

The Effect of Regular Physical Activity

in Relieving Stress and Improving

Overall Well-Being in Adults.

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Abstract

This study examines the effect of regular physical activity in relieving stress and improving overall well-being in adults. The study employed a correlational, quantitative, cross sectional design using within subjects. A questionnaire was administered in order to collect data in relation to participant's exercise regime, perceived stress, life satisfaction, happiness and general health. A total of 120 participants, who ranged in age and gender, took part in the study. The results of the research found that participants who reported taking part in regular physical activity displayed significantly lower levels of perceived stress and improved overall well-being than non-exercisers. The conclusion can also be drawn that social support, context control and general self-efficacy are important factors in the alleviation of perceived stress.

Introduction

In recent years, health psychologists have examined the role of regular physical activity in maintaining mental health and relieving stress among adults. Accumulating evidence supports the popular belief that regular physical activity is associated with both physical and psychological health. (Burton, N.W, Pakenham & Brown, 2010). Physical fitness has been found to have a number of physical health benefits including improving cardiovascular health (Vanhee et al, 2012), increasing longevity (Moore et al, 2012), reducing the risk of cancer (Ratnasinghe, 2010) and preventing both osteoporosis (Siegrist, 2008) and diabetes. (Gill & Cooper, 2008). Regular physical activity has also been linked to numerous psychological benefits. These include improvements in mood (Hansen, Stevens, & Coast, J. 2001), self-esteem and self-efficacy (Elavsky, 2010), life satisfaction and happiness (Netz, Wu, Becker, & Tenenbaum, 2005). and an overall feeling of well-being. (Folkins & Sime, 1981). As a result regular physical activity has been suggested as an effective treatment for the prevention and treatment of a range of mental health conditions (Faulkner & Biddle, 2001). Over the last number of years psychologists have accumulated a large amount of research which suggest a strong association between stressful life events and ill health. (Brown & Siegel, 1988). One notable advantage of regular exercise is its ability to alleviate the negative effects of stress. Experimental studies have shown that extremely fit individuals display less physiological reactivity to stress than those who are less fit. This was identified in a study by Holmes & Roth (1985), who exposed 10 high-fit and 10 low-fit women to a mildly stressful psychological task. Pulse rates and levels of subjective arousal were assessed and the findings revealed that the high-fit individuals displayed lower elevations in heart rate than those who were considered low-fit participants. The present study will focus mainly on the positive effects that regular exercise has in relieving perceived stress and improving overall well-being in adults.

It will also examine how this correlation may also be affected by several of the other factors involved in coping with stress including context control, social support and self-efficacy.

Biopsychosocial Model

Stress is a condition of psychological health which, when left untreated, can have a number of negative mental and physical effects on the body. In contrast, exercise is a physical activity that that can have positive effects on both mental and physical well-being. Therefore in order to examine the role of exercise in relieving stress, the relationship between the mind and body must first be considered. Historically many philosophers believed that the mind and body together determined health and illness. The biopsychosocial model was proposed by George L. Engel (1997) in response to this assumption. He developed the model in direct contrast with the then dominant biomedical model which assumed that all illness could be explained by focusing only on the physical processes such as the pathology, biochemistry and physiology of a disease. Engel (1997), observed a number of liabilities and shortcomings in relation to the biomedical model. It presumed a mind-body dualism implying that the mind and body are completely separate. It was also found to be a single-factor model because it only recognised illness in terms of biological issues and did not account for any other factors which may be involved. The model also strongly emphasised illness over health and did not take into consideration any conditions that could promote health. It reduced illness to low-level processes and was a reductionistic model. Most significantly, it was unable to account for why certain people develop illnesses when exposed to them, while other people do not. (Taylor, 2009). The biopsychosocial model attempted to alleviate the shortcomings of the biomedical model and to establish the relationship between the mind and body in determining health and illness.

The biopsychosocial model was based on the premise that biological factors; such as pathogens like germs and toxins, psychological factors; like self-control, self-esteem, self-efficacy, thoughts, emotions, support and behaviours and social factors; for example socioeconomic status, culture, poverty, technology, and religion, all influence the health and wellbeing of an individual. (Suls & Rothman, 2004). Through the application of a systems theory approach, both macrolevel processes (such as the presence of stress) and microlevel processes (such as cellular disorders or chemical imbalances) combine in order to achieve a case of health or illness. (Taylor 2009). The biopsychosocial model suggests that recommendations for treatment to illnesses (for example stress) must involve an interdisciplinary approach taking into account all three sets of factors. (Schwartz, 1982). Both the psychological and social factors, that contribute to an illness, must be assessed in order to treat and eliminate it completely. (Engel, 1980). These findings imply that if someone is stressed because they have low self-esteem due to poor body image it is important to treat both the stress and the low self-esteem in order to fully cure the individual. The biopsychosocial model also suggests that a poor health habit can be replaced with the development of a healthy one by understanding them in their social and psychological contexts and making the necessary changes. This indicates that if an individual who suffered from a lot of stress took up exercise in order to improve their general health, then the individual's level of stress would also be reduced. As a result the biopsychosocial model supports the hypothesis that regular physical activity would be effective in relieving perceived stress in adults.

Stress

As previously discussed there is a growing amount of evidence to support the assumption that stress plays a significant role in determining psychological and physical wellbeing. (Rueggeberg, Wrosch, & Miller, 2012).

Stress is a negative experience that can cause people to feel overwhelmed, worried or run-down which can lead to both physical (the body) and psychological (the mind) effects making it a very serious health problem. It can affect people of all ages, genders and circumstances. More specifically, stress is defined as any uncomfortable emotional experience accompanied by predictable biochemical, physiological, behavioural and cognitive changes that are either aimed toward adapting to the stressful situation or accommodating its effects. (Baum, 1990). Any stimulus, event or experience that provokes a stress response in an individual is known as a stressor. Stressors and indeed the resulting stress affects each person differently and can have implications for all aspects of the individual's life including psychological, physical and social factors. This reinforces the biopsychosocial's assumption that to treat any illness (including stress) the therapy applied must be unique to each particular individual and involve all three sets of factors.

Stress as a Stimulus

Research by Holmes and Rahe (1967), revealed a list of common causes of stress that most people would find stressful. These included specific life changes such as the death of a spouse and disturbing events within the environment such as a large mortgage. A high overall score on the scale indicted that the stress could have a negative impact on your health as a result. Elliott and Eisdorfer (1982) also focused on stimulus characteristics in regards to stress. They determined that stressors which provoke challenges to bodily homeostasis, such as an a surgery, elicited different stress responses than chronic stressors, for example job loss. However a significant weaknesses of the stress as a stimulus model is that it does not take into account the individual's personality or their perception of how difficult the stressor is to deal with.

Stress as Transaction

Another theory which attempts to take these limitations into account is the stress as a transaction model. Stress occurs as the consequence of the individual's appraisal processes and their perceived ability or inability to cope with the demands of their environment. This is known as the person-environment fit. (Taylor 2009). Both psychological and biological stress responses engage in the complex stress process which works to protect the individual's mental health as a whole. Psychological stress responses include changes in mood, control, performance and cognition. Biological stress responses include autonomic arousal, activation of the Hypothalamic-Pituitary Adrenal (HPA) axis, immune system response, and endocrine responses as well as other systemic responses, including brain systems. (Rice, 1999).

