The Effects of Yoga-Based Practices on Emotion Regulation, Perceived-Stress and Life-Satisfaction in Adulthood

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Abstract

The purpose of this study is to examine the relations of yoga-based practices on life-satisfaction, emotion regulation and perceived-stress. One hundred and sixty one participants (69 males and 92 females) from a sample of convenience using the snowball effect were surveyed via social networking site (n=112) and recruited from 2 yoga studios and a restaurant (n=50). Four sample groups (27 Yoga; 55 Activity; 40 Yoga/ Activity; and 39 No Yoga or Activity) were assessed on scores of Perceived-Stress, Satisfaction with Life, Cognitive Reappraisal and Emotion Suppression. LSD Mean comparison, Pearson correlation and T-tests were used in order to accept or deny hypotheses. Yoga practice groups scored higher results in Satisfaction with Life and Cognitive Reappraisal, and lower means in Perceived-Stress and Emotion Suppression. Significant positive relationship was found between yoga practices and Satisfaction with Life Scale and Cognitive Reappraisal. However it was difficult to find significant relations between yoga practices and Emotion Suppression and Perceived Stress. It can be concluded that yoga has positive effect on Satisfaction with Life and Cognitive Reappraisal, and very little or no effect on Emotion Suppression and Perceived-Stress.
Introduction

Yoga is an ancient practice originating in East Asia which become very popular in the West for maintaining psychological and physiological well-being (Birdee et al., 2008) as well as treating various mental and physical ailments (Kuntsevich et al., 2010). This section will briefly define and discuss the different types of yoga such as hatha, pranayama and bhakti yoga as a context to the present research. Also, previous research will be discussed that requires close attention to yoga-based practices and its impact on physical, psychological and emotional well-being in order to direct the hypothesis and methods of the current research.

The records on yoga are found in many ancient scriptures and Rig Veda is believed to be the earliest, dating back to 1700-1100 BC (Brisbon & Lowery, 2011). There was a primary focus on spiritual well-being and yoga was defined as 'the union of the individual self with the Universal Self' (Iyengar, 2011, 4). The word yoga has its roots with the word 'yug' which means 'to yoke' that refers to the union of mind and body for spiritual self-realization (Birdee et al. 2008). Yoga incorporates variety of practices, each focusing on specific areas, connected to body, the mind and/or spirit.

Hatha yoga refers more to the physical aspect of yoga with the focus on slowly moving through sequences of physical postures (asanas) synchronized with deep controlled breathing. Student focuses on body alignment, relaxing muscles and observing the way body reacts to each asana (Brisbon & Lowery, 2011). This practice helps to stay in awareness of the present moment and reach deep relaxation. And also allows the body to become toned, flexible with an increase of blood circulation throughout the body (Iyengar, 2011).
The next step after asana practice is pranayama, where prana refers to vital life-force energy that enables one to function. In Eastern philosophy pranayama is believed to be "the connecting link between the body and the soul of man, and the hub in the wheel of yoga" (Iyengar 2011, xxi). It literally refers to breath control which affects rhythmic expansion of the lungs that allows the proper circulation of the bodily fluids within internal organs. Therefore it cleanses the sense organs that aids in curing diseases; and allows the mind to become steady and undisturbed (Iyengar, 2011; Jois, 2002). There are many different types of pranayama, some are used in combination with asanas, or as a separate practice.

A study was conducted by Martarelli et al. (2011) on 16 athletes, measuring the effects of diaphragmatic breathing (i.e. pranayama). Eight athletes spent 1 hour focusing on relaxation by diaphragmatic breathing on their own in a quiet place after exhaustive training sessions. Another eight participants formed a control group, which spent time in the same settings breathing normally. The study found that antioxidant defence status increased, cortisol levels decreased and melatonin levels increased significantly in the first group compared to the control group. This implies that proper diaphragmatic breathing may protect athletes from the impact of free radicals in the long-term (Martarelli et al., 2011).

Once an individual has undergone previous stages and is able to have stability of body and mind, then can move to other practices of meditation (dhyana). This refers to focusing the mind on a particular object. For instance, one observes the physical processes of the body and mental states in search of the innermost being (Iyengar, 2011). Also there is similar practice of mindfulness which refers to being aware of experience without judgement at the present moment and accepting it (Aldahadha, 2013).
Other types of meditation such as *mantra* and *japa* belong to *bhakti* yoga, which focuses solely on individuals' spiritual well-being and refers to the aim to develop 'devotional faith' and unconditional love in Supreme Being so that self-realization may be attained (Pavulraj, 2011). Mantra yoga uses the power of sound, more specifically, the words in Sanskrit that conveys a "spiritually beneficial vibratory potency" (Yogananda, 2001, p. 475) and elevates one mind into higher plane (Desikachar, 1995). This requires the practitioner to concentrate on repetition of particular 'root-sounds' for some period of time out loud or silently in one's mind. These sounds traditionally are comprised of the names of Divine Being (God) which are different in each yogic tradition. The silent mantra yoga meditation can be done by repeating silently or in the mind; or can involve the use of *mala*, the 'chanting beads'; it refers to *japa* meditation (Sivananda, 2005). There are few studies conducted measuring how *mantra* yoga affects individuals’ wellbeing.

