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Dissertação do Mestrado em Psicologia da Saúde
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PHYSICAL EXERCISE ADHERENCE: THE ROLE OF MOTIVATION, REGULATORY EFFICACY AND COMPETING GOALS

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Ano de Conclusão: 2008

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Dissertação Orientada por Stan Maes, PhD (Leiden Universitait, Netherlands) e Supervisionada por Professora Doutora Isabel Leal (Instituto Superior de Psicologia Aplicada)

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Acknowledgements:

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Finally, I would like to thank two people, my mentor Maria João Gouveia and my partner João, for everything.

Errata:

Contents and page 19 (subtitle): Where it says "Hypothesis and results", it should say "Research questions and results".

Page 12, line 12: Where it says "were very satisfactory", it should say "were satisfactory".

Page 12, lines 17 & 18: Instead of "None of the scales violated the assumption of normality", the statement should be: "The scale *competing goals,* the subscales of the *Brief Symptom Inventory*, as well as the *life quality* and *health perception* items, violated the assumption of normality and variances homogeneity, for most exercise stages defined. Nevertheless, the power of the parametric tests, the large sample size, the analyses of the scatter plots and the difference between variances algorithms (<4:1) led to consider adequate the use of the parametric tests for data analysis purposes. Because the *competing goals* scores presented a higher non normal distribution, its results should be carefully interpreted".

Page 14, lines 5, 6, 7 & 8: The statement should be: "There were also significant differences between the different groups of exercise levels in terms of gender ($X^2_{(1,\ N=269)} = 13.927$, $p=.003$), 43.6% of the women in the study were non exercisers while 40.4% of the men were long term regular exercisers".

Page 17, Table 2: Where it says "Variância Explicada", it should say "Explained Variance".

Page 21, line 20: Where it says "present", it should say "presents". Also, instead of "respondent is recognized" it should say "respondents can be recognized".

Enquadramento:

A presente tese de dissertação é apresentada em formato de artigo científico. No entanto, dado o seu cariz académico, considerou-se importante apresentar informação mais pormenorizada ao nível metodológico, das questões de investigação e dos procedimentos estatísticos.

Resumo:

Introdução. Os elevados índices de inactividade nas sociedades ocidentais e o conhecimento científico dos benefícios da prática regular de exercício físico, contribuíram para o impulsionar da investigação das variáveis psicológicas que podem estar associadas à adesão, manutenção, abandono e resistência à prática de exercício físico. O presente estudo, adoptando uma perspectiva de auto-regulação do comportamento (Maes & Karoly, 2005), analisou a relação entre a prática de exercício físico e a motivação (extrínseca e intrínseca), eficácia auto-reguladora e objectivos competitivos com a prática de exercício físico.

Foi ainda objectivo deste estudo analisar a existência de diferenças nos níveis de fadiga, concentração, motivação, actividades diárias e sintomas psicológicos (problemas de sono, depressão e ansiedade), entre sujeitos com diferentes níveis de exercício físico.

Método. Participaram no estudo 269 sujeitos adultos (21-65 anos), de ambos os sexos, distribuídos por diversos grupos de acordo com os seus níveis de actividade física: inactivos, activos irregulares, activos regulares (até 24 meses) e activos regulares (há pelo menos de 24 meses). Utilizando metodologia de inquérito, o estudo consistiu na aplicação de um conjunto de questionários, num único momento, aos participantes. O processo de recolha foi feito por email/correio. Os níveis de exercício físico foram recolhidos através de questões acerca do historial de actividade física dos participantes. Os instrumentos utilizados foram o Alameda 7 (Schoenborn, 1985), Behavior Regulation for Exercise Questionnaire (Markland& Tobin, 2004), Regulatory Self-Efficacy Scale, Competing Goals Scale (Gebhardt & Maes, 1998), Checklist of Individual Strength (Vercoulen, Swanink, Fennis, Galama, Van der Meer & Bleijenberg, 1994) and Brief Symptom Inventory (Canavarro, 1999). Todos os instrumentos apresentaram, nesta amostra, boas propriedades psicométricas.

Resultados. Os resultados revelaram a existência de diferenças significativas nos níveis de eficácia auto-reguladora e motivação. Os sujeitos praticantes regulares de exercício físico apresentaram maior confiança na sua capacidade para ultrapassar barreiras à prática de exercício físico e regulação do comportamento mais autónoma, em comparação com os não praticantes e os praticantes irregulares. A quantidade de objectivos conflituantes com o exercício valorizados pelos indivíduos, apresentou igualmente diferenças significativas, neste caso, superior no grupo dos indivíduos inactivos. A análise discriminante efectuada extraiu uma função discriminativa

significativa entre grupos, constituída pelas variáveis motivação e eficácia auto-reguladora. Verificou-se ainda existirem associações significativas positivas entre o tipo de regulação do comportamento e os níveis de eficácia auto-reguladora em todos os grupos de exercício físico. Os sujeitos não praticantes de exercício físico apresentaram os níveis mais elevados de fadiga, ansiedade e problemas de sono e, os níveis mais baixos de motivação e concentração.

Discussão. Estes resultados contribuem para a compreensão dos factores psicológicos associados à prática de exercício físico. A investigação futura deverá examinar estas relações utilizando métodos longitudinais e de intervenção, de modo a observar de que forma estas variáveis permitem predizer modificações no comportamento de exercício físico ao longo do tempo. Considera-se que as intervenções dirigidas a aumentar os níveis de eficácia auto-reguladora, potenciar autonomia na regulação do comportamento (motivação intrínseca) e identificar e criar alternativas para objectivos competitivos, poderão ser úteis na promoção e manutenção da prática de exercício físico.

PALAVRAS-CHAVE: exercício físico, motivação, eficácia auto-reguladora; objectivos competitivos.

Abstract:

The high levels of inactive people in western societies and the well-known benefits of regular exercise, led researchers to study psychological variables that may be associated with exercise adherence, maintenance and also resistance. The present study examined the relation between physical exercise and *motivation* (autonomous and controlled regulation), *regulatory self-efficacy* and *competing goals* valued by individuals. Participants were 269 adults (21 to 65 yr). Comparisons were made between non exercisers, irregular exercisers, regular exercisers and long term regular exercisers (> 24 months). Results revealed that regulatory self-efficacy levels and autonomous regulation are significantly higher in long term exercisers in comparison to other (non-)exercise groups. The number of valued competing goals was significantly higher in the inactive group. There were significant positive correlations between regulatory self-efficacy and behavior regulation for all groups. Also, individuals that exercise at different levels present less fatigue, sleeping problems, somatization and anxiety symptoms, than non exercisers. This last group also presents lower levels of concentration and motivation. The results suggest that interventions aimed to increase regulatory self-efficacy and autonomy behavior regulation, as well as identifying and creating alternatives for competing goals with exercise, can be useful in promotion exercise initiation and maintenance. Future research should examine these relations using longitudinal and intervention methods to analyze how these variables affect exercise behavior changes.

KEY WORDS: physical exercise; exercise motivation; regulatory self-efficacy; competing goals.

Contents:

Introduction:

Research results are consensual that engaging in regular physical activity (i.e. participation in moderate activities such as brisk walking at least 5 days a week for 30 minutes a day) is crucial for the health and well-being of people of all ages (Weinberg & Gould, 2007).