An additional theory which focuses on stress as a transactional model is Lazarus's View (1984). He believed the interpretation of the stressful event and the individual's perception of it was more important than the particular event. Humans are more vulnerable to stressors as a result of being about to think about and anticipate future events. This human perception involves assessing potential harms, threats and challenges as well as the individual's perceived ability to cope with them. The differences between individuals in coping strategies and in the appraisal of a stressful event determines how the person will experience stress. It is for this reason that stress and the effects of stress varies between people.

Stress as a Response

Walter Cannon (1932) proposed that an individual experiences a fight or flight response to stress. (Cannon, 1932, as cited in Taylor, 2009).

He believed when the body perceived stress the sympathetic nervous system and the endocrine system caused a physiological response allowing the individual to attack the threat of stress or flee. As a result of this assumption it can be assumed that a person could fight stress by taking active measures to improve their well-being through exercise or meditation or by dealing directly with the source of stress. Alternatively if the individual was seen to become withdrawn or turn to substance abuse to cope with the effects of stress this would be considered as the flight response.

The General Adaption syndrome was developed, as a carry on to the fight or flight response, by Hans Selye (1976). It processes the body's attempt to defend itself against noxious agents through the use of three stages. (Sarafino & Smith, 2012). The first stage is the alarm reaction. This stage sees the body's defences mobilized through the activation of the sympathetic nervous system preparing the individual for the fight or flight response. This causes adrenaline to be released as well as an increase in heart rate and respiration and an increase in blood pressure. Sweat glands are activated and the gastrointestinal system's activity decreases. (Brannon & Feist, 2010). The second stage is known as the resistance stage. During this stage the body begins to adapt to the stressor. Neurological and hormonal changes continue to happen if the stress is left untreated during this stage. Selye (1976), believed a continued resistance to stress would lead to severe consequences on the body in the form of diseases such as hypertension, cardiovascular disease, hyperthyroidism, bronchial asthma, peptic ulcers and ulcerative colitis. It is important to note here that regular exercise is proven to be a very successful aid in the prevention of the majority of the mentioned diseases. Selye (1976), further believed that stress caused damage to the immune system increasing the individual's chances of infection. The last stage of the general adaption syndrome is the exhaustion phase. This stage sees the body's ability to resist stress beaten and a breakdown occurs.

The parasympathetic division of the automatic nervous system is at a worryingly low level and the person becomes exhausted leading to depression and sometimes death. However one criticism of Selye's theory in terms of psychology is that it did not include the situational and psychological factors, as already described in Lazarus's view, that play a role in stress. It also incorrectly assumes that all stressors produce the same physiological reactions. Certain stressors elicit a stronger emotional response than others do and as a result can be more difficult for individuals to cope with.

Coping with Stress

As already discussed stress has a huge impact on the body and the mind. In addition to the serious health implications previously mentioned stress can also cause sleep disturbances, anxiety, agitated behaviour, restlessness, muscle tension, noncardiac chest pains, dizziness, panic attacks (hyperventilating), lack of energy and fatigue, difficulty concentrating, forgetfulness, negative thoughts, constant worrying, apathy, feeling unsociable, frustration, a feeling of helplessness, feeling overwhelmed and addiction (Goeders, 2003). Therefore it is crucial for individual's to develop ways to manage and cope with stress. Health and energy is mentioned as one very important coping resource (Lazarus & Folkman, 1984). Physically healthy energised people are better able to manage external and internal stressful demands. General health is very important when battling stress. Being ill can lead to causes for stress and can mean a person has less energy to fight back.

An individual's overall happiness can also have an effect on their reaction and ability to cope with stress. A study of happiness among 100 college students (72 females and 28 males), examined the relationship between perceived stress and happiness. (Schiffirin, & Nelson, 2010).

Participants who perceived higher levels of stress reported being less happy than those with lower levels of stress. These findings support the assumption that stress needs to be reduced in order to achieve happiness.

In recent years another factor which has been found to be of huge benefit in coping with stress is social support. (Cohen & Syme, 1985). Stressed individuals with an excellent support system manage their stress more successfully because their support encourage them to adopt healthier habits such as taking up exercise. People with good social support systems are often more confident as a result and this helps them to handle stressful situations better, for example a job interview. It can also help an individual who is suffering from stress to simply have someone to talk to about their problems and this is much more likely if they have social support in place. The stress buffering hypothesis suggests that social support alters the physiological responses to stress however studies have proved to be inconsistent in confirming this hypotheses. (Cohen and McKay, 1984).

Context control is another factor which affects an individual's ability to cope with stress. (Folkman, 1984). A strong sense of context control is achieved when a person is confident they have control over the events that shape and effect their lives. Kent (1975), tested Lazarus's belief that the less control an individual believes themselves to have in a threatening situation, the more stressful it will be. He used 66 male undergraduates under the conditions of nonstress, avoidable shock or unavoidable shock. It was found that the participants in the unavoidable shock group reported more anxiety but displayed less physiological stress than the avoidable shock group. Rotter's (1966) concept of the locus of control stated that people who believe they control their own lives have an internal locus of control and generally live healthier lives while those who believe that other forces such as luck, fate or the actions of others determine their lives display external locus of control and are more prone to suffering from stress.

Other coping strategies which have proven to be effective in relieving stress are high personal hardiness which buffers the effects of stress, problem focused coping which aims to solve the problem completely, emotion focused coping which attempts to manage distress associated with stress, meaning focused coping which helps people find underlying meaning in bad experiences and proactive coping which aims to prevent a future stressor . Some behavioural interventions which can be used to manage stress are relaxation training, cognitive behavioural therapy, meditation, adopting a healthy lifestyle, eating healthily and participating in regular exercise. (Edworthy, 2000).

Exercise

Exercise is any activity which requires physical effort that is carried out in order to improve health and well-being. There are five types of exercise. (Sarafino & Smith, 2012). They are isometric exercise (e.g. pushing a wall), isotonic exercise (e.g. weight lifting), isokinetic exercise (e.g. stationary exercise bike), anaerobic exercise (e.g. basketball) and aerobic exercise (e.g. jogging). As previously discussed, exercise has a number of positive physical and psychological effects for individuals. In order to achieve these advantages it is recommended that individuals participant in 30 minutes or more of moderate-intensity activity every day (e.g. going for a walk or jog) and 20 minutes or more of vigorous activity at least 3 days a week. (e.g. playing football). (Pate, 1995). One investigation which examined this claim was a repeated measures study of 21 college students between the age of 20-26 years of age. The profile of mood states inventory was administered before and after 1 quiet resting trial and 3 exercise trials of 10, 20 and 30 minutes on a bicycle ergometer. Participant's heart rate levels were controlled at 60% of their estimated VO₂ max level. The results suggested that exercising for 10 minutes was sufficient in increasing vigor, decreasing fatigue and decreasing total negative mood state. After 20 minutes of exercise confusion was also seen to improve.