A study conducted by Bormann & Carrico (2009) aimed to examine the effects of group-based *mantram* intervention on positive reappraisal coping as internal mechanism (e.g. "tried to look on the bright side of things"). One group of 46 participants received a group-based *mantram* intervention. The control group of 47 attention-matched individuals in a general sample of immunodeficiency virus-positive (HIV) adults viewed video tapes consisting information about HIV, followed by a discussion. The focus of this study was on anger reduction in terms of positive reappraisal and distancing coping were examined as potential mediators. The study reported a significant increase in positive reappraisal coping in *mantram* intervention participants over 5-week period compared to control group reported decreases. After 22-week follow up the researchers recorded decreased anger in *mantram* group. Thus the study shows that mantra-based therapy may be effective in reducing anger by enhancing positive reappraisal coping.
Another study was set up by Bernardi et al. (2001) for 23 healthy individuals who have never done mantra or rosary recitation, to explore the effects of rosary recitation and yoga mantras on inherent cardiovascular rhythms and baro-reflex sensitivity. Respiration was recorded during and after every cycle of mantra and rosary recitation; also during free talking and controlled breathing sessions. Researchers observed that both prayer and mantra enhanced and synchronized the existing cardiovascular rhythms and increased sensitivity to baroreflex (predictor of heart disease) significantly compared to free talking and controlled breathing. Because during recitation the respiration slows down to almost six respirations per minute, which is the same for endogenous circulatory rhythms, thus favourable psychological and possibly physiological effects may result. Showing

Recently, these different yoga types become very popular in the West and were applied as a lifestyle changes and therapies to increase physical, mental, emotional and spiritual well-being (Gangadhar & Varambally, 2011). There have been a number of studies conducted measuring the effects of yoga on individuals with different psychological conditions such as depression, schizophrenia, stress and anxiety; and physical such as epilepsy, asthma, diabetes mellitus, cancer and physical pain. Many studies showed that yoga is currently applied as the therapy, lifestyle modification programs, prevention and treatment of particular diseases (Birdee et al. 2008) and its application will be discussed in the following sections in terms of psychological health, emotional intelligence, stress and anxiety, and quality of life.

Yoga as Therapy and Lifestyle Modification Programs
Yoga-based practices have been widely applied as Intervention therapies that found positive impact of yoga on the physiological or psychological state of people with psychiatric disorders such as depression, anxiety and schizophrenia (Gangadhar & Varambally, 2011). Naveen et al. (2013) conducted a study with outpatients of depression. Two groups were practicing yoga for three months: one group with medication, the second group without medication; third group received only medication. The study found that two groups that practiced yoga scored significantly lower on Depression Rating Scale compared to the control group (Naveen et al., 2013).

Another 12-week study was conducted by Butler et al. (2008) with 46 subjects having long-term depressive disorders. One group practiced yoga with meditation, a second group was placed in a group therapy with hypnosis and third group received psycho-education alone. After nine months follow-up, the meditation group was recorded to have significantly higher remission rates, but participants did not develop new depressive episode during the study. Symptoms have reduced among all groups but they do not differ significantly. Therefore, it is suggested that yoga practices may have more positive impact than other treatments such as hypnosis and psycho-education when treating low-to moderate-level depression.

The positive impact of therapies was found on people suffering from neurological disorders such as epilepsy. The study involved 300 participants living with epilepsy with measurement of their knowledge, attitude and practice of yoga. Naveen et al. (2013) recorded that regular practice of yoga may help to reduce medication dosage (62.8%), their side effects (51.3%) and seizure frequency (54.5%). As neurological diseases such as stroke, multiple sclerosis and Alzheimer's disease are increasing as adult disabilities (Mishra et al., 2012); many intervention therapies were conducted to measure whether yoga-based practices have a positive
impact. In one study, 9 subjects that have suffered a stroke were placed in a 10-week yoga programme, which comprised of asana practice, meditation and pranayama. After the program participants were interviewed; they reported perceived physical improvements (strenght, walking ability) and improved feeling of calmness and acceptance of a different body (Garrett et al., 2011).