Despite the well-known benefits of regular physical activity, 60% of the adults in the Western world do not exercise in a regular basis (Seefeldt, Malina & Clark, 2002). The most recent eurobarometer on physical activity (European Commission, 2006), revealed that over 40% of adults in 15 countries reported no moderate level of physical activity and only 18% reported to do physical activity at the recommended levels. In Portugal, 43% of the inquired, reported to walk 7 days a week for 10 minutes or more, but 52% reported no other moderate physical activity and 45% reported to spend 1 to 3h59 hours a day sitting.

To understand why people lead a sedentary lifestyle despite knowledge of the benefits of an active lifestyle, research has been focusing on the psychological models of behavior change, namely the self-regulation perspective (Maes & Karoly, 2005), that can be useful in the health promotion context.

From a self-regulation perspective, *exercise motivation*, *regulatory self-efficacy* and *competing goals with exercise*, are considered important factors of behavior change.

Physical Exercise Motivation

Self-Determination Theory (SDT) states that the reasons (controlled or autonomous) for individuals to pursue a certain behavior are crucial for its initiation and maintenance (Mullan, Markland & Ingledow, 1997; Deci & Ryan, 2007; Lutz, Karoly & Okun, 2008). On other words, individuals can have extrinsic or intrinsic motivation to pursue a certain behavior. Essential to the SDT is the notion that the two forms of motivation and behavior regulation are seen as a *continuum* from external to intrinsic motivation and that autonomous regulation or intrinsic motivation is associated with exercise maintenance. Autonomy, together with c*ompetence* and also *relatedness* are considered to promote internalization of the regulation of health behaviors (Ryan, Patrick, Deci & Williams, 2008).

Research has demonstrated that autonomous regulation is an important predictor of behavior initiation and maintenance (Mullan et al., 1997; Lutz, Karoly & Okun, 2008; Deci & Ryan, 2007; Markland, 1999; D'Angelo, Reid & Pelletier, 2007).

SDT also focuses on the importance of competence in the process of behavior change, considering that for internalization of regulation to occur, a person also needs to have the confidence and competence to change and overcome difficulties that occur. According to the theory, the perceptions of self-determination (perception of choice) moderate the effects of perceived competence on intrinsic motivation.

Regulatory Self-Efficacy and Physical Exercise

A review of 47 studies by Downs and Hausenblas (2005, *In* Weinberg & Gould, 2007), revealed as main reasons for not exercising: lack of motivation and energy, insufficient time, inconvenience, health issues, lack of social support and lack of money. Most of these barriers are internal rather than external barriers and can therefore be influenced. For example, "perceived lack of time", the most cited reason for not exercising, is frequently more a problem of schedule organization and prioritizing activities than a real time constraint. To understand the way people deal with barriers and to promote effective ways of overcoming them, research on *regulatory self-efficacy* has been conducted (McAuley & Mihalko, 1998; Marcus & Forsyth, 2003).

Generally, "perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given levels of attainment" (Bandura, 2000, p300). Therefore, people's perception that they can perform successfully a given behavior (i.e. self-efficacy) increases the likelihood that they will engage in that behavior (Marcus & Forsyth, 2003).

According to Bandura's Social Learning Theory (1986), self-efficacy is the most important mediator of behavior change and has been shown to be related to physical activity behavior. Furthermore, self-efficacy proved to be an important predictor of an increase in physical activity in several intervention studies (Marcus & Forsyth, 2003; Weinberg & Gould, 2007).

In the physical activity domain, two main forms of self-efficacy are distinguished: *task efficacy* and regulatory self-efficacy. The first represents the person's confidence to engage in specific exercise modalities or tasks, frequency and/or duration (McAuley & Mihalko, 1998). Regulatory self-efficacy refers to one's ability to initiate and persist with exercise when confronted with challenging or adverse situations (McAuley & Mihalko, 1998; Davis, Figueiredo, Fahy & Rawiworrakul, 2007).

Regulatory self-efficacy with respect to exercise, can thus be define as the confidence in ones ability to overcome exercise barriers, such as bad weather, being tired, etc. (Bandura, 1997, 2001).

Research findings indicate that regulatory self-efficacy is positively associated with exercise behavior (Dishman & Sallis, 1994; Marquez & McAuley, 2006; Marcus & Forsyth, 2003; Marshall & Biddle, 2001; Lewis, Marcus, Pate & Dunn, 2002; Davis, Figueiredo, Fahy & Rawiworrakul, 2007). Sniehotta, Scholz & Schwarzer (2005) in an intervention designed for cardiac rehabilitation patients, demonstrated that regulatory efficacy (named maintenance self-efficacy) was an important mediator between exercise intention and late physical activity. Also, in a study conducted by Resnick and Jenkins (2000) with older adults, higher levels of regulatory self-efficacy accounted for 30% of the variance in exercise activity.

Despite the evidence that efficacy beliefs and especially regulatory self-efficacy are significantly related to exercise behavior (i.e. individuals that exercise regularly have higher levels of confidence to be able to overcome barriers) and that regulatory self-efficacy is a predictor of future exercise behavior, other variables are also mentioned as important predictors of exercise. One of these is *competing goal with exercise*.

Competing Goals and Physical Exercise

Physical exercise, as well as other health behaviors, is a specific goal that individuals pursue, through various courses of action. At the same hierarchical level as physical exercise, are other personal goals (e.g. studying). These goals can influence each other positively or negatively (Riediger, Freund & Baltes, 2005). People have several goals, activities and tasks at the same time that require them to divide resources and this can be in some situations impossible to attain (Gebhardt, 2006). When equally desirable goals are in conflict, individuals may need to choose one goal to pursuit at a certain moment.

In a research conducted with nursing/care staff, (Gebhardt & Maes, 1998) differences in valued competing activities for exercise (e.g. staying at home, going for a drink, etc.) between different levels of reported physical activity, from non exerciser and not willing to exercise to those exercising regularly, were analyzed. Non exercisers anticipated to conflict with exercising regularly, significantly more highly valued activities, specially activities that take place at home (e.g. watching TV and doing household chore) and also social activities (e.g. visiting a friend). In a follow-up study (Gebhardt & Maes, 1998), the number of highly valued competing activities was an important predictor of regular exercise initiation and relapse to a sedentary lifestyle within the 12 months thereafter.

More recently, Karoly, Ruehlman, Okun, Lutz, Newton and Fairholme (2005) also demonstrated that conflicting activities with exercise are major obstacles to regular exercise. In fact, the adoption of a new health behavior depends not only of the perceived competence that individuals have in their ability to overcome difficulties that may occur, but also on the connections to other valued goals, that in case of high conflict may compromise the pursue of the health behavior.

Aim of the study

Research suggests that the adoption of a self-regulation perspective can be useful to understand and promote health behaviors. Therefore, this study aims to analyze the relation between physical exercise and psychological factors that can be important in the process of behavior regulation: motivation (autonomous and controlled regulation), regulatory self-efficacy and competing goals with exercise.

Research questions

This thesis attempts to answer the following questions:

(1) Does exercise motivation (controlled-autonomous regulation), regulatory self-efficacy and valued competing goals, differ between groups of (non-) exercisers?

(2) To what extent can exercise motivation, regulatory self-efficacy and competing goals adequately distinguish between groups of (non-) exercisers?

(3) Are exercise motivation, regulatory self-efficacy and competing goals associated?

(4) Do people in different groups of (non-)exercisers have different levels of fatigue, concentration, motivation and daily activity levels?

(5) Does depression, anxiety, somatic symptoms and sleeping problems, differ between groups of (non-)exercisers?