The findings of the study confirmed recommendations for 30 minutes or more daily physical activity in order to attain improved physical fitness and the additional health benefits. (Hansen, 2001). These positive effects can be both short and long term. A study of 82 adult participants examined the short and long term psychological effects following the completion of a 12 week aerobic fitness program. Participants were then required to complete the Beck Depression Inventory, Profile of Mood States, State-Trait Anxiety Inventory, and the Tennessee Self-Concept Scale. Physiological measures including submaximal heart rate, predicted maximum oxygen uptake and resting heart rate were used to establish any changes in aerobic fitness. All participants were found to experience an improved state of fitness and psychological well-being after the 12 week program. After one year both physiological and psychological benefits remained significantly improved. (DiLorenzo et al., 1999). The results demonstrated that exercise has both short and long term effects on psychological well-being. The short and long term effects of exercise may be explained by the large number of hormones released during exercise. (Coz, 2007). Endorphins are released by the pituitary gland which cause the individual to feel exhilarated and happy and blocks out any feelings of pain or stress. Another hormone released during exercise is serotonin. Serotonin causes more energy and clearer thinking and is responsible for happiness, restful sleep and a healthy appetite which all contribute towards overall well-being.

Physical Exercise to Relieve Perceived Stress

A considerable amount of research has been carried out to examine the role of physical exercise as an intervention for stress. Studies examining this question have determined that people who exercise regularly often report less stress and show less reactivity to stressors in their lives than people who do not exercise at all. One early study which supported this claim was an empirical study by Roth and Holmes (1985).

A total number of 112 participants between the age of 17 and 31 who had reported life changes/stress during the previous 12 months had their fitness assessed with a submaximal bicycle ergometer test. After this was completed participant's physical health was monitored for a further 9 weeks. At the end of this period participant's were required to complete the Beck Depression Inventory, the State-Trait Anxiety Inventory and the Discomfort and Alienation scales from the Psychological Screening Inventory. Multiple regression analyses found that a high level of stress during the previous year was related to poor physical health for participants who displayed a low level of fitness. Life stress was found to have little to no impact on participants who exhibited high levels of fitness. Therefore in accordance with this hypothesis the results determined that fitness can moderate the relationship between stress and illness and that increasing fitness can be effective in the decreasing the effects of unavoidable stress. In accordance with this hypothesis, it can be suggested that individuals who are physically fit are less vulnerable to the adverse effects of life stress than those who are not fit. Additional studies have also linked good exercise habits to protection from stress. (Salmon, 2001). A longitudinal study of 364 female adolescents by Brown and Siegel (1988) found that those who exercised were better able to cope with stress than those who did not. The negative effects of stress on health were found to decline as exercise increased. A large longitudinal study, investigating the relationship between perceived stress and self-reported absenteeism in the workplace, of 79,070 participants determined that individuals who admitted being less active than the average were twice as likely to report high stress levels. (Jacobson, Aldana, Goetzel, Vardell, Adams, & Pietras, 1996). Another study carried out by Goldwater and Collis (1985) compared a moderate cardiovascular exercise program, for 51 men between the age of 19 and 30, against a vigorous cardiovascular program over a 6 week period. It found that the men in the vigorous program showed greater reduction in stress and anxiety and increases in overall psychological well-being.

These findings emphasise the positive effects of regular physical activity in buffering and relieving stress in individuals.

Exercise has also been found to eliminate the negative health effects of stress as a result of its beneficial impact on immune functioning. (Fiatarone, Morley, Bloom, Benton, Makinodan, & Solomon, 1988). Exercise moderates the increase in blood pressure that accompanies psychological stress. (Hamer, Taylor & Steptoe, 2006). Individuals who adhere to a regular physical exercise programme are found to demonstrate smaller increases in diastolic blood pressure than those who are less physically active. A cross sectional study found that aerobic exercise in addition to counselling was more effective in the treatment of depressive disorders than counselling alone. Exercise was found to release tension which as a result reduced stress. (Weyerer and Kupfer, 1994). As a result of the above findings exercise can therefore be said to decrease stress on a psychological and physiological level.

Rationale for the Study

This study aims to develop on the previous research described and further support the hypotheses that regular physical exercise relieves stress and improves overall well-being in adults. A meta analysis which examined 36 studies linking physical activity to well-being in older adults revealed a number of findings. (Netz., Wu, Becker, & Tenenbaum, 2005). Aerobic training was determined to be the most beneficial while moderate intense activity was assessed to be the most beneficial activity level. However in contrast to this, a study of 40 women, over an 8 week period, who were assigned to either a running (aerobic), weight lifting (nonaerobic) or wait-list control condition found that both exercise conditions significantly reduced depression compared with the control group. (Doyne, Ossip-Klein, Bowman, Osborn, McDougall-Wilson, & Neimeyer, 1987).

These findings suggest that it was not necessary to improve participants cardiovascular fitness in order to demonstrate significant reductions in depression. As a result of this observation this study will attempt to further examine the impact of cardiovascular training and muscular training to determine if there are any significant differences between the two types of exercise in reducing perceived stress and improving overall well-being. The relationship between the frequency of exercise and stress reduction will also be examined as this is another area which previous research has failed to assess.

Recent research into the effect of exercise in relieving stress and improving overall well-being in adults has identified a number of limitations which this study hopes to address. A large amount of the previous research focused exclusively on adolescents, college students, elderly adults or people within the workforce. Adolescents and college students tend to be in better health than older adults. (Brown, 1991). It is for this reason that research is needed to determine whether fitness moderates the effects of stress in older populations. As a result, this study will include a more broad range of participants by examining individual's over the age of 18. This study will also attempt to provide a relatively similar dispersion of both males and females because a lot of the previous research seemed to focus specifically on either males or females. This will allow for the proper assessment of any gender differences in the ability of exercise to relieve stress.

In addition to this, this study will also examine whether exercising as part of a team and social aspects involved helps to further reduce stress as opposed to for individuals who exercise alone. This is an aspect which previous research has not fully examined. The social aspect involved in participating in a team sport or exercising in the company of a companion could be responsible for improvement in the individual's mood and reducing any anxiety or stress they may be experiencing. Social support in this regard acts as a coping strategy (Ogden, 2007).

Participating as part of a team allows an individual to develop social support, social identity, social comparison and social status. However it will also be important to look at the how the performance principle associated with team sports and the pressure to perform well may actually produce more stress for an individual than it relieves. This will likely depend on the level of sport the individual is participating in. Individuals who exercise on their own benefit from having the time to think through any worries and problems they may be experiencing logically or alternatively it can give them a chance to forget these issues as they focus on the exercise they are doing. (Bahrke & Morgan, 1978). Whether exercising alone or as part of a team well-being has been found to be significantly higher than those who do not exercise at all. (Ensel & Lin,2004).

It has also been suggested that engaging in a regular exercise program may provoke a sense of accomplishment and enhanced self-efficacy. (Dooyne et al, 1987). Self efficacy has also been found to be important in supporting an individual to maintain their positive exercise behaviour. (Fletcher & Banasik, 2001). Self-efficacy allows the person to believe they can successfully perform such exercise and experience the health benefits as a result. The more enhanced the self-efficacy the more likely the individual will continue with their exercise and therefore it aids exercise in providing overall well-being. This study will examine the positive effects of a strong sense of self-efficacy in relieving stress and improving overall well-being to determine if such a relationship exists.