Also, yoga-based practices have been applied to eating disorders and elements associated with it such as stress, self-awareness and self-acceptance. For instance, meditation-based therapy showed positive impact on subjects suffering from binge eating disorder with an increase control over eating and awareness of hunger and decrease of depression and anxiety (Kristeller & Hallett, 1999). Another interesting study was conducted by Daubenmier (2005), which compared three groups of women on differences in self-objectification, body satisfaction and disordered eating attitudes. The first group of participants included 43 yoga practitioners; the second group consisted of 45 aerobic exercise practitioners and a control group of 51 individuals that has not practiced yoga or aerobics in the last 2 years. The study revealed that yoga practitioners had significantly greater body awareness and satisfaction, less self-objectification and lower scores on disordered eating attitudes compared to aerobics and control groups.

Yoga-based practices have been regarded as lifestyle practices that can optimize health, delay aging and ameliorate chronic illness and stress from disability (Kuntsevich et al., 2010). Thus lifestyle modification programs were conducted with subjects suffering from variety of physical ailments. One such 8-day lifestyle modification program focused on yoga as prevention for 98 heterogeneous individuals with risk factors of chronic diseases such as cardiovascular disease, diabetes mellitus and hypertension. The intervention involved asana practice, pranayama, meditation, lectures on yoga and nutrition. Fasting plasma glucose and serum
lipoprotein profile were measured before and after the intervention. Bijlani et al. (2005) found that fasting plasma glucose and levels of cholesterol were significantly lower after the program, which indicates that yoga-based practices leads to positive metabolic effects within a short-period of time. Another short-term yoga-based program was conducted on subjects suffering from chronic lower back pain (CLBP). Tekur et al. (2008) found that spinal flexibility improved significantly in subjects practicing yoga compared to control group that focused on physical exercise. The meditation-based program with cancer outpatients showed decreased levels of mood disturbance and less symptoms of stress after 7 weeks and maintained after 6 months follow-up (Carlson et al., 2001).

The previous research showed that yoga-based practices have been successfully used as therapies and lifestyle modification programs to support physical and especially the psychological health.

*Psychological Health*

A lot of research has focused on yoga practices as promotion of psychological health. Interestingly, a national survey reported by Birdee et al. (2008) found that 5.1% were practicing yoga out of 10 million adults in U.S. general population. There were 61% of respondents who practice yoga to maintain health; while 25% use yoga for medical conditions such as asthma, musculoskeletal and psychological problems. There were significant differences between individuals that practiced yoga at least a year and non-practitioners considering health status and socio-demographics. Yoga practitioners tended to be Caucasian, female; have lower smoking
and alcohol consumption rates and college education. And they reported to have significantly better musculoskeletal and mental health Birdee et al., 2008).

One study conducted by Yoshihara et al. (2011) compared 38 female long-term yoga practitioners (more than 2 years of experience) with a control group of 37 age-matched female non-experienced participants on self-rated mood states such as tension-anxiety, anger-hostility and fatigue. The study found that yoga practitioners indicated lower scores on mental health disturbances compared to control group (Yoshihara et al., 2011).

A similar study was conducted by Bhat et al. (2012), which measured the effects of 12-weeks of yoga practices on 400 industrial workers and their mental health in terms of stress and strain. Participants were divided in to four matched groups of 100; one group received yoga practice in the morning, other group was physically trained in the morning; third group was physically trained in the morning and received yoga practice in the evening, and the fourth was a control group that received neither. The study found that those who received yoga practice had reported to have more psychological benefits (i.e. reduced levels of stress and strain) compared to those who received physical training.

Correspondingly, the mindfulness-based program was conducted by Foureur et al. (2013) with twenty midwives and twenty nurses by measuring their general health. Participants received one-day workshop and undertook daily meditation for 8 weeks. Participants' health was measured prior to and after the program. The study shows that there is a significant improvement in health after the program in terms of reduced stress, anxiety and depression (Foureur et al., 2013). Many intervention programs have focused on psychological health in terms of successfully reducing stress, anxiety, depression and other mood states; in addition, other studies
have also shown that yoga has positive effects on emotional intelligence, which will be explored in the next section.

*Emotional intelligence*

Emotional intelligence is a very important aspect of person's psychological functioning that includes emotional regulation within two strategies: cognitive reappraisal and emotional suppression. Reappraisal strategy refers to experiencing and expressing greater positive emotion and lesser negative emotion with better interpersonal functioning, while suppression strategy refers to experiencing and expressing lesser positive emotion and greater negative emotion with worse interpersonal functioning (Gross & John, 2003). Most of research has concerned with emotional intelligence as all encompassing variable rather than focusing on these strategies separately.