Method:

Participants:

269 adults, living in Portugal (81.4% from the Lisbon area, 10.3% from the Porto area and the others 8.4% from several regions of Portugal), between 21 and 65 years old. (M=33, 80; SD = 11.498). The study population consisted of 165 (61.3%) women and 104 (38.7%) men. In respect to the marital status, 118 (44.2%) were married, 133 (49.8%) were single, 10 (3.7%) were divorced and 6 (2.2%) were widowed.

In terms of occupation, 183 (70.4%) were employed, 59 (22.7%) subjects were studying, 9 (3.5%) were retired, 5 (1.9.%) unemployed and 3 (1.9%) domestic. Weekly working hours ranged from 8 hr to 84 hr (M=38,791; SD= 10.68).

From this sample, 53 (19.7%) participants reported to have medical problems, ranging from eyes (14 subjects) and joint (11 subjects) problems to breathing problems (3 subjects).

Participants were distributed through four groups representing different (non-) exercise levels. This distribution was based on the recent guidelines for physical activity (see *measures* section). The four groups are: a) *non exercisers* - individuals that are currently not doing any physical exercise (97 subjects – 36.1%) ; b) *irregular exercisers* – individuals that are doing some exercise but not enough to meet the regular exercise levels criteria (38 subjects – 14.1%); *regular exercisers*: subjects that engage in exercise on a regular basis (intensity of the activity x frequency x duration) - 45 subjects – 16.7%) c) *long term regular exercisers* - individuals that do regular exercise for a long period of time. The time period used was based on the Median (24 months) – 89 subjects – 33.1%.

Procedure:

This is a cross-sectional survey study in which participants were asked to complete a questionnaire.

Eligibility for participation was to be between 21 and 65 years of age, not having a diagnosed disease that limited exercise behavior and not doing sports at a professional level. Initially, we contacted the organizations to inform and obtain consent to conduct the study within the organizations. For this purpose, a letter explaining the study and asking for authorization was constructed, in some cases it was sent by mail/e-mail and in others, given directly to the responsible during a meeting. Once authorized, the contact with the eligible participants was done by email or directly. The participants had the choice to complete questionnaire a) or b):

a) Electronic package: designed using the Acrobat Professional software.

Participants filled online and submitted electronically to us. This package was sent as an attached file to an email with a brief research description and the instructions to fill and submit the instrument package.

b) In the paper version, there was a specific instruction on the last page concerning the submitting options. Participants could choose between delivering the instruments were they collected (an envelope was given for this purpose) or send by mail to the university (a prepaid mail envelope was also given).

In both cases, the front page had a brief explanation of the study and confidentiality of the data was assured. Of the 310 questionnaires returned, 6 were not fully completed and 35 participants didn't meet the inclusion criteria.

In the beginning of the data collection a pilot study (40 subjects) was conducted, to assess participants' reactions to the instruments length and translated versions of the regulatory efficacy, competing goals and CIS instruments. The pilot study allowed us to make some language form changes (see *measures* section) and also change some elements of the demographic and physical activity history forms.

Measures (Appendix A):

Socio-Demographic and Clinical Status. Includes 9 items about gender, age, marital status, education level, occupation, place of residence, medical problems, health and quality of life perception.

Alameda 7 (Schoenborn, 1985). Consists of 6 items measuring life habits on which people could answer "yes" or "no": physical exercise, smoking, sleeping 7 to 8 hours a day, drinking more than 2 alcoholic beverages, having breakfast every day and eating snacks between meals. Also, incorporates two items about length and body weight, that allow us to calculate Body Mass Index (BMI)[1].

[1] The equation for BMI is: weight in Kg/height in m^2

Physical activity history. Physical activity history was assessed by asking three questions, described next:

a) Asking participants if they were currently exercising, Exercise was defined as "walking briskly, bicycling, swimming or any other activities in which the exertion is at least as intense as these activities" (Marcus & Forsyth, 2003);

b) Exercise regularity: those who reported being physically active, were asked to mentioned their 2 most frequent exercise activities and the frequency (i.e. number of days per week they exercise), the duration (i.e. duration of each session of exercise) and period of time for which they had been exercising without stopping, for each activity mentioned.

The criteria used for *Regular Exercise* were derived from the American College of Sports Medicine and Center for Disease Control (CDC, 2005) recent recommendations for adults aged 18 to 65 years old (Haskell, W.L., Lee, I., Pate, R.R., Powell, K.E., Blair, S.N., Franklin, B.A., Macera, C.A., Heath, G.W., Thompson, P.D. & Bauman, A., 2007): "engage in moderate-intensity aerobics physical activity (brisk walking) on at least 5 days each week for a minimum of 30 minutes a day or vigorous-intensity aerobic physical activity (jogging) on at least 3 days each week for a minimum of 20 minutes each day or even a combination of both intensities". In addition, the recent guidelines also suggest the importance of adults performing activities that maintain or increase muscular strength as well as endurance, for a minimum of two days each week (Haskell et al., 2007).

c) Intention to change actual exercise behavior (Gebhardt & Maes, 1998): assessed by asking subjects how they felt about their current exercise levels. The participants could choose between "I would like to exercise more", "I would like to continue to exercise at the same level" and "I would like to exercise less".

Behavioral Regulation Questionnaire – 2 (BREQ-2). The BREQ-2 (Markland& Tobin, 2004) is an extension of the Behavioral Regulation Questionnaire (Mullan, Markland & Ingledew, 1997). It is a 19 items self-reported questionnaire that measures the continuum of the behavioral regulation suggested by Decy & Ryan (1985). Therefore contains five subscales: Amotivation - Lack of intention to engage in a behavior (4 items: e.g. "I don't see why I should exercise"), External Regulation – doing exercise in order to satisfy external pressures or to achieve externally imposed rewards (4 items: e.g. "exercise people other people say I should"), Introjected Regulation – internalization of external controls, used to avoid guilt (3 items : e.g. "I feel guilty when I don't exercise"), Identified regulation – acceptance of the importance of exercising in order to achieve personal valued outcomes (4 items: e.g. "It's important to me to exercise regularly") and Intrinsic Regulation – doing exercise for the enjoyment and satisfaction inherent in engaging in the behavior itself (4 items: e.g. "I exercise because it's fun"). Participants are asked to indicate, in a 5 point Likert scale, the extent, from "Not true to me" to "very true to me", to which each reason for exercising presented is true for them.

The BREQ-2 was used as a unidimensional index of the degree of self-determination – RAI (Relative Autonomy Index)[2].

The BREQ and BREQ-2 have been extensively used and validated in research (Mullan et al. 1997; Mullan & Markland, 1997; Wilson, Rodgers & Fraser, 2002; Wilson & Rodgers, 2003; Markland & Tobin, 2004). In the present research we used the Portuguese Version from Palmeira, Teixeira, Silva and Markland (2007). Subscale reliabilities ranged from .64 to .81. The pilot study conducted resulted in language changes on instructions and two items. The correlations between factors structure reveal a simple-like pattern (consistent with previous research), in which forms of behavioral regulation that are closer in the behavior regulation continuum, displayed a greater positive correlation than those further apart on the continuum (Mullan & Markland, 1997; Palmeira et al., 2007). For this study, total scale reliability was α = 689.

