample of 25 subjects did not reduce their total energy expenditure despite a small but statistically significant weight reduction. This result speaks towards

the maintenance of their overall level of physical activity. Due to the fact that a majority of our subjects were active at baseline, this motivational tool seems robust in preventing relapse and thus sustaining physical activity levels at one year.

In addition, 39% of the patients who were sedentary at baseline became active. In other words, to move 4 sedentary towards becoming active with this motivational workshop, we needed to treat 10 sedentary subjects.

4.3. Practice implications

Although this 1-day motivational workshop was developed to fit the precise setting of our clinical service, this educational program to promote physical activity adherence and maintenance over time could be readily translated to other health care settings. An example of minor format modifications for conducting the workshop in private offices would be to partition it into multiple educational interactions of lesser duration. Our study provides an example of translational interventions from multiple theoretical models to actual clinical practice.

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Table 1: Overall view, structure, specific aims and theoretical links of the 1-day outpatient motivational workshop “How to integrate physical activity in my treatment?”

<i>Time / Structure</i>		<i>Specific Aims</i>	<i>Theoretical Link</i>
8.30	Group	Welcome and Expectations	
9	Group	“The different types of PA and their benefits”	Health Belief Model (perceived benefits), Informative and participative knowledge (group interchange)
10.30	Individual	TPE session with a nurse and a physician	Educational diagnostic, Stages of change, Identification of barriers, Educational goal
	Small group	“What dietary changes are needed when doing physical activity?”	
12	Interactive Buffet for Patients		
	Staff Meeting	Choice and organization of the afternoon activities	Educational methods adapted to stage of change and barriers
13.30	Small group	Workshop corresponding to educational objectives	Social-cognitive model, Decisional Balance and other behavior strategies, Specific to stage of change
15.45	Group	Synthesis of the day	
16	Individual	Departure discussion	Evaluation, support/network

Table 2: The small group afternoon workshops

<i>Title of the workshop</i>	<i>Stage of Change</i>	<i>Barriers and Obstacles</i>	<i>Strategies used in workshop</i>
1. The priorities of my life	Precontemplation Contemplation	- Denial - Is not conscious of the problem - When physical activity is not a priority - Defensive reaction - Limited confidence	- Raise consciousness - Visualization of the different priorities of his/her life - Visualization that changing one priority does not always impact other
2. What are my advantages and my inconveniences of doing physical activity	Precontemplation Contemplation	- Lack of knowledge - Lots of negatives - Is willing to think about - Low confidence	- List of pros and cons - Visualization of their importance and weight
3. External resources	Precontemplation Contemplation Preparation	- Failed past attempts - Low confidence of his/her ability to change	- Structure, identify and organize his/her own external resources and support system
4. The decisional balance	Preparation	- Risk of going into action to early - Underestimation of problems that can be encountered	- Personalize the message using very concrete programs of physical activity that the patient wants to do or as tried in the past
5. My little inner voices	Action Maintenance	- Negative thinking - Comparison to others - Other automatic thoughts	- Raise consciousness of his/her thoughts and challenge them during physical activities
6. Learn to dose my effort	Action Maintenance	- Discouragement, physical or mental fatigue - Risk of dissatisfaction linked with the lack of skills - Monotony	- Learn to adapt the intensity of the physical activity - Menu of intensities (diversification)
7. I have no time	Action Maintenance	- Monotony - No time	- The wheel of the 24h day (visualization of the time spent in different situations) - Diversification of activities
8. How to maintain my physical activity in unexpected situations	Maintenance	- Relapse prevention in unexpected situations (sickness, vacation)	- Anticipation of specific scenarios by role play
9. My goal is...	Preparation Action Maintenance	- Structure the action - Precise a specific goal - Relapse prevention	- Personalized goal - Oriented short or medium term program

Table 3: Pre and post intervention results

Variables	Baseline	1 year follow-up
Weight (kg)	95.3 (3.0)	93.2* (3.0)
Body Mass Index (BMI) (kg/m ²)	34.1 (1.3)	33.2* (1.3)
Total energy expenditure/day (kcal)	2961 (103)	2918 (117)
Total energy expenditure/body weight/day (kcal/kg)	31.5 (1.0)	31.6 (1.0)
% of energy expenditure/day from high intensity exercise	8.0 (1.6)	12.5* (2.0)

Data are presented as mean (SEM).