From the above discussion it can be established that main hypotheses of this study are that there will be a significant relationship between individuals who participate in regular exercise and lower levels of stress. Individuals who score highly on over-all well being, in relation to general health, happiness and life satisfaction, will be found to display lower levels of stress and high levels of exercise.

It is predicted that individuals who exercise regularly as part of a team will describe lower levels of stress and better overall well-being than individuals who exercise on their own because of the social aspect involved in team sports. It is proposed that the more regular an individual exercises the lower levels of stress they will display. It is also expected that there will be a significant difference between type of exercise (cardiovascular or muscular) and the reduction of stress. It is also hypothesised that context control, self efficacy, social support and a healthy BMI will show a positive correlation with overall well-being and low levels of stress.

Methodology

Participants:

The study consisted of 120 participants who completed the questionnaire. Participants were a convenience sample recruited online personally by the researcher through Facebook, an athletic club, football club, basketball club and a local community centre. Quota sampling was employed to ensure a relatively similar number of both male and female participants. As a result 48% of participants (58) were males and 52% (62) were females. The total number of participants (N=120) were divided into three groups, 31% of participants took part in a team sport (N=37), 46% of participants carried out exercise individually (N=55) and 23% reported participating in no exercise at all (N=28). The participants ranged in age from 18-67 years old. (Range=49/Mean=26.78/ Standard Deviation=9.184).

Design:

This study employed a correlational, quantitative, cross sectional design using within subjects. The predictor variables were exercise, method of exercise (team sport or exercising individually), type of exercise (cardiovascular, muscular or combination), body mass index, gender, self-efficacy, context control and support. The criterion variables were perceived stress, life satisfaction, general health and happiness.

Materials:

The materials used in this study included; a brief and a consent form, a short demographic questionnaire developed by the researcher, self generated psychological measures to test for support, context control, happiness and physical activity, The Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983), The Satisfaction with Life scale (slightly altered) (Diener, Emmons, Larsen, & Griffin, 1985), The General Health

Questionnaire (Goldberg, 1978) and The Generalised Self-Efficacy Scale (Schwarzer & Jerusalem, 1995).

The brief form was used to inform the participant of the title of the study and what it aimed to achieve. It was also used to provide the participant with information about the researcher and a method through which the researcher could be contacted. It informed the participant of the requirements that would be expected of them in order to take part in the research and detailed the process through which their participation would be completed. A consent form was also provided which asked participants to read six statements and tick them in order to ensure they understood the information provided and agreed to take part in the research.

A short demographic questionnaire was developed by the researcher to determine the gender and age of participants. It asked participants to provide their weight and height in order to calculate body mass index (BMI). It was also used to establish whether the participant took part in exercise as part of a team, individually or did not exercise at all.

Self generated psychological measures to test for support, context control, happiness and physical activity were developed by the researcher in order to assess participants in these areas.

In terms of support a 5-item scale was administered to determine the role of social support in participant's lives. An example of an item asked was "I have been getting emotional support from others." There was a possible four responses ranging from; 1. I haven't been doing this at all to 4. I have been doing this a lot. Cronbach's alpha revealed the reliability of the scale to be .87.

In relation to context control a 3-item measurement was used. An example of a question included was ; "I often feel I don't have enough control over the decisions I have to make". Participants were asked to respond on a 5 point likert scale from 5 strongly agree to 1 strongly disagree.

In the case of happiness, a 5-item scale was administered to determine the happiness levels of participants. "I am satisfied with my life" is an example of a question used in the scale. Participants were again required to respond on a 5 point likert scale from 5 strongly agree to 1 strongly disagree. Cronbach's alpha for the scale found the reliability for the measurement to be .88.

Finally ten questions were directed to participants in relation to their physical activity. Items ranged from direct questions such as "How many times during the last 7 days did you participate in cardiovascular training? (as part of a team or individually)" to broader questions such as "Why do you participate in this sport/exercise?"

The Perceived Stress Scale (Cohen, Kamarck & Mermelstein, 1983)

The Perceived Stress Scale was used to determine participants perception of recent stressful events in their lives. The Perceived Stress Scale is the most widely used psychological instrument for measuring an individual's perception of stress. It measures the degree to which the participant appraises their lives as stressful, unpredictable, uncontrollable and overloaded. (Cohen et al, 1983). It is a ten item self report questionnaire (originally 14-item) that asks the participant to evaluate their feelings and thoughts in relation to stressful situations that may have occurred in their lives during the previous month. All items are easy for the participant to read and understand.

Examples of the items asked include: 1. In the last month, how often have you been upset because of something that happened unexpectedly? and 2. In the last month, how often have you felt that you were unable to control the important things in your life? Responses are clearly established by asking the participants to indicate how often they felt or thought a certain way using a 5 point scale that ranges from 1 never to 5 very often. The perceived stress scale has a high internal consistency with alpha scores ranging from .84 to .86. The retest reliability was .85 after two days and .55 after a six week period. (Cohen et al, 1983)

The Satisfaction with Life scale (slightly altered) (Diener, Emmons, Larsen & Griffin, 1985)

The Satisfaction With Life Scale is a short 5- item scale used to assess participants satisfaction with their lives as a whole. It allows participants to appraise areas such as health or finances in whatever way they chose in order to achieve an overall picture of their life satisfaction. Participants are asked to indicate how much they agree or disagree with each item using a 7 point likert scale that varies from 7 strongly agree to 1 strongly disagree. In most ways my life is close to my ideal and there is nothing in my life I want to change are examples of items found within the scale. The life satisfaction scale has a coefficient alpha of .87 and a two month test retest correlation coefficient of .82 which decreases to .54 over a longer period of time. (Diener et al, 1985). For the purposes of this study one item from the scale (The conditions of my life are excellent) was removed and replaced with a self generated item. (I have fulfilling relationships with family and friends). This was done in order to determine a more overall opinion of life satisfaction and it was felt that the item removed was already determined through the use of the other items. The likert scale was also shortened to a 5 point scale ranging from 5 strongly agree to 1 strongly disagree in order to achieve a more honest and detailed representation of the participant's satisfaction with life.

The General Health Questionnaire (Goldberg, 1978)

The General Health Questionnaire is widely used to determine general well-being and distress among participants. It was developed in order to detect an individual's likelihood to have or to be at risk of developing psychiatric disorders. It measures for a number of mental health problems such as depression, anxiety, somatic symptoms and social withdrawal. Several versions in terms of the length of the questionnaire are available (12, 28, 30 or 60 items). For the current research the GHQ-12 item was used. Examples of some of the items asked include; "Have you recently lost much sleep over worry?" and "Have you recently felt that you are playing a useful part in things?". Each item is accompanied by four possible responses which participants are asked to choose from. Examples of responses include "not at all", "no more than usual", "rather more than usual" and "much more than usual". Responses were scored from 1 to 4 respectively. Reliability coefficients have ranged from 0.78 to 0.95 in a number of studies. (Jackson, 2007).

The Generalised Self-Efficacy Scale (Schwarzer & Jerusalem, 1995)

The Generalised Self-Efficacy Scale is a 10-item psychometric scale that was created to assess participants' perceived self-efficacy to cope with difficult or stressful demands in their lives. The scale is designed for use by the general population but should not be administered to participants under the age of twelve. Examples of questions asked include; "It is easy for me to stick to my aims and accomplish my goals" and "I am confident that I could deal efficiently with unexpected events". Responses are made on a 4-point scale ranging from 1-Not at all true to 4-Exactly true. No recoding is required for the questionnaire and scores range from 10-40. Various studies have reported Cronbach's alphas ranging from .76 to .90. (Luszczynska, Scholz, & Schwarzer, 2005).