Emotional intelligence refers to recognition of one's and others' feelings for ability to motivate one selves, express and regulate emotions well (Rathore & Choudhary, 2013). A yoga intervention carried out by Rathore & Choudhary (2013), measured emotional intelligence and subjective well-being on 30 female and 30 male participants prior to and after a yoga practice. The psychological tests revealed that after the yoga practice emotional intelligence and subjective well-being increased significantly; the difference was also found between males and females in their expression and regulation of emotions.

Another study was conducted measuring the effects of meditation on emotion and cognition in yoga practitioners and matched control group. Both groups underwent fMRI while performing an event-related affective Stroop task (image viewing with emotional distractors).
fMRI of Yoga practitioners showed a stronger activation of the amygdala and prefrontal cortex; thus allowing less emotional reactivity to negative stimuli during Stroop task. Thus, it shows that yoga practitioners have better ability to control emotional interference during cognitive task and is concluded that regular practice also suggests that yoga practices provide therapeutic benefits for people with cognitive control dysfunctions (Froeliger et al, 2012).

A similar study was done by Gootjes et al. (2011) where correlates of neurophysiology in terms of cognitive reappraisal were examined in a group of yoga practitioners and controls. Both groups were asked to cognitively change the meaning of particular image shown to a more positive interpretation. The researchers found that both groups reduced the time intervals of the late positive change; in the yogic group the reduced magnitude was sustained during later intervals, whilst in the in control group it dropped. The study found that there is a relationship between meditative practice and emotional regulation as positive effect and familiarity increased. Nonetheless, it is unclear whether meditation has direct causal effect or depends on pre-existing characteristics of the participants (Gootjes et al., 2011).

Thus it is evident that yoga-based practices positively influence emotions as part of psychological health, furthermore it is important to discuss the research on stress and anxiety which also plays one of the major role on psychological health.

**Yoga on Stress and Anxiety**

Stress is very common factor that individuals experience in everyday life. It is the main contributor along with anxiety to many chronic diseases and low quality of life (Michalsen et al., 2012). Cohen et al. (1983) noted that "high levels of stress are associated with poor self-reported
health, elevated blood pressure, depression, and susceptibility to infection”. Anxiety is generally defined as "a general feeling of apprehension about possible future danger, and fear is an alarm reaction that occurs in response to immediate danger" (Butcher et al., 2013, p.171). As both stress and anxiety have a major impact on health, researchers conducted many studies in order to improve the signs and symptoms of these factors.

Mohan et al. (2011) studied the effects of meditation on stress-induced in cognitive functions. A sample of 32 healthy male participants that have never practiced meditation were asked to practice guided meditation for 20 minutes before or after psychologic stress (induced by playing a stressful computer game). The control group was asked to wait quietly for time period equivalent to meditation. Mohan et al. (2011) measured the galvanic skin response, heart rate, electromyography, sympathetic reactivity and psychologic stress scores. It emerged that if meditation was practiced before the stressful event, it reduced the negative effects of stress and improved memory scores.

Another randomized controlled trial investigated the effects of Iyengar yoga on perceived stress in seventy-two distressed female subjects. One group received 12 yoga sessions over 3 months, a second group received 24 yoga sessions and a third was a control group. The measures included: stress, depression, quality of life, profile of Mood States. After three months women in yoga groups reported to have significant improvements in perceived stress compared to control group. Also, it is evident that the group which received the most yoga sessions had the highest reduction of stress and improvement of psychological and physical well-being (Michalsen et al., 2012).

Interestingly, Streeter et al. (2010) examined whether changes in mood, anxiety and GABA levels are due to specific yoga practice or related to physical activity. One group of
healthy subjects were assigned to a yoga practice and another group to metabolically matched walking activity three times a week for 12 weeks. The scales on mood and anxiety were taken every four weeks, and magnetic resonance spectroscopy scan was taken before intervention, 12 weeks after intervention and a third scan was taken immediately after 60-minute yoga or walking. The study revealed a positive correlation between improved mood and decreased anxiety and thalamic GABA levels with yoga practitioners reporting greater improvement in mood and displaying higher thalamic GABA levels and greater decrease in anxiety symptoms.

In addition, the pilot study was done by Staples et al. (2013) to examine the effectiveness of yoga program as a part of therapy that aims to improve symptoms of post-traumatic stress disorder (PTSD) in 12 military Veterans. Participants were asked to participate in yoga intervention twice a week for a period of 6 weeks. The study indicated that PTSD hyper-arousal symptoms and overall sleep quality had improved significantly, but there was no significant impact on total PTSD, anger or quality of life. Thus, it shows that the yoga program may be an acceptable, feasible and supportive treatment therapy of PTSD.