Regulatory Self-Efficacy Scale. Is a 20 item self-reported instrument in which respondents are asked to rate in a 5-point Lickert scale their confidence (from "Not confident at all" to "Extremely confident") in the ability to be regularly physically activity if facing any of obstacles presented (e.g. "If I am busy"). This instrument is an extension of a previous barriers efficacy questionnaire adapted to Portuguese (Marques & Gouveia, 2006), that incorporated barriers from the most used instruments in this research area the McAuley and Mihalko (1998) and Marcus e colleagues questionnaires (Marcus, Selby, Niaura & Rossi, 1992). This instrument demonstrated an excellent model fit for one-factor structure (CFI=.98; RMSEA=.00.p=.91; X^2/df=.998) and α=0.80. For the present research we added 12 barriers to the Portuguese previous version, for two main reasons. First, in the

[2] For a detailed explanation on the BREQ-2 score methods, *visit* http://www.bangor.ac.uk/~pes004/exercise_motivation/breq/breq.htm

previous study (Marques & Gouveia, 2006) several barriers were mentioned in the physical history form that we believed to be important to add, such as "economy difficulties", "lack of social support" and "other commitments". Also, some of the barriers that were eliminated from the previous questionnaire for not being statistically adequate, such as "being on holidays" were reintegrated, because we feel that the sample characteristics could have contributed to those items weak results. Moreover, we add 3 items from the Bandura's Efficacy Scale (Bandura, 2006) and 2 items from the Benisovich measure (Benisovich, 1998, *In* CPRC, 2008). The second reason to add more barriers to the previous version of this instrument, was because we think that, to effectively assess the confidence that individuals belief to possess to do exercise if facing difficulties, it is important to have a wide range of barriers, and there have been several barriers considered important in previous research with the Portuguese population and also in the international literature. For present study, the internal consistence of the whole scale was good α=.89.

Competing Goals Scale. The Competing Goals Scale is a 16 items self-reported instrument (Gebhardt & Maes, 1998) that assesses the interference of exercising regularly with other personal goals/activities that subjects may pursue, such as "watching TV", "studying" and "going shopping". For the goals that individuals consider to be affected by the time spending exercising regularly, they are asked to rate on a 5-point Lickert scale, how much that would disturb them if a particular personal goal/activity could not be attained ("It would bother me…" : from "Not at all" to "Greatly"). The score is obtained from the number of activities that are affected by exercising at a regular basis and at the same time a subjective value (of at least "bother somewhat") attached to that specific activity. Also, the scale incorporates 3 blank activities to be filled by subjects. In the author's original study, "Looking out after my family" and "my work", emerged as new competing activities. In the present version of this scale, activities such as "(time to) resting" and "being with my family" were added by a few subjects.

For this study, when translating the questionnaire to Portuguese language we did some changes in two original items. The activity "studying" was changed for "studying/working"; and for the activity "listening to the radio", *music* was added.

Checklist of Individual Strength (CIS). The CIS is a 20 item self-report questionnaire (Vercoulen, Swanink, Fennis, Galama, Van der Meer & Bleijenberg, 1994), that assesses four dimensions of fatigue: subjective feeling of fatigue (e.g. "I feel weak" – 8 items), reduced concentration (e.g. "I have trouble concentrating" – 5 items), reduced motivation (e.g. "I feel no desire to do anything" – 4 items) and reduced activity (e.g. "I have a low output" – 3 items). Respondents indicate, on a seven-point Likert scale ranging from "Yes, that is true" to "No, that is not true", the extent to which each statement applies to them in the past two weeks. The scores can be calculated by adding the results from the items of each scale. Furthermore, a CIS total score can be calculated by adding the four dimensions (ranging from 20 to 140). Higher scores indicate a higher degree of fatigue, concentration difficulties, reduced motivation and less daily activity. The CIS is well validated instrument within clinical settings with patients with Chronic Fatigue Syndrome and comparison with other chronic illnesses (e.g. Vercoulen, Hommes, Swanink, Jongen, Fennis, Galama, Van der Meer & Bleijenberg, 1996) and in organizational settings (Beurskens, Bultmann, Kant, Vercoulen, Bleijenberg & Swaen, 2000; Bultmann, Beurskens, de Vries, Bleijenberg, Vercoulen & Kant, 2000). The psychometric properties of the CIS are good (α=. 83 - α= .92). The Portuguese Version of the CIS is currently under study by Marques, Maes and DeGucht. In the present study, the Cronbrach's alpha for the global scale was α=.90, α=.89 for the subjective feeling of fatigue scale, α=.82 for the concentration scale and α=.78 for the activity scale. For the motivation scale, internal consistence was low α=.48.

Brief Symptom Inventory (BSI). The BSI (Derogatis, 1993; *In* Canavarro, 1999) is a self-reported measure that intends to assess psychological symptoms in adolescents and adults. It is a short version of the Symptom Checklist Revisited (SCL-R 90, Derogatis, 1975; *In* Canavarro, 1999) and consists of 53 items covering nine symptom dimensions: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, Positive Symptom Distress Index and Psychoticism. This instrument presents good psychometric characteristics, with internal consistencies varying from α=.71 – Psychoticims to α=.85 – Depression, and correlations between the BSI and SCL-90 ranging from r=.31 to r=.72 (Degoratis, 1993; *In* Canavarro, 1999). The Portuguese Version of the BSI (Canavarro, 1999) also presents satisfactory reliability values and good discriminant validity in differentiating between perturbed individuals and general population (Canavarro, 1999).

In the present study we used only the dimensions that have been associated with exercise behavior (Biddle & Mutrie, 2001): somatization (seven items – e.g. "faintness or dizziness"), anxiety (six items – "suddenly scared for no reason") and depression (six items – "feeling no interest in things") scales of the BSI, as well as the sleeping problems scale of the SCL-90 (three items – "trouble falling asleep"), which makes a total of twenty-two items. Individuals are asked to rank each symptom item on a 5-point Lickert scale, ranging from "Never" to "Very frequently", according to the degree in which each problem has bothered the subject in the past week. The internal consistency of the scales used in the present research, were very satisfactory: Somatization – $\alpha = .74$; Anxiety – $\alpha = .83$; Depression – $\alpha = .89$; Sleeping problems – $\alpha = .76$.

Data Analyses:

Statistical analyses were conducted using the SPSS 16.0 software. The scales to be used for the analyses were first screened by applying descriptive statistics (e.g. frequencies) and screened for normality. None of the scales violated the assumption of normality. In order to investigate the various research questions, several statistical procedures were applied. To answer research questions (1), (4) and (5), *One-way Anovas* and *Post-Hoc Multiple Comparison Tests* (*Tuckey*) were conducted. For question (2), a *Stepwise Discriminant Analysis* was computed. Finally, to answer question (3) we conducted *Pearson Correlation* Analyses.

Results:

Sample Characteristics and Physical Exercise:

Of the 269 participants, 96 (35.7%) were found to be non exercisers. The main reasons for not exercising reported were lack of time (66.7%), lack of discipline (15.5%) and scheduling incompatibility (8.3%). Of the 173 subjects (64, 3%) that reported to engage in exercise, 30.1% pointed as the main reason for exercising, physical and psychological well being (30,1%), personal satisfaction (19.9%), health (17.8%) and maintain/improve physical condition (17,1%).

Concerning exercise levels intentions, 72.8% reported intention to exercise more and 27,2%, to maintain their current level of exercising. Any of the participants chose the "doing less exercise" option. There were significant differences in the exercise intentions between subjects that exercise at different levels $X^2(3)$, *N=265*) = 44366, *p*=.000. 46.6 % of those who intended to exercise more were non exercisers, while 59.7% of those who intended to maintain the same level of exercise were long term regular exercisers. Only 6.9 % of the non exercisers intended to maintain the same level of exercise (5 subjects).