Procedure:

Before any research began the study was first approved by the ethics committee. The questionnaire for the study was then distributed online to willing participants, contacted through facebook, an athletic club, football club, basketball club and a local community centre. Each participant was provided with a copy of the questionnaire as well as an information sheet which provided them with some background information about the study and what it hoped to achieve. They were informed that the study was being carried out to examine the effect of regular physical activity in relieving stress and improving overall well-being in adults. The information sheet also emphasised that participation was entirely voluntary and that all responses were completely anonymous. A consent form was also attached where participants were asked to tick beside a list of statements to acknowledge their agreement to participate in the study. Participants were advised that the questionnaire would take between 10-15 minutes to complete. They were given as long as they needed to complete them. Participants were then thanked for their participation and provided with contact details should they require more information about the study. Responses were collected over a two week period. After all the data was collected it was entered into SPSS for analysis.

Results

Data analysis was undertaken to determine the results of the study. Both descriptive statistics and inferential statistics were carried in accordance with the hypotheses. Descriptive statistics were undertaken in order to determine the means and standard deviations of variables. An analysis of variance was carried out to see if sports participation (team, individual or none) and the type of sport participation (cardiovascular, muscular or none) had an effect on perceived stress. Correlations were assessed between the predictor variables; support, context control, self efficacy, BMI and outcome measures; perceived stress, life satisfaction, general health and happiness. Where any significance was determined the predictor variables were then entered into a regression analysis. Independent samples T-tests were carried out to look for gender differences in each outcome measures.

Means and standard deviations were determined in order to examine the findings of the first hypothesis which predicted that individuals who participated in a team sport would exhibit lower levels of stress and better overall well-being than those who exercised individually or did not exercise at all. Analyses of variance were used to analyse the differences between the three groups.

Table 1: Descriptive Statistics of outcome measures in relation to the predictor variable of type of sport participation.

	Mean	Standard Deviation	Minimum	Maximum
<u>Perceived Stress:</u>				
- A Team Sport	22.27	6.34	10	40
- Exercise Individually	26.75	6.88	13	46
- Do not exercise	33.57	5.28	17	44
- Total	29.96	7.56	10	46
<u>Life Satisfaction:</u>				
- A Team Sport	19.11	4.10	8	25
- Exercise Individually	17.49	4.26	5	24
- Do not exercise	13.86	3.98	6	21
- Total	17.14	4.55	5	25
<u>Happiness:</u>				
- A Team Sport	21.32	3.15	11	25
- Exercise Individually	19.76	3.44	8	25
- Do not exercise	16.14	3.34	8	22
- Total	19.40	3.83	8	25
<u>General Health:</u>				
- A Team Sport	32.11	2.66	26	36
- Exercise Individually	30.42	3.14	22	36
- Do not exercise	29.82	2.54	22	34
- Total	30.80	2.99	22	36

In terms of participant's perceived stress, the above table shows that those who reported participating in a team sport ($M=22.27$, $SD= 6.34$) recorded much lower levels of perceived stress than those who did not exercise at all ($M=33.57$, $SD=5.28$). In relation to those who took part in exercise individually ($M=26.75$, $SD=6.88$), they were found to display higher levels of perceived stress than those in a team sport but expressed much less stress than those who did not exercise at all and scored below the average in terms of the overall participants. ($M=29.96$, $SD=7.56$).

In the case of life satisfaction, the results show that those who participated in a team sport ($M=19.11$, $SD=4.10$) recorded the highest level of satisfaction with their lives. This was followed by those who exercised individually ($M=17.49$, $SD=4.26$). Those who did not participate in any form of exercise ($M=13.86$, $SD=3.98$) reported the least amount of life satisfaction and scored significantly less than the overall average of participants ($M=17.14$, $SD=4.55$).

In relation to happiness, participants involved in a team sport ($M=21.32$, $SD=3.15$) again scored the highest out of the three groups while those who did not participate in any exercise ($M=16.14$, $SD=3.34$) were again found to exhibit the lowest level of happiness. Those who exercised individually ($M=19.76$, $SD=3.44$) described happiness levels that exceeded those who did not exercise at all and were just above the average of overall participants. ($M=19.40$, $SD=3.83$).

Finally in regards to general health the smallest difference between groups was recorded. Participants who took part in team sports ($M=32.11$, $SD=2.66$) presented that highest degree of general health. Those who exercised individually ($M=30.42$, $SD=3.14$) reported slightly lower scores than this while those who did not exercise at all ($M=29.82$, $SD=2.54$) again were found to display the lowest score. The average score of participants ($M=30.80$, $SD=2.99$) were slightly above this.

A one way analysis of variance showed that there was a significant difference between the three groups in terms of perceived stress. ($F=(2, 117)=25.09, p <.001$), life satisfaction. ($F=(2, 117)=13.15, p <.001$), happiness ($F=(2, 117)=19.87, p <.001$) and general health ($F=(2, 117)=5.96, p=.003$). Post hoc analysis in relation to perceived stress confirmed that the differences were significant in nature between the team sport group ($M=22.27, SD= 6.34$) with both the exercise individually group ($M=26.75, SD=6.88, p=.004$), and with the no exercise group ($M=29.96, SD=7.56, p=.000$). When looking at life satisfaction post hoc analysis confirmed that the differences were significant in nature between the no exercise group ($M=13.86, SD=3.98$) with the team sport group ($M=19.11, SD=4.10, p=.000$) and the exercise individually group ($M=17.49, SD=4.26, p=.001$). Similarly in relation to happiness, post hoc analysis confirmed that the differences were significant in nature between the no exercise group ($M=16.14, SD=3.34$) with the team sport group ($M=21.32, SD=3.15, p=.000$) and the exercise individually group ($M=19.76, SD=3.44, p=.000$). However there was no significant relationship between the team sport group and the exercise individually group. Post hoc results revealed no significant differences between the three groups in relation to general health.

Similarly means, standard deviations and analyses of variance were conducted to evaluate the second hypothesis which looked at the effect of different types of exercise (cardiovascular, muscular, a combination or no exercise) in reducing stress and improving well-being in adults. A one way analysis of variance showed that there was a significant difference between the four groups in terms of perceived stress. ($F=(3, 116)=18.39, p <.001$), life satisfaction ($F=(3, 116)=12.27, p <.001$), and happiness ($F=(3, 116)=16.14, p <.001$).