All previous research showed that yoga practice has a positive impact on individuals' mood states such as stress and anxiety, which are also closely related to the quality of life.

Quality of Life

Quality of life encompasses life satisfaction factor as a subjective well-being, which enables one to form a judgement concerning conditions, priorities and fulfilment of living based on individual's own criteria (Diener et al. 1985). There have been a number of studies conducted on how yoga can improve the quality of life for individuals with different conditions.
Bidwell et al. (2012) conducted a study to examine whether yoga practice can improve quality of life and heart rate variability (HVR) in 19 female patients with asthma over a period of 10 weeks. There were a group of yoga practitioners and a control group. The study revealed that 45% improvements in quality life of yoga practitioners with no changes found in control group.

Another study investigated the effects of Sahaja yoga meditation on quality of life, anxiety, and blood pressure control. Sixty-seven participants received meditation; sixty-two participants were in control group and received treatment. Both groups were similar in demographic and clinical characteristics. The groups were measured pre- and post- treatment. The findings showed that the meditation group has significantly increased quality of life, anxiety and blood pressure compared to control group, where quality of life deteriorated and no improvements in blood pressure found (Chung et al., 2012).

Furthermore, Rakhshani et al. (2010) examined whether the integrated yoga has an impact on quality of life and interpersonal relationships in normal pregnant women. Participants included 102 women between 18 and 20 weeks of gestation. They were assigned into two groups: one received yoga sessions; other received antenatal exercises as a control group, both for 1 hour three times a week from 20th to 36th week of gestation. Pre- and post- assessment revealed significant improvements in the yoga group compared to control group in terms of psychological, social and environmental areas. Thus it shows that integrated yoga may improve quality of life of pregnant women and enhance their interpersonal relations.

All previous literature has explored the relationship between the yoga-based practices and a variety of variables such as psychological and physical health, emotional intelligence, stress and anxiety and quality of life. Evidently, all of the studies demonstrated that yoga practices
have a positive impact on individuals overall health. Nonetheless, many of the studies were hindered by limitation that will be explored in the next section.

**Research Limitations and Rationale**

Even though there has been extensive research done on yoga and its effects on individuals' psychological and physical health; the majority of lifestyle modification programs and therapies focused on short-term impact of yoga (Tekur et al., 2008; Carlson et al., 2001) extending up to nine days (Bijlani et al., 2005), three months (Naveen et al., 2013) or six months (Rajak et al., 2012). There are other limitations such as small study populations (Bernardi et al., 2001; Martarelli et al., 2011); lack of randomization (Staples et al., 2013) and lack of control group (Li & Goldsmith, 2012).

Also most of the research has focused on individuals who have never done any type of yoga before (Mohan et al., 2011; Streeter et al., 2011) and suffer from some physical (Tekur et al., 2008) or mental disorder (Butler et al., 2008) with less focus on healthy subjects (Streeter et al., 2010). The previous research was also limited considering gender with only a limited number of studies comparing females and males (Rathore & Choudhary, 2013) while most of them focused solely on males (Telles et al., 2010) and others solely on females (ShariatPanahi et al., 2013).

Most of research literature such as the national survey (Birdee et al., 2008) did not distinguish between different types of yoga and did not specify the impact of duration of yoga practice; whereas only a limited amount of studies measured the impact of frequency of yoga
practice (Michalsen et al., 2012) and the length of yoga practice (Yoshihara et al., 2011). In addition, few studies have compared yoga-based practices with aerobic exercise (Daubenmier, 2005), walking (Streeter et al., 2010), physical training (Bhat et al., 2012) or other treatments such as hypnosis (Butler et al., 2008). Furthermore there is a lack of literature considering all different types of yoga such as meditation, mantra, hatha and nidra.

Most of research focused on the physical aspect of yoga (asanas) (Naveen et al., 2013; Bijlani et al., 2005) and on meditation-based practices (Butler et al., 2008; Foureur et al., 2013). The research focusing on mantra meditation is limited to only showing a positive impact on individuals by reducing anger (Bormann & Carrico, 2009) and enhancing cardiovascular rhythm (Bernardi et al., 2001), nonetheless, it fails to explore other important aspects of wellbeing.

Conversely, the research has been limited considering emotional regulation and most of studies have focused on broader aspects such as emotional intelligence (Rathore & Choudhary, 2013) and cognition (Gootjes et al., 2011). Life satisfaction has not been explored on its own but only in terms of quality of life (ShariatPanahi et al., 2013). Thus, the research on yoga-based practices and how it influences emotional regulation, levels of stress and life-satisfaction has been limited and none has been conducted in Ireland.