One hundred and sixty-four subjects reported interruptions in their regular exercise behavior, for a period of 3 months or more. The main reasons for this interruption were lack of time (21.9%), schedule conflicting (17.1%) and work excess (15.8%).

Concerning exercise activities, 97 subjects reported to do two activities. On the first option, the most frequent activities mentioned were gym activities (class activities) – 19.2%, followed by cardio-fitness training (e.g. stationary bicycle, step machine, etc) – 15,1%, and swimming (10.5%). The frequency of these activities ranged from 1 to 7 days a week (*M*=2.74; *SD*=1.512) and the duration of the exercise sessions, from 10 to 240 min (*M*=72.88; *SD*=78,02). The period of time without interruptions ranged from 1 week to 540 months (*M*=51, 75; *SD*=78, 02). For the activities named secondly, the most frequent were cardio-fitness (15, 5%), followed by strength training (11, 3%), brisk walking (13, 4%) and cycling (12, 4%). The frequency average was 2.24 days a week (*min.*=1; *max.*=7) and the duration of each session lasted for 74,32 min (*min.*=30; *max*=420). The period of time without stopping was 51, 54 months (*min.*=1 week; *max.*=504 months).

There were significant findings in regard to age, gender and level of education and the different levels of exercise. Those who did regular exercise for more than 24 months were significantly older (M=38.02) than those in the other three groups, F (3,258) =6.225; p=.000. In these groups the age mean ranged from 30.88 to 31.93. There were also significant differences between the different groups of exercise levels in terms of gender, $X^2(1, N=269) = 13.927$, p=.003. 43.6% of the women in the study were non exercisers while 40.4% of the men were long term regular exercisers. Concerning the education level, participants in the regular exercise groups had a higher education level then non exercisers (U=1358.50; W=5823.50; p=.001).

Regular Exercisers and long-term regular exercisers, had a healthier perception ($F_{(3,263)}$ =8.620; p=.000; η^2_p =.094) and higher quality of life perception ($F_{(3,262)}$ =10.232; p=.000; η^2_p =.121) when compared to non exercisers and irregular exercisers.

In relation to other health behaviors, 91.4% of the participants reported to have breakfast daily, 51.9 % have snacks between meals, 58.6% sleep at least 7-8 hr in every 24 hr, and only 2.2% have at least two beverages of alcohol a day. 27.8% smoke and within this group, the average of daily cigarettes was 10.62 (*min*= 1 and *max*=40) and period of time ranged from 6 months to 648 months (*M*=129.35). Participants height ranged from 1.46 to 1.93 meters (*M*=1.68) and subjects weight, from 44 to 107 kilograms (M= 65.36). Based on these two parameters we calculated the *Body Mass Index* (BMI). The average BMI was 23.14 (SD=3.33), which is considered to be normal weight. No significant differences were found for any of the *Alameda* 7 items, between all (non-)exercisers groups.

Exercise Motivation, Regulatory Self-Efficacy, Competing Goals and Physical Exercise:

To answer the first research question (1) *"Does exercise motivation (controlled-autonomous regulation), regulatory self-efficacy and competing goals valued by the individuals, differ between groups of (non-)exercisers?*, we conducted Univariate Anovas as well as Post-Hoc Multiple Comparison Tests (Tukey). This allow us to analyze not only if there were differences on regulatory self-efficacy, exercise motivation and competing goals between (non-)exercise groups, but also between each groups these differences were statistically significant (*Table 1).*

Table 1- *Means, Standard Deviations, ANOVAS and Multiple Comparison Tests on Behavior Regulation, Regulatory Self-Efficacy and Competing Goals:*

	Exercise Groups				F	$\eta^2 p$	Tuckey's HSD
	NE (N=97)	**IE** (N=38)	**RE1** (N=45)	**RE2** (N=89)			
Regulatory self-efficacy (Min=1.05;Max=4.65)	2.51 (0.52)	2.78 (0.53)	2.98 (0.58)	3.26 (0.54)	29.851**	.252	NE<RE1**, RE2** IE< RE2** RE1< RE2*
Behavior Regulation (Min=4; Max=18)	8.54 (4.29)	11.49 (4.20)	12.99 (3.56)	13.76 (2.94)	32.096**	.241	NE< IR**, RE1** RE2** IE< RE2*
Competing Goals (Min=21;Max=65)	2.76 (2.53)	1.56 (1.93)	1.26 (1.70)	1.22 (1.66)	9.607**	.104	NE> IR*, RE1**, RE2**
Psychological Symptoms (Min=1;Max=3.55)	1.75 (0.55)	1.58 (0.39)	1.49 (0.44)	1.59 (0.53)	4.883**	.055	NE>RE1*, RE2**
Anxiety	1.81 (0.65)	1.62 (0.48)	1.50 (0.48)	1.57 (0.69)	3.539*	.039	NE>RE1*, RE2*
Depression	1.78 (0.78)	1.48 (0.54)	1.51 (0.59)	1.52 (0.71)	3.100*	.031	n.s.
Somatization	1.49 (0.57)	1.35 (0.42)	1.26 (0.34)	1.24 (0.32)	5.490**	.060	NE>RE1*, RE2**
Sleep	2.21 (1.01)	2.20 (0.88)	1.90 (0.86)	1.85 (0.84)	3.124*	.039	NE>RE2**
Individual Strength (Min=21;Max=112)	74.42 (20.56)	67.81 (19.78)	58.61 (17.01)	53.79 (19.00)	18,795**	.185	NE>RE1**, RE2** IE>RE2**
Fatigue	36.78 (9.96)	32.21 (11.31)	27.36 (9.05)	22.69 (9.80)	32.462**	.281	NE>RE1**, RE2** IE>RE2**
Concentration	17.54 (7.74)	17.41 (7.36)	14.36 (5.80)	14.53 (6.14)	4.928**	.054	NE>RE2**
Motivation	11.87 (4.31)	10.81 (3.67)	9.57 (3.27)	9.86 (4.01)	5.677**	.064	NE>RE1**, RE2**
Daily Activity	20.39 (5.78)	19.74 (4.46)	18.82 (4.79)	18.78 (4.73)	1.660	.020	n.s.

Notes: Standard Deviation are in parenthesis.
NE: Non Exercisers; IE: Irregular Exercisers; RE1: Regular Exercisers; RE2: Regular Exercisers > 24 months.
*p≤0.05; **p≤0.01.

Exercise motivation (behavior regulation scale) differed significantly between the (non-)exercise groups ($F_{(3,257)}$ =32,096; p=.000; η^2p=.241). The sedentary subjects present the lowest score on the behavior regulation scale, in comparison to all the exercise groups. Also, those who exercise irregularly present significantly less autonomy on exercise regulation than regular long term exercisers.

Regulatory self-efficacy scores were significantly different between several levels of exercise behavior ($F_{(3,265)}$ =29,851; p=.000; η^2p =.252), with sedentary subjects presenting the lowest score. Moreover, there were significant differences between the two groups of regular exercisers (< 24 months and => 24 months) in the regulatory self-efficacy levels.

Finally, the number of highly valued competing goals were significantly higher within the non exercisers when compared with all the other groups of subjects ($F_{(3,239)}$ =9,607; p=.000; η^2p= .104). The most common valued competing activity with exercise was studying or working (34.9%), followed by spending time in other hobbies (22.3%), being at home and doing household (16%, respectively). Listening to the radio or music was only mentioned as being a valued competing activity for 2.6% of the participants. Although watching TV was considered a frequent conflicting activity with exercise (14,9%), only 2.2% consider that giving up watching TV to be able to exercise as being bothersome to them (Appendix B).