In relation to perceived stress, post hoc analysis confirmed that the differences were significant in nature in regards to the no exercise group (M=34.45, SD=7.59) with each of the other types of exercise; cardiovascular (M=25.34, SD=6.99, p=.000), muscular (M=23.00, SD=6.09, p=.000) or combination (M=24.39, SD=4.77, p=.000). Similar significant findings were determined in the post hoc analysis in regards to life satisfaction with the no exercise group (M=13.28, SD=3.94) and cardiovascular (M=17.78, SD=4.00, p=.000) and combination group (M=18.82, SD=4.30, p=.000). Life satisfaction was not significant between the no exercise group and muscular group. muscular (M=18.10, SD=2.47, p=.008). Significant findings were again seen in the post hoc analysis of happiness with the no exercise group (M=15.79, SD=3.61) and the three other types of exercise; cardiovascular (M=20.47, SD=3.04, p=.000), muscular (M=21.70, SD=2.36, p=.000) or combination (M=20.37, SD=3.32, p=.000). However there was no significant difference for perceived stress, life satisfaction or happiness between each of three exercise groups (cardiovascular, muscular or combination) in relation to each other. In terms of general health a one way analysis of variance showed that there was not a significant difference between the four groups. ($F(3,116)=3.76, p=.013$).

Table 2: An independent samples t-test displaying the difference between males and females for various variables

Variables	Groups	Mean	SD	t	df	p
Perceived Stress	Males	24.88	8.32	-2.983	105	.004
	Females	28.90	6.23			
Life Satisfaction	Males	17.05	4.95	-.209	118	.835
	Females	17.23	4.17			
Happiness	Males	19.83	4.16	1.187	118	.238
	Females	19.00	3.46			
General Health	Males	31.21	2.85	1.450	118	.150
	Females	30.42	3.09			

Note: p significant at .05 level.

The next hypothesis attempted to distinguish gender differences among participants through the use of an independent samples t-test. Females (M=28.90, SD=6.23) were found to report significantly higher levels of perceived stress than males (M=24.88, SD=8.32). The 95% confidence limits shows that the population mean difference of the variables lies somewhere between -6.698 and -1.350. The independent samples t-test found that there was a statistically significant difference between the perceived stress levels of males and females ($t(105) = -2.983, p = .004$). Therefore the null can be rejected.

In relation to life satisfaction, females (M=17.05, SD=4.17) were found to display higher satisfaction with their lives than males (M=17.05, SD=4.95). The 95% confidence limits shows that the population mean difference of the variables lies somewhere between -1.826 and 1.478.

The independent samples t-test found that there was not a statistically significant difference between the life satisfaction of males and females ($t(118) = -.209, p = .835$). Therefore the null cannot be rejected.

Females ($M=19.83, SD= 3.46$) were determined to exhibit lower levels of happiness than males ($M=19.00, SD= 4.16$). The 95% confidence limits shows that the population mean difference of the variables lies somewhere between $-.554$ and 2.209 . However the independent samples t-test found that there was not a statistically significant difference between happiness in males and females ($t(118)=1.187, p= .238$). Therefore the null cannot be rejected.

Finally in regards to general health females ($M=30.42, SD=3.09$) were reported to display lower levels than males ($M=31.21, SD=2.85$). The 95% confidence limits shows that the population mean difference of the variables lies somewhere between $-.288$ and 1.863 . The independent samples t-test found that there was not a statistically significant difference between general health in males and females ($t(118)=1.450, p= .150$). Therefore the null cannot be rejected.

In order to examine the hypothesis that determined that predictor variables; support, context control, general self-efficacy and BMI would have an effect on outcome measures; perceived stress, life satisfaction, happiness and general health. Pearson's r correlation coefficients was carried out and where any significance was determined predictor variables were then entered into regression analysis through linear regression.

A Pearson's r correlation coefficient was carried out to assess the relationship between each outcome measure; perceived stress, life satisfaction, happiness and general health and the predictor variables; support, context control, self efficacy and BMI.

There was a correlation between perceived stress and context control ($r=-.691$, $n=120$, $p=.000$), life satisfaction and context control ($r=.540$, $n=120$, $p=.000$), happiness and context control ($r=.589$, $n=120$, $p=.000$) and general health and context control ($r=.419$, $n=120$, $p=.000$). There was also a correlation found between perceived stress and general self-efficacy ($r=-.633$, $n=120$, $p=.000$), life satisfaction and general self-efficacy ($r=.591$, $n=120$, $p=.000$), happiness and general self-efficacy ($r=.647$, $n=120$, $p=.000$) and general health and general self-efficacy ($r=.284$, $n=120$, $p=.002$). Finally a correlation was determined between happiness and support ($r=.230$, $n=120$, $p=.012$) and general health and support ($r=-.221$, $n=120$, $p=.015$)

There was no correlation between perceived stress and support ($r=.050$, $n=120$, $p=.588$) or life satisfaction and support ($r=.066$, $n=120$, $p=.475$). There was also no correlation found between perceived stress and BMI ($r=.026$, $n=120$, $p=.781$), life satisfaction and BMI ($r=-.082$, $n=120$, $p=.374$), happiness and BMI ($r=-.046$, $n=120$, $p=.616$) or general health and BMI ($r=.097$, $n=120$, $p=.292$).

Table 3: The regression coefficients table for the final model is shown below.

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.509	1.424		3.167	.002
	Support	.176	.060	.193	2.904	.004
	Context Control	.549	.140	.335	3.907	.000
	General Self-Efficacy	.239	.050	.410	4.752	.000
	*PV:happiness					
2	(Constant)	27.070	1.337		20.248	.000
	Support	-.146	.058	-.205	-2.506	.014
	Context Control	.526	.105	.411	5.023	.000
	*PV: general health					
3	(Constant)	54.327	2.396		22.672	.000
	Context Control	-1.568	.264	-.485	-5.947	.000
	General Self-Efficacy	-.373	.094	-.324	-3.970	.000
	*PV: perceived stress					
4	(Constant)	3.046	1.656		1.839	.068
	Context Control	.534	.182	.274	2.928	.004
	General Self-Efficacy	.288	.065	.416	4.441	.000
	*PV: life satisfaction					

1. PV: Happiness. R squared = .507, Adjusted R squared = .494

2. PV: General Health. R squared = .218, Adjusted R squared = .204

3. PV: Perceived Stress. R squared = .540, Adjusted R squared = .532

4. PV: Life Satisfaction. R squared = .393, Adjusted R squared = .383

The final regression model explained 49.4% of the variance in happiness scores. Linear regression was conducted to determine the effect of happiness on support, context control and general self efficacy. Context control and general self-efficacy accounted for the most variance in happiness as seen in the table above. As self efficacy, context control and support increases so does happiness.

As seen in the table 20.4% of the variance in general health can be explained by the predictors support and context control. As support goes up general health improves. As context control increases, general health decreases.

The above table also shows that 53.2% of the variance in perceived stress can be explained by context control and general self-efficacy. As context control and general self-efficacy decreased perceived stress increased.

In terms of life satisfaction the final regression model explained 38.3% of variance in scores. As context control and general self-efficacy increased so did life satisfaction.