The use of yoga-based practices is rising for various health reasons and previous research has shown the positive impact of yoga on psychological and physiological health. However, it is important to explore the psychological aspects of human functioning by focusing on two positive elements of satisfaction with life and emotional reappraisal and two negative elements of perceived stress and emotional suppression in order to examine if these aspects relate to yoga-based practices. Furthermore, it is evident from previous studies that all the types of yoga are equally significant showing a positive impact on individuals' health, thus it is important to focus
on most common types of yoga collectively (e.g. hatha, meditation and mantra) rather than analyzing the relationship separately.

Consequently, the measure of Perceived Stress Scale (PSS-14 item; Cohen et al., 1983) is chosen as it is widely used as the most relevant measure for perceived stress an individual is experiencing within a short period of time (Li & Goldsmith, 2012). Nonetheless, it might not reflect the whole emotional spectre, thus Emotion Regulation Scale (ERQ; Gross & John, 2013) will also be used as it assesses negative and positive emotions and strategies to control them that individuals use commonly in everyday life (Gross & John, 2013). In addition, Satisfaction with Life Scale (SWLS; Diener et al., 1985) will be used as it is a measure of global and stable phenomenon of the subjective well-being and can be applied to a wide range of age groups and applications (Pavot et al., 1991).

Thus, it is important to explore how the yogic practices relate to the ability to control emotions; to investigate whether yoga practices relates to reduced levels of stress and increased satisfaction with life in general population. Consequently, considering these variables, the research may improve the knowledge of yoga-based practices in terms of having therapeutic effects in order to develop effective schemes, which would support individuals in regulating emotions, managing mental stress, increasing positive attitudes towards life, promoting healthy lifestyle and therefore reducing the risk of developing physical or psychological disorders.

**Main Hypotheses**

- It is hypothesized that people who practice yoga will have significantly higher scores on the Cognitive Reappraisal compared to people who do not practice yoga.
• People who practice yoga will have significantly lower scores on the Emotion Suppression compared to people who do not practice yoga.

• People who practice yoga will have significantly higher scores on Satisfaction with Life Scale (SWLS) than people who do not practice yoga.

• People who practice yoga will have significantly lower scores on Perceived-Stress Scale (PSS-14) than people who do not practice yoga.

• The yoga practice variables (i.e. duration and frequency of yoga practice) will positively correlate with SWLS.

• The yoga practice variables (i.e. duration and frequency of yoga practice) will negatively correlate with PSS-14.

• The yoga practice variables (i.e. duration and frequency of yoga practice) will negatively correlate with Emotion Suppression.

• The yoga practice variables (i.e. duration and frequency of yoga practice) will positively correlate with Cognitive Reappraisal.
Methods

Participants

The present study includes 161 (69 males and 92 females) adult respondents randomly selected from a general population (n=85 Irish, n=76 non-Irish respondents). Participants' age is ranging from 18 to 65 (see Table 1). Online respondents (n=112) were contacted via social networking site using the snowball effect and linked to www.qualtrics.com. While other respondents (n=50) were asked to complete paper-and-pencil questionnaire which was offered in Govinda's Yoga Centre, Dublin, Govinda's Restaurant, Dublin and Yoga Sacred Space, Wicklow. Written consent was obtained from these yoga centres (refer to Appendix A). Subjects were briefly introduced about the nature of the study and the completion of the online survey and paper-and-pencil questionnaire was recorded as consent to participate in the study. By the end of the survey participant found the contact details for support services (see Appendix G).

There are four age groups arranged every 12 years: 18-30 years old (n=67); 31-43 years old (n=70); 44-56 years old (n=18); 57 and older (n=6). The Yoga group 1 (n=27) includes all individuals that practice any type of yoga for at least a year or more and did not practiced any other activity (for more than 1 year). The Activity group 2 (n=55) includes individuals who practiced some kind of activity (e.g. sports) for at least a year or more (and did not practiced any kind of yoga for more than 1 year). No Yoga or Activity group 3 (n=39) includes individuals that do not practice any type of yoga or any type of activity including the practice of less than a year in both cases. Yoga/Activity group 4 (n=40) comprised of individuals who practice yoga and are involved in other activities for more than 1 year.
Table 1 *Age Mean and Standard Deviation of General Population*

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**Design**

The current study is conducted using a cross-sectional design. Correlational method design was also used where dependant and independent variables were calculated in order to determine the level, strength and direction of influence that independent variables have on certain dependant variables (described later in this section). The main coefficient used will be Pearson's Coefficient of Correlation; depending on this correlation the strength of a linear association between two variables will be measured.