To answer research question (2) *"To what extent can exercise motivation, regulatory self-efficacy and competing goals adequately distinguish between groups of (non-)exercisers?"* we conducted a Stepwise Discriminant analysis, using Wilk's **Λ** method. Homogeneity tests, using the *Box-M* statistic, revealed significant differences on the variance-covariance matrix of the contrasting groups (M=39.77; F(18,69633)=2.14, p=.003). Nevertheless, the large sample size (N=236) and the difference between variances algorithms (<4:1) led to consider discriminant analysis adequate to permit the violation of the assumption of homogeneity.

The stepwise discriminant analyses extracted three significant functions which discriminated between the (non-)exercisers groups *(Table 2).* All the three variables considered (exercise motivation, regulatory self-efficacy and competing goals) were significant in maximizing the differences between the groups of (non-) exercisers. Function 1 is defined by the exercise motivation and regulatory self-efficacy, explaining 96.7% of the variability between groups. Competing goals present a negative coefficient in this function, showing the inverse relation to the other two variables. This function discriminates significantly the 4 groups (Λ=0.624; $X^2(9)$=109.100; p=.000), with group centroids correlations ranging from -0.948 for the non exercisers to 0.813 for the regular long term exercisers. The discriminant function led to a correct classification of 57.6% of the subjects in the groups. Functions 2 (Λ=0.981; $X^2(4)$=4.408; p=.354) and 3 (Λ=1.000; $X^2(1)$=0.042; p=.837), weren't significant in discriminating the groups considered in the analysis groups.

Table 2- *Standardized coefficients of the discriminant variables, explained percentage of variability between groups explained by the discriminant functions extracted and eigenvalues.*

Variables	**Discriminant Functions**		
	1	**2**	**3**
Exercise Motivation	**.535**	-.570	.732
Regulatory Self-Efficacy	**.556**	.868	-.288
Competing Goals	-.409	.534	.741
Eigenvalue	**.572**	.019	.000
Variância Explicada	**96.7%**	3.2	0.0

Exercise Motivation, Regulatory Self-Efficacy and Competing Goals:

To answer research question (3) "*Are exercise motivation, regulatory self-efficacy and competing goals associated*"? Pearson correlation coefficients were used, for the total sample and for each exercise level. In the first case, we found significant associations between all three variables, positive and moderate between regulatory self-efficacy and the exercise motivation (r=.510, p<.01) and negative and weaker association between the competing goals variable and both regulatory self-efficacy (r=-.173, p<.01) and exercise motivation (r=-.179, p<.01). For each exercise group the associations followed a similar pattern, for the association between regulatory self-efficacy and exercise motivation, that ranged from r=.365 (Irregular Exercisers) to .420 (Long Term Regular Exercisers). The correlations between the competing goals and the other variables (negative for all groups) weren't statistical significant for any of the (non-)exercise groups.

Individual Strength and Physical Exercise:

For research question (4) "*Do people in different groups of (non-)exercise have different levels of fatigue, concentration, motivation and daily activity?* we conducted Univariate ANOVA analysis as well as Post-Hoc Multiple Comparison Tests (Table 1).

Individuals not exercising or exercising at different levels also had different levels of Individual Strength, assessed by the CIS instrument. Significant differences were found between non exercisers and regular exercises in relation to the levels of individual strength ($F_{(3,261)}$ =18.795; p=.006; η^2_p= .185) with regular exercisers feeling less fatigue, less concentration problems and more motivation. No significant differences were found for activity between groups of (non-exercisers).

Psychological Symptoms and Physical Exercise:

To answer research question (5) "*Does depression, anxiety, somatic symptoms and sleeping problems, differ between groups of (non-)exercisers?*" we also conducted Univariate ANOVA analysis as well as Post-Hoc Multiple Comparison Tests (Table 1).

Regarding psychological symptoms, significant differences between groups were found for the global scale ($F_{(3,262)}$ =10.232; p=.000; η^2_p =.072) and three of the four subscales assessed (anxiety, somatization and sleeping problems). In all of the dimensions the regular exercise group presented lower levels of psychological symptoms in comparison to the non exercisers.

Discussion:

Hypothesis and Results:

The aim of the present research was to examine the relation between physical exercise and psychological variables that, from a self-regulation perspective, are considered to influence exercise adherence and maintenance, namely exercise motivation (Mullan et al.,1997), regulatory self-efficacy (Bandura, 1997) and competing goals with exercise (Gebhardt & Maes, 1998).

The reported levels of exercise allowed us to form several groups characterized by different levels of activity: non exercisers, irregular exercisers, short term regular exercisers and long term regular exercisers. The reason to form two regular exercise groups was based on the assumption of the exercise behavior research that exercise adoption and maintenance have different psychological factors involved (Maes & Karoly, 2005; Rothman, 2004; Weinberg & Gould, 2007).

Firstly, this research analyzed possible differences in exercise motivation, regulatory self-efficacy and competing goals, between the (non-)exercise groups previously formed.

Exercise motivation, considered by the literature as an important determinant of exercise adherence (Ryan & Deci, 2007), was assessed as a continuum from amotivation/external regulation to intrinsic motivation/internal regulation. Significant differences between subjects at different levels of exercise were found. As in previous studies, those who have been doing exercise in a regular basis for a long time present a higher degree of autonomy and intrinsic motivation than non exercisers and irregular exercisers (Mullan et al., 1997; Lutz, Karoly & Okun, 2008; Markland, 1999; D'Angelo, Reid & Pelletier, 2007). This leads to the assumption that the more autonomous the reasons to exercise, the more likely will be the maintenance of physical exercise.

Regulatory self-efficacy also presents significant differences between subjects at different levels of physical exercise, as previous research has demonstrated (Marshall & Biddle, 2001; Marquez & McAuley, 2006). Individual's confidence in their ability to exercise when facing several obstacles seems to significantly higher among the regular exercisers and it is also higher in those that have been exercising at a regular basis for a long period of time. Although some researchers have found self-efficacy to be more importance in the intention-decision phases than in maintenance (D'Angelo et al., 2007), one should notice that there have been different types of efficacy studied and that this appointment can be more appropriated for the task efficacy then regulatory self-efficacy. Since regulatory self-efficacy is the confidence to overcome barriers, it is easily understood that those who keep exercising without relapsing are probably those who trained skills to overcome obstacles (e.g. injury). On the other hand, regulatory self-efficacy doesn't seem to have the same impact between the non exercisers and irregular exercisers, although there is an increasing trend. This can be explained by the fact that the non exercisers haven't yet experienced most of the barriers so they might feel more confident that they would be able to overcome them.

Both regulatory self-efficacy and exercise motivation seem to be important variables in discriminating between individuals at different exercise levels. Nevertheless, it is important to notice that only 57.6% of the individuals were classified correctly by the discriminant functions, i.e., exercise motivation and regulatory self-efficacy can predict group membership for only half of the participants.

Competing goals with exercise, valued by individuals, are considered to be an important obstacle to health behaviors adoption, as it is the case of exercise behavior. According to the literature review, the existence of non health related goals that are in conflict with exercise behavior and that are valued, may contribute to the non-adherence to exercise (Geabhardt, 2006). In the present study, the most common competing goals with exercise were "studying/working", spending time in other hobby, being at home and doing household. The fact that in our study the competing activity studying/working was the most frequent and valorized may be due to (a) a large percentage of students in our sample and (b) the addition of "working" to the item, which may have contributed to a larger rate of respondents. As expected, in relation to the different levels of exercise, non exercisers reported to have significantly more competing goals that they valued, than all the other three groups of exercisers (Gehbardt & Maes, 1998).