Discussion

The results of the present study both replicate and extend upon earlier research on the positive effects of exercise in overall health and psychological well-being. The purpose of this study was to establish the relationship between regular physical activity in relieving stress and improving overall well-being in adults. In general the results of this study suggest that regular exercise is significant in relieving perceived stress among adults. The findings of the study support the original hypothesis that individuals who participate in regular exercise experience lower levels of stress than those who do not. Both of the hypotheses which examined rates of physical activity revealed that participants who took part in no exercise at all suffered from higher levels of perceived stress and much lower levels of happiness, life satisfaction and general health in comparison to those who participated in any form of exercise whether it was as part of a team or individually; muscular, cardiovascular or a combination of both. In regards to the hypothesis which predicted that individuals who exercise regularly as part of a team would describe lower levels of stress and better overall well-being than individuals who exercise on their own, because of the social aspect involved in team sports, the results were quite significant. Participants of the study who reported their involvement in team sports were found to have significantly lower levels of stress than those who exercised alone. In terms of the hypothesis which looked at the difference between the type of exercise (cardiovascular or muscular or combination) and the reduction of stress, the findings suggest that a combination of both is the most effective in improving overall general health. Gender differences highlight that females reported significantly higher levels of stress than males. Surprisingly healthy body mass index was not found to have a correlation with improved life satisfaction, happiness, perceived stress or general health.

This was unexpected especially as when asked why participants took part in exercise nearly all responders gave reasons such as "to maintain a healthy weight", "to lose weight", "to keep fit and in shape" or "to stay healthy". It was established that as self-efficacy improves perceived stress is diminished. Similarly as social support increases general health is improved. Interestingly as context control is enhanced happiness improves however general health decreases. A potential explanation for this that although feeling a sense of control can cause an individual to feel happier, it is hard to achieve this and as a result general health can suffer in the attempt to reach happiness. This is an interesting finding however because context control is control which an individual can acquire as opposed to the locus of control. Therefore this suggests that it is possible to achieve both context control and as a result happiness if the individual works hard towards this.

The above results complement current reports that improved mental health and well-being is a natural outcome of exercise. (Hansen et al, 2001). The findings of this study support the claim that exercise appears to be most useful in the management of negative disorders on mental health, particularly stress. (Ensel & Lin, 2004). A potential explanation for the ability of exercise to prevent and relieve stress is the observation by Estivill (1995). He suggests that regular participants of exercise achieve temporary relief from daily stress and that any potential stress they may feel is replaced by a pleasant and calm state of awareness, as a result of the hormones released during physical activity. Exercise provides individuals with a break from stressful life events or an attentional focus (Brown, 1991). In addition, because in today's society individuals are constantly informed of the large number of benefits in terms of health and well-being that exercise offers an expectancy effect could be responsible for enhancing the perceived improvements in an individual's sense of well-being. (Desharnais, Jobin, Côté & Lévesque, 1993).

Individuals who engage in exercise often experiences a sense of mastery or control over bodily functions which then leads to improved well being. A state of meditation is often achieved as a result of exercise. (Folkins & Sime, 1981). Engaging in exercise is also known to cause a sense of accomplishment and enhanced self-efficacy which may be responsible for improvements in well-being and reduction in stress. As determined in this study self-efficacy can have a huge effect in improving important variables in an individual's life particularly happiness and general health which both contribute towards a reduction in stress. (Doyne, et al, 1988). Another cause which may contribute to the ability of exercise to reduce stress is the cohesiveness of the group in which individuals participant in. (Courneya, 1995 as cited in Hansen et al, 2001). This assumption corresponds strongly with the findings of this study which determined that participating as part of a team is more beneficial than exercising alone in order to relieve stress.

In addition in terms of the findings which suggested participating as part of a team is more beneficial than exercising alone, it can be concluded that the social aspect involved provides a additional aid in reducing the levels of stress and improving overall well-being as a result of the support provided by team members and the extra enjoyment this brings. This finding contradicts with Lazarus's (2000) claim that competitive sport is stressful as a result of the pressure to perform well. (Lazarus's, 2000 as cited in Poliseo & McDonough, 2012).

A strength of this study was its analysis of the different types of exercise (cardiovascular, muscular or combination) in the reduction of perceived stress and overall well being. A huge amount of the research into the area of physical activity and stress centres around cardiovascular fitness only. (Brown & Siegel, 1988). The findings of this study suggest that a combination of different types of exercise is the most effective in the reduction of stress.

This study is therefore able to support the findings of the study by Doyne and associates (1987) which concluded that it is not necessary for exercise to improve cardiovascular fitness in order to reduce stress and depression.

Another strength of the study was the fact it examined both males and females and included participants across a range of ages, unlike a lot of the previous research in the area. (Folkins & Sime, 1981). Results showed that women reported much higher levels of perceived stress than men. While this could be simply because the women participants were more stressed than men, it could also be a result of the fact that women are often found to be more tuned in to their feelings and more open when asked to report them. Exercise is an important stress reliever for men because often men are less likely to talk about their problems or seek help from social support when they are feeling stressed. Another factor which could explain differences between participants in terms of gender and overall is because some people view themselves more negatively while other people take a more positive outlook on life. (Brown, 1991). As a result of this individuals can differ in their ability to profit from physical activity because of their differences in perceptions, beliefs and coping styles.

This study also examined life satisfaction and happiness in addition to perceived stress and general health. Findings revealed that individuals who participated in regular exercise displayed higher levels of both happiness and satisfaction with their lives. This was an important finding as previous studies had focused only on mood and general health in terms of well-being. (Netz et al, 2005). Studies have been shown to link sports participation to popularity and social adjustment which can lead to happiness and satisfaction for individuals. (Stevenson, 1975, as cited in Folkins and Sime, 1981).

While this study has a number of strengths there are also some limitations which were discovered which must be discussed. One weakness of the study was the fact that participants seemed to be confused when answering the question which determined what type of exercise they took part in. Participants who selected muscular training then went on to describe walking or jogging when asked to provide details about their exercise method. It would be recommended that if further study was looked at in this area that the researcher provide a more clearer description of the different types of exercise in order to prevent this confusion.

Another limitation is that there was not an equally distribution of participants who took part in a team sport, exercised individually or did not exercise at all. This could have had an effect on results because there was not as many non-exercisers as there were in the other groups. Also gender differences within the groups were not analysed.

As a result of the findings of this study, it is suggested that further research should examine the effect of the duration and frequency of physical activity in relieving stress and improving overall well-being in adults. It would be interesting to determine if too much exercise can have a negative effect on stress and well-being. It would also be intriguing to determine exactly how much exercise is required in order to achieve the positive effects of physical activity. Currently research recommends thirty minutes of moderate exercise daily. (Hansen et al, 2001). It would also be advised that future research take a more experimental approach because this study relied on participants providing information about their physical fitness and perceived stress which may not be as accurate as if their fitness and stress levels were tested and observed in a experimental setting.

In conclusion this study attempted to determine the effect of regular physical activity in relieving stress and improving overall well-being in adults. Findings confirmed that there is a strong significant relationship between exercise and stress reduction. Team sports were found to be the most beneficial in reducing stress however individuals who participated in exercise individually also displayed much lower levels of stress than those who did not exercise at all. A combination of different types of exercise was suggested in order to achieve the most health benefits and both cardiovascular and muscular training were shown to achieve positive health effects. Interestingly body mass index and general health did not seem to have a huge impact on participants perceived stress, happiness and life satisfaction. However context control, social support and self-efficacy were found to have huge benefits in improving individuals well-being especially when combined with a regular physical activity regime. Further research is required to examine how duration and frequency of exercise effects the reduction of stress and improvement in well-being and research is also suggested to determine how long the effects of exercise last for the individual. A experimental approach for future study is advised. Overall this study has proved the hypothesis that that regular physical activity reduces stress and improves overall well-being in adults.