The study assessed dependent variables of Satisfaction with Life that estimates the degree of satisfaction individual has with his/her life; also Perceived-Stress that estimates the amount of perceived stress an individual is experiencing within the last month; and Emotional Regulation that estimates 2 strategies that individuals use to regulate emotions: Reappraisal as a positive strategy and Suppression as a negative strategy.

The independent variables that are measured include gender, nationality, age, the frequency of yoga practice (range from less than once a week to every day), duration of yoga practice, the frequency of activity (range from less than once a week to every day), duration of activity and neither yoga or activity practice.

Note that while dependent variables do not have units of measurement, for they are coefficients, some of the independent variables are measured in years or indications of
frequency, however this should not create any uncertainties, because standardized coefficients
will be used.

**Materials**

All participants were asked to fill the survey, consisting of 3 scales and 1 demographic
questionnaire. The 3 scales were duplicated from the original sources and demographic
questionnaire was compiled by a researcher; nonetheless the design was slightly altered (e. g.
some words could not be changed into the italics format) for the online survey to make it more
user-friendly as there were no particular options to exactly replicate the paper version. Both
versions of the survey included a cover sheet containing information about the study, indicating
the right to withdraw and anonymity (see Appendix B). The completion of the survey was taken
as indication of consent to participate in this study.

Demographic questionnaire (see Appendix C) was used to estimate personal information
such as gender, nationality and age and whether the participants practice any type of yoga or
engage in any other activities (sports); and how often and how long they practice ('If yes, how
often do you practice?').

Satisfaction with Life Scale (SWLS; Diener et al., 1985; see Appendix D) was used to
estimate cognitive global judgements of one's life satisfaction (not a measure of either positive or
negative affect). The questionnaire includes 5 items ('In most ways my life is close to my ideal;
The conditions of my life are excellent) which required the participant to respond by using a
scale and placing suitable number in lines preceding each statement in paper-and-pencil scale
and tick an appropriate answer on the online version on the scale ranging from 1 to 7, including
Strongly Disagree to Strongly Agree. The scores were computed with the higher scores indicating individual’s greater satisfaction with life.

Within a study done by Diener et al. (1985) of 176 undergraduate students, the Cronbach’s alpha (reliability coefficient) was found at $\alpha = .87$, while test-retest (n=76; 2-month interval) was $\alpha = .82$. Internal consistency was also found at $\alpha = .83$ in a study (Pavot et al. 1991) with 53 older individuals as well as significant correlation with Philadelphia Geriatric Center Morale Scale, daily satisfaction scale and memory difference measure of satisfaction. In addition, the measure significantly correlated with Fordyce scale at $\alpha = .83$ in a study with 136 students; and test-retest (N=136; 2-wk. interval and 1-month interval) averaged $\alpha = .84$ and $\alpha = .85$ respectively (Pavot et al. 1991).

Emotional Regulation Scale (ERQ; Gross & John, 2003; see Appendix E) was used to assess the ability to control emotions; it looks at two emotion regulation strategies of Cognitive Reappraisal as a positive strategy and Emotion Suppression as a negative. The questionnaire includes 10 statements (such as: 'When I want to feel more positive emotion (such as joy or amusement), I change what I’m thinking about; I keep my emotions to myself), which required the participant to respond by using a 7-point Likert-type scale and placing suitable number in lines preceding each statement in paper-and-pencil scale and tick an appropriate answer on online version on the scale ranging from 1 to 7, including Strongly Disagree to Strongly Agree. There are two subscales in the questionnaire: reappraisal frequency (six items) and suppression frequency (four items). The total scores were calculated as means of items in Both subscales; the higher scores indicating larger frequencies of emotional regulation strategies.

This scale has been shown to have sufficient reliability in an undergraduate student sample for Both subscales: $\alpha = .79$ for Reappraisal and $\alpha = .73$ for Suppression. Test-retest
reliability (n=1,483; 3-month interval) was $\alpha = .69$ for Both subscales (Gross & John, 2003). In a study with 1,163 Chinese adults conducted by Wang et al., (2007) the consistent reliabilities of reappraisal ($\alpha = .85$) and suppression ($\alpha = .77$) were found. In addition, the test-retest reliabilities (n=49; 3-wk. interval) were $\alpha = .82$ for reappraisal and $\alpha = .79$ for suppression.

Perceived-Stress Scale (PSS-14; Cohen et al., 1983; see Appendix F) was used as to estimate the amount of perceived stress an individual is experiencing within the last month. The questionnaire includes 14 questions (such as: 'In the last month, how often have you been upset because of something that happened unexpectedly?'), which required the participant to respond by marking a scale (or ticking the appropriate answer in online version) ranging from 0 to 4, which includes Never, Almost Never, Sometimes, Fairly Often and Very Often. The scores of PSS-14 are obtained by reversing the scores (e.g. 0=4; 1=3, 2=2, etc.) of the 7 positive items: 4, 5, 6, 7, 10 and 13. All the item scores were computed with the higher scores indicating increased amount of perceived stress.