In the present study we also intended to study the relation between the three study variables, especially between *regulatory self-efficacy* and *exercise motivation,* as recent research has been placing a great deal on the autonomy/competence relation and their importance for behavior change (Deci & Ryan, 2007). In this study, positive and moderate associations between individual's confidence to overcome exercise barriers and autonomy on exercise regulation, were found.

Individual strength and psychological symptoms were different between non exercisers and regular exercisers. As in previous studies (Weinberg & Gould, 2001; DeLuca, 2005), in the present research, those who exercise on a regular basis, experience less psychological and fatigue (mental and physical) symptoms Moreover, quality of life and health were perceived as being higher by exercisers when compared with non exercisers and in the health perception case, irregular exercisers. These results stress out the important physical and psychological benefits of exercising regularly.

Limitations and Recommendations:

While the findings of the present research are noteworthy, there are several limitations.

The cross-sectional design of this study limits the conclusions that can be drawn from these findings.

The data collection method by email can present selection bias, since only those that are familiar with this technology can use this method, which may contribute to a high percentage of higher level of education subjects. Also, it present an ethical limitation, due to the fact that the email address of the respondent is recognized and therefore we can't assure anonymity.

For the present research, exercise behavior was established by self-report measures, which is not as accurate as objective measures (e.g. step count test). Nevertheless, self-reported measures or combined measures are the best method to access a large number of subjects, especially when data is collected by indirect methods.

Future research should focus on longitudinal studies and intervention studies allowing us to understand if exercise motivation, regulatory self-efficacy and competing goals are significant determinants of exercise behavior change (adoption, maintenance, relapse and readopting).

Furthermore, possible interaction between variables, specially exercise motivation and competence should be studied in more detailed (e.g. exercise mediators), as it may have important implication on intervention strategies.

We also suggest physical exercise to be considered as a continuous variable (type of exercise x frequency x duration) instead of using groups based on exercise levels. Although groups' classification is based on scientific criteria, it is somewhat subjective, for example on the differences between regular exercisers at short, medium and long term. Also, it allows making more accurate statistical analyses.

Finally, it would be important to conduct replications of this study in other populations groups (e.g. age) and health behaviors (e.g. diet).

Practical Implications:

These finding, by adding knowledge on the psychological variables that may influence exercise behavior change, can contribute to physical exercise promotion. It seems to be important to design interventions that focus on strategies to increase skills and personal competence to overcome exercise barriers, increase intrinsic motivation and autonomous exercise regulation, and diminish the conflict of other goals with exercise.

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APPENDIX A:

Irá encontrar algumas perguntas sobre aspectos gerais da sua vida. Não existem respostas certas ou erradas – todas as respostas são válidas. Pedimos-lhe que responda com o máximo de sinceridade e que responda a todas as questões.

1- Sexo: Masculino ☐ Feminino ☐ **2- Idade:**______ **3 - Concelho onde reside:** ________________

4 - Estado Civil: Casado(a)/União de facto ☐ Solteiro(a) ☐ Divorciado(a)/separado(a) ☐ Viúvo(a) ☐

5 - Com quem vive: (assinale todos os que se aplicam): Só ☐ Com os Pais ☐ Com Amigos ☐ Com os Filhos ☐ Com Esposa(o)/Companheiro(a) ☐ Com outros Familiares ☐

6- Nº de Filhos: ______**7- Idades:** ____

7- Situação Profissional: Estudante ☐ Reformado(a) ☐ Doméstico (a) ☐ Activo(a) ☐ Nº de horas de trabalho semanal _____) Desempregado(a) ☐

8- Habilitações Literárias: ____

9- Como classificaria a sua saúde em geral durante a última semana?										
Péssima					Neutra					Óptima
0	1	2	3	4	5	6	7	8	9	10

10- Como classificaria a sua qualidade de vida global durante a última semana?										
Péssima					Neutra					Óptima
0	1	2	3	4	5	6	7	8	9	10

11-Sofre de alguma doença com diagnóstico médico?

Não ☐ Sim ☐ (Quais? ____)

12-Tem outras queixas de saúde?

Não ☐ Sim ☐ (Quais? ____)

13-Toma o pequeno-almoço diariamente? Não ☐ Sim ☐

14-Entre as refeições toma snacks (salgados ou doces)? Não ☐ Sim ☐

15-Fuma? Não ☐ Sim ☐ (Nº de Cigarros: ______ Há quanto tempo? __________)

16-Quanto pesa? ________________

17-Quanto mede? ________________

18-Dorme 7 a 8 horas por cada 24 horas? Não ☐ Sim ☐

19-Bebe mais do que duas bebidas alcoólicas por dia? Não ☐ Sim ☐

20-Faz Exercício Físico? (*Exercício Físico, inclui actividades como marcha, andar de bicicleta, nadar, actividades de ginásio, jogar futebol ou qualquer outra actividade que exija um nível de esforço, pelo menos idêntico, ao destas actividades).*

Não ☐ Porque motivos: ______________________________

Se actualmente <u>não</u> pratica exercício físico, avance para a <u>questão 22.</u>

Sim ☐ Porque motivos: ______________________________

Se actualmente <u>pratica</u> exercício físico, considere <u>uma semana do último mês</u> que melhor represente os seus níveis actuais de exercício físico e preencha o seguinte quadro:

Actividades Praticadas (exemplo: Natação):	Dias por Semana:	Duração por dia:	Há quanto tempo pratica esta actividade sem interrupções:
1 -			
2-			
3-			

22- Como se sente em relação ao seu nível actual de prática de actividade física?

Eu gostava de: fazer mais ☐ manter o mesmo nível ☐ fazer menos ☐

BEHAVIOR REGULATION FOR EXERCISE QUESTIONNAIRE – 2 (BREQ-2):

truções: Estamos interessados nas razões envolvidas na decisão de fazer ou não fazer exercício físico. Usando a escala necida, de 1 (Não é verdade para mim) a 5 (Muito verdadeiro para mim), por favor indique (assinale com uma cruz o pectivo quadrado) até que ponto é que cada uma das razões apresentadas é verdadeira para si. Relembramos que não respostas certas ou erradas, nem perguntas traiçoeiras, queremos apenas saber o que sente em relação à prática de ercício físico.

	Não é verdade para mim		**Algumas vezes é verdade para mim**		**Muito verdadeiro para mim**
	1	**2**	**3**	**4**	**5**
1. Faço exercício porque outras pessoas dizem que devo fazer.					
2. Sinto-me culpado(a) quando não faço exercício.					
3. Dou valor aos benefícios/vantagens do exercício.					
4. Faço exercício porque é divertido.					
5. Não vejo porque é que tenho que fazer exercício.					
6. Faço exercício porque os meus amigos/família dizem que devo fazer.					
7. Sinto-me envergonhado(a) quando falto a uma sessão de exercício.					
8. É importante para mim fazer exercício regularmente.					
9. Não percebo porque é que tenho que fazer exercício.					
10.Gosto das minhas sessões de exercício.					
11. Faço exercício porque os outros vão ficar insatisfeitos comigo se não fizer.					
12. Não percebo o objectivo de fazer exercício.					
13. Sinto-me fracassado(a) quando não faço exercício durante algum tempo.					
14. Penso que é importante fazer um esforço para fazer exercício regularmente.					
15. Acho o exercício uma actividade agradável.					
16. Sinto-me pressionado(a) pela minha família e amigos para fazer exercício.					
17. Sinto-me agitado(a) nervoso(a) se não fizer exercício regularmente.					
18. Retiro prazer e satisfação da minha prática de exercício.					
19. Penso que fazer exercício é uma perda de tempo.					