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Appendix 1: Copy of Questionnaire



Study title - The effect of regular physical activity in relieving stress and improving overall well-being in adults.

My name is Roseanne McKenna. I am a final year undergraduate student of Psychology in Dublin Business School. I am carrying out research to determine the effect of regular physical activity in relieving stress and improving overall well-being in adults. I am asking anyone over the age of 18 to take part in a questionnaire which will examine how much stress you perceive in your daily life and how much exercise you are currently participating in. The questionnaire will take approximately 15 minutes to complete.

Your participation in completing the questionnaire is entirely voluntary and all your responses are anonymous. All the information that you consent to provide will be treated in strictest confidence and will be held securely. Once the results have been analysed for the purpose of this study they will be destroyed. The results will be used to examine the relationship between stress and regular exercise in improving overall well-being in adults.

The main aim of this study is to expand upon the previous research supporting the belief regular exercise relieves stress and improves overall well-being and also to determine the differences between exercising as part of a team or individually in the level of this reduction in stress.

If you have any queries about the study beyond that provided here please feel free to contact me at [REDACTED]

Consent Form

Please tick:

1. I agree to participate in this research. _____

2. I realise that I may withdraw from the study at any time while completing the questionnaire, however once the questionnaire has been submitted I will be unable to withdraw from the study because all questionnaires are anonymous. _____

3. I recognise that all personal information provided by myself will remain anonymous. _____

4. I understand that the information I contribute in completing the questionnaire may be looked at and analysed by the researcher Roseanne McKenna and her supervisor Chris Gibbons. _____

5. I confirm that I have read and understand the participant information sheet for the above study. I have had the opportunity to consider the information and ask any questions necessary. _____

6. I have been given full information regarding the aims of the research and have been given information with the Researcher's names on and a contact number and address if I require further information. _____

Please answer in the following questions:

Age: _____

Gender: Male: _____ Female: _____

Weight: _____ (pounds, stone or kgs)

Height: _____ (feet, inches or metres)

Do you participate in:

A team sport: _____

Exercise individually: _____

Do not exercise at all: _____

The questions in this section ask you about your feelings and thoughts.

In each case, you will be asked to indicate by numbering how often you felt or thought a certain way during the last month.

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly? _____

2. In the last month, how often have you felt that you were unable to control the important things in your life? _____

3. In the last month, how often have you felt nervous and stressed? _____

4. In the last month, how often have you felt confident about your ability to handle your personal problems? _____

5. In the last month, how often have you felt that things were going your way? _____

6. In the last month, how often have you found that you could not cope with all the things that you had to do? _____

7. In the last month, how often have you been able to control irritations in your life? _____

8. In the last month, how often have you felt that you were on top of things? _____

9. In the last month, how often have you been angered
because of things that were outside of your control? _____

10. In the last month, how often have you felt difficulties
were piling up so high that you could not overcome them? _____

Insert a number besides the item that applies to you:

1. I haven't been doing this at all
2. I've been doing this a little bit
3. I've been doing this a medium amount
4. I've been doing this a lot

11. I have been getting emotional support from others _____

12. I have been getting help and advice from other people _____

13. I have been getting comfort and understanding from someone _____

14. I have been expressing my negative feelings _____

15. I have been confiding in someone I trust _____

Respond on a 5 point likert scale from Strongly Agree to Strongly Disagree:

1 = Strongly Agree 2 = Agree 3= Neutral 4 = Disagree 5 = Strongly Disagree

16. I often feel I don't have enough control over the decisions I have to make _____
17. In general I feel in control of the things that happen to me _____
18. The pace of learning often leaves me with little feeling of control _____
19. In most ways my life is close to my ideal _____
20. There is nothing in my life I want to change _____
21. I have fulfilling relationships with family and friends _____
22. I am satisfied with my life _____
23. So far I have gotten the important things I want in life _____

24. I am very happy _____

25. I often experience joy and elation _____

26. I feel that life is very rewarding _____

27. I have warm feelings towards most people I know _____

28. I am optimistic about my future _____

The following items ask about your general health *over the past few weeks*. Please answer all the questions simply by circling or emboldening the answer that you think most nearly applies to you. Remember that we want to know about your present and recent complaints, not those you had in the past. It is important that you try to answer all the questions.

Have you recently:

29. been able to concentrate on whatever you're doing?	Better than usual	Same as usual	Less than usual	Much less than usual
30. lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
31. felt that you are playing a useful part in things?	More so than usual	Same as usual	Less useful than usual	Much less useful
32. felt capable of making decisions about things?	More so than usual	Same as usual	Less so than usual	Much less capable
33. felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
34. felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual

35. been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
36. been able to face up to your problems?	More so than usual	Same as usual	Less able than usual	Much less able
37.been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
38. been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
39. been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
40. been feeling reasonably happy, all things considered?	More so than usual	About same as usual	Less so than usual	Much less than usual

	Not at all true	Barely True	Moderately true	Exactly true
41. I can always manage to solve difficult problems if I try hard enough.	1	2	3	4
42. If someone opposes me, I can find means and ways to get what I want.	1	2	3	4
43. It is easy for me to stick to my aims and accomplish my goals.	1	2	3	4
44. I am confident that I could deal efficiently with unexpected events.	1	2	3	4
45. Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
46. I can solve most problems if I invest the necessary effort.	1	2	3	4
47. I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4
48. When I am confronted with a problem, I can usually find several solutions.	1	2	3	4

49. If I am in a bind, I can usually think of something to do.	1	2	3	4
50. No matter what comes my way, I'm usually able to handle it.	1	2	3	4

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

51. During the last 7 days, on how many days did you do vigorous physical activities?

_____ days per week

_____ did not exercise

52. How much time did you usually spend doing vigorous physical activities on one of those days?

_____ hours per day

_____ minutes per day

_____ did not exercise

53. Which of the following best describes the type of exercise you took part in? (As part of a team or individually)

Cardiovascular Training _____

Muscular Training _____

Combination of the two _____

Did not exercise _____

54. How many times during the last 7 days did you participate in cardiovascular training?

(as part of a team or individually):

_____ days per week

_____ did not exercise

55. How much time did you usually spend doing cardiovascular training on one of those

those days?

_____ hours per day

_____ minutes per day

_____ did not exercise

56. How many times during the last 7 days did you participate in muscular training? (as part

of a team or individually):

_____ days per week

_____ did not exercise

57. How much time did you usually spend doing muscular training on one of those

days?

_____ hours per day

_____ minutes per day

_____ did not exercise

58. Please give details of the type of sport/exercise you are involved in: (for example if you play for a team; name the sport, if you exercise individually describe how; is it in a gym, out running or an individual sport)

_____ do not exercise

59. Why do you participate in this sport/exercise:

_____ do not exercise

60. The best thing about sport/exercise is:

_____ do not exercise

Thank you very much for taking part in this questionnaire. If you have any further questions or have been affected by any of the issues raised in the questionnaire please do not hesitate to contact me at [REDACTED].

Some Support Services for Stress:

1. Samaritans: 1850 609090

<http://www.samaritans.org/ireland>

2. Aware: 1890 303 302

www.aware.ie

3. Dublin City Stress Clinic: (01) 2881788

<http://www.stjohnofgodhospital.ie/stress-clinic.html>