* Pre vs. Post $P < 0.05$

Figures legends

Figure 1:

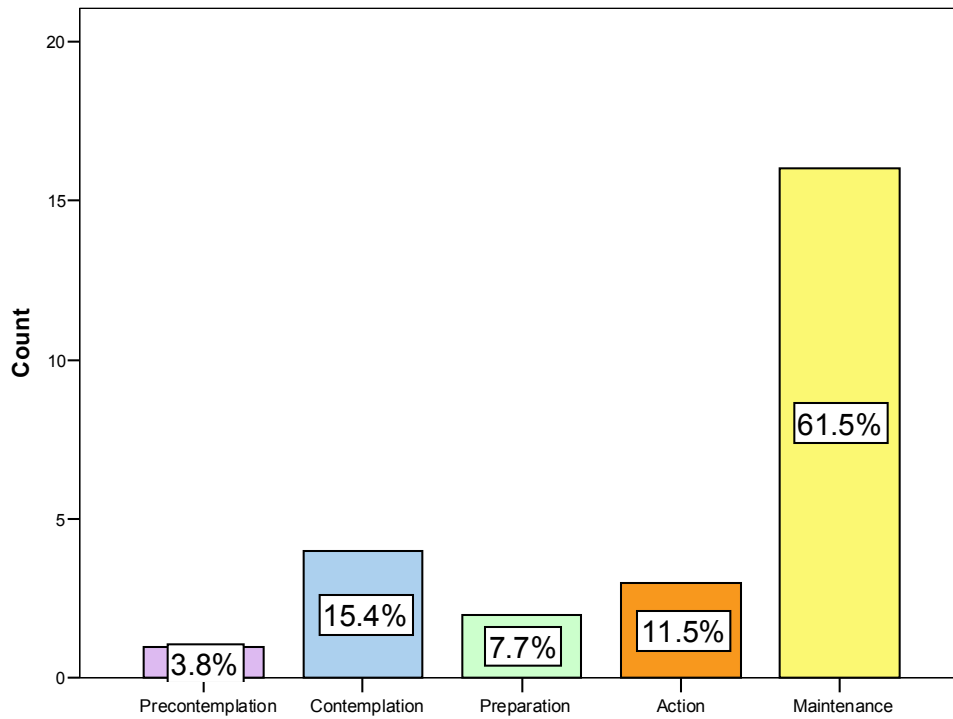
Stages of Change: baseline frequency distribution. a) Activities of daily living. b) Programmed exercise.

Figure 2:

Proportion of subjects categorized as sedentary or active, at baseline and at one year (defined by the PAFQ).

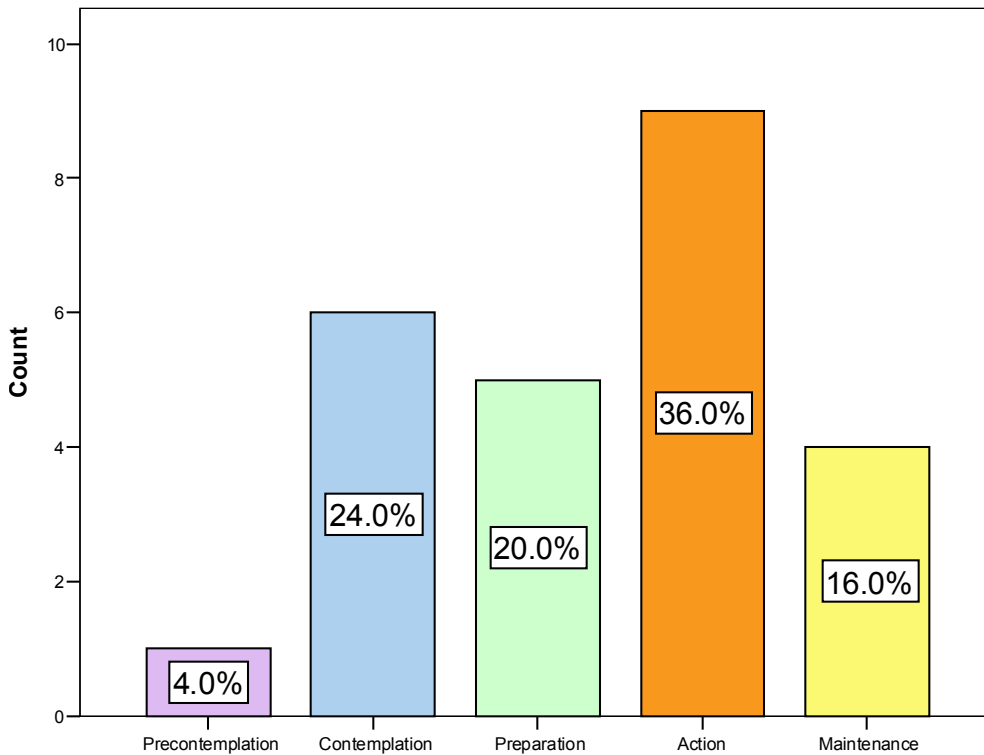
Figure 1: Stages of Change: baseline frequency distribution

a) Activities of daily living



Stages of change for Activites of Daily Living

b) Programmed exercise



Stages of change for Programmed Exercise

Figure 2: Proportion of subjects categorized as sedentary or active, at baseline and at one year (defined by the PAFQ)