REGULATORY SELF- EFFICACY SCALE:

uções: Leia atentamente cada uma das seguintes questões. Usando a escala, de Nada Confiante a Extremamente fiante, coloque uma cruz no quadrado que melhor representa o seu grau de confiança de que conseguiria/continuaria a car exercício físico regularmente (pelo menos 3 dias por semana, num total diário mínimo de 30 minutos) em cada uma eguintes situações:

nsigo praticar exercício físico regularmente ...	Nada Confiante	Pouco Confiante	Moderadamente Confiante	Muito Confiante	Extremamente Confiante
Estiver mau tempo (exemplo: quente, chuvoso, frio)					
Sentir dor ou desconforto a praticar.					
Me sentir cansado(a).					
Tiver que fazer exercício sozinho(a).					
For difícil aceder ao equipamento ou instalações sportivas					
Estiver de "mau humor"					
O meu horário de trabalho/estudo dificultar a prática					
O instrutor/professor não me encorajar.					
Sentir que não tenho tempo.					
). Não for divertido ou agradável.					
. Não estiver com vontade.					
2. Estiver ocupado(a).					
3. Estiver de férias ou a viajar.					
4. Estiver preocupado(a) com questões financeiras.					
5. Depois de recuperar de uma lesão ou doença que ne fez parar.					
6. Ao praticar, tomar consciência da minha aparência ísica					
7. Estiver sob stresse.					
8. Não tiver apoio (suporte social).					
9. Tiver outros compromissos.					
20. Durante ou após ter tido problemas pessoais.					

COMPETING GOALS SCALE

nstruções: Leia atentamente cada uma das seguintes questões e escolha as opções que melhor descrevem a situação. Por favor responda a todas as questões.

fizesse ou continuasse a fazer rcício físico regularmente (pelo os 3 dias por semana, num total io mínimo de 30 minutos), teria de ar de :				**Não Incomoda**	**Incomoda Pouco**	**Incomoda Moderadamente**	**Incomoda Muito**	**Incomoda Muitíssimo**
Ir ao cinema ou teatro.	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
Ver televisão.	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
Ir às compras.	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
Jantar fora.	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
Sair para beber um copo.	NÃO	SIM	*Se S IM, até que ponto é que isso o incomoda?*					
Ler (jornal, revista, livro)	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
Ouvir rádio/música.	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
. Jogar jogos (de mesa).	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
. Viajar.	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
0. Fazer tarefas domésticas	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
1. Despender tempo noutros hobbies	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
2. Ir a um encontro.	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
3. Ter visitas.	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
.4. Fazer uma visita.	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
.5. Estar por casa.	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
~~16. Estudar/Trabalhar~~	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
17. Outros: ____________	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
18. Outros: ____________	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					
19. Outros:	NÃO	SIM	*Se SIM, até que ponto é que isso o incomoda?*					

CHECKLIST OF INDIVIDUAL STRENGHT (CIS-20)

Instruções: Nesta página encontrará 20 afirmações, através das quais pretendemos compreender a forma como se tem sentido nas últimas duas semanas. Para cada afirmação que se segue, coloque apenas uma cruz (X), no quadrado que melhor descreve a forma como se tem sentido nas últimas duas semanas. Não se esqueça de responder a todas as afirmações.

1. Sinto-me cansado(a).	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
2. Sinto-me muito activo(a)	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
3. Pensar requer esforço.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
4. Sinto-me fisicamente exausto(a).	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
5. Sinto vontade de fazer coisas agradáveis, que me façam sentir bem.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
6. Sinto-me em forma.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
7. Faço imensas coisas num dia.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
8. Consigo concentrar-me bastante bem enquanto estou a fazer uma tarefa.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
9. Sinto-me fraco(a).	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
10. Não consigo fazer muito durante o dia.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
11. Consigo concentrar-me bem.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
12. Sinto que descanso.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
13. Tenho dificuldades em concentrar-me.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
14. Sinto que estou em má condição física.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
15. Tenho muitos projectos.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
16. Canso-me muito rapidamente.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
17. Produzo pouco.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
18. Sinto-me sem vontade de fazer coisa alguma.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
19. Os meus pensamentos dispersam-se facilmente.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**
20. Sinto que estou em boa forma física.	**sim, é verdade**	☐	☐	☐	☐	☐	☐	☐	**não, não é verdade**

BRIEF SYMPTOM INVENTORY:

Instruções: A seguir encontra-se uma lista de problemas ou sintomas que por vezes as pessoas apresentam. nale, num dos espaços à direita de cada sintoma, aquele que melhor descreve o grau em que cada problema o modou durante a última semana. Para cada problema ou sintoma marque apenas um espaço com uma cruz. Não e nenhuma pergunta por responder.

Em que medida foi incomodado pelos seguintes sintomas (na última semana):	Nunca	Poucas Vezes	Algumas Vezes	Muitas Vezes	Muitíssimas Vezes
1.Nervosimo ou tensão anterior.					
2.Desmaios ou tonturas.					
3.Dores sobre o coração ou no peito.					
4.Acordar de manhã muito cedo sem conseguir voltar a adormecer.					
5.Pensamentos de acabar com a vida.					
6.Ter um medo súbito sem razão para isso.					
7.Sentir-se sozinho.					
8.Dificuldade em adormecer.					
9.Sentir-se triste.					
10.Não ter interesse por nada.					
11.Sentir-se atemorizado.					
12.Vontade de vomitar ou mal-estar do estômago.					
13.Sensação de que lhe falta o ar.					
14.Calafrios ou afrontamentos.					
15.Sensação de anestesia (encortiçamento ou formigueiro) no corpo.					
16. Sentir-se sem esperança para o futuro.					
17. Falta de forças em partes do corpo.					
18.Sentir-se em estado de tensão ou aflição.					
19. Ter ataques de terror ou pânico.					
20.Sentir-se tão desassossegado que não consegue manter-se quieto.					
21.Sentir que não tem valor.					
22.Sono inquieto ou perturbado.					

APPENDIX B:

Frequency of Reported competing activities with exercise behavior and those that are expected to be at least somewhat bothersome (valued activities):

Competing Activities	Frequency of Activities	Valued activities
Studying/Working	40.9% (110)	34.9% (94)
Being at home	39% (105)	16.4% (43)
Spending time on hobbies	37.5% (101)	22.3 % (60)
Doing the household	31.3% (84)	16.4% (44)
Going to a meeting	17.8% (48)	13.4% (36)
Making a trip	17.1% (44)	12.6% (34)
Having Visitors	15.2% (41)	8.6% (23)
Watching TV	14.9% (40)	2.2% (6)
Reading	13.8% (37)	8.2% (22)
Going on a visit	13% (35)	7.8% (21)
Going shopping	11.2% (30)	4.1% (11)
Going out for dinner	11.2% (30)	6.3% (17)
Going out for a drink	8.2% (22)	4.8% (13)
Playing a game	7.1% (19)	2.6 % (7)
Going to a movie/play	6.3% (17)	3% (8)
Listening to music	5.2% (14)	1.5% (4)

Note: Number of subjects are given between brackets.