This scale has been shown to have alpha reliability of .84; .85 and .86 with three samples of college students (n=332, n=114, n=64 respectively) and has predictive correlations with other measures of stress (Job Responsibilities Scale; life events scales). Test-retest reliability (n=82; 2-day interval) was $\alpha = .85$ (Cohen et al., 1983). Internal consistency was also supported ($\alpha = .84$) by a study with a Greek sample of one hundred males and females (Katsarou et al., 2012).
Results

Descriptive Statistics

40.1% of sample population reported that they practice some kind of yoga for at least one year or more. For the greater part, almost 66% of yoga practitioners were women. Out of all (n=65) yoga practitioners 13.8% are practicing yoga less than once a week, 20% - once a week, 13.8% - twice a week, 21.5% - almost every day, and 30.7% are practicing yoga everyday.

59.9% of respondents replied that they are not practicing any kind of yoga or just started doing yoga recently (less than a year). However, slightly more than 70% of them indicated that they practice some other activity (e.g. sports) for more than a year.

When comparing the numbers accordingly to the total sample (N=161), the percentage of people involved in some kind of activities (e.g. sport) is almost 31% (for 1 year or more); 50% of them being male and 50% female; 14% of those people are exercising less than once a week, 22% - once a week, 38% - twice a week, 26% - almost every day; and none of them practice everyday.

Moreover, there were some people who have been practicing yoga and some other activity for more than 1 year (Yoga/Activity); this group of people made 24.84% of all respondents. However, other individuals (n=39), not engaging in any kind of activity (No Yoga or Activity), represent a high percentage of 24.22%. Thus, almost a quarter of respondents were practicing Both yoga and other activities and almost a quarter were engaged in neither. The Yoga group 1 (n=27) made only 16.77% of the whole sample population, while Activity group 2 (n=55) involved mainly in sports comprised 34.16% of the sample population.
The descriptive statistic analysis was carried out using independent sample T-test. In order to compare the mean of one group with the mean of another Fishers Least Significant Difference (LSD) test was used. The chosen level of significance $\alpha$ ($\alpha=0.05; \alpha=0.10$) was compared to the calculated level of significance ($p$) in order to draw conclusions whether to accept or reject the null hypothesis ($H_0$). If $p \leq \alpha$, then null hypothesis can be rejected, if $p > \alpha$, then fail to reject null hypothesis. Null hypothesis states that there is no relationship between two measured phenomena, thus its rejection will be critical in proving significant differences between various groups.

As illustrated in Table 2, Yoga/Activity group ($\bar{x}=32.58; SD (6.77)$) scored considerably higher on Cognitive Reappraisal than the other groups, with the lowest mean ($\bar{x}=27.87; SD (6.81)$) of No Yoga no Activity group.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Cognitive Reappraisal</th>
<th>Emotion Suppression</th>
<th>SWLS</th>
<th>PSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Yoga (n=27)</td>
<td>30.96</td>
<td>13.07</td>
<td>23.62</td>
<td>28.18</td>
</tr>
<tr>
<td></td>
<td>$SD (7.88)$</td>
<td>$SD (4.85)$</td>
<td>$SD (7.65)$</td>
<td>$SD (11.03)$</td>
</tr>
<tr>
<td>2. Activity (n=55)</td>
<td>28.00</td>
<td>15.11</td>
<td>22.05</td>
<td>27.74</td>
</tr>
<tr>
<td></td>
<td>$SD (6.73)$</td>
<td>$SD (5.82)$</td>
<td>$SD (7.22)$</td>
<td>$SD (7.89)$</td>
</tr>
<tr>
<td>3. No Yoga or Activity (n=39)</td>
<td>27.87</td>
<td>14.10</td>
<td>20.41</td>
<td>28.21</td>
</tr>
<tr>
<td></td>
<td>$SD (6.81)$</td>
<td>$SD (5.42)$</td>
<td>$SD (7.77)$</td>
<td>$SD (6.11)$</td>
</tr>
<tr>
<td>4. Yoga/Activity (n=40)</td>
<td>32.58</td>
<td>12.87</td>
<td>26.82</td>
<td>26.92</td>
</tr>
<tr>
<td></td>
<td>$SD (6.77)$</td>
<td>$SD (4.3)$</td>
<td>$SD (5.03)$</td>
<td>$SD (9.56)$</td>
</tr>
</tbody>
</table>

The differences of Cognitive Reappraisal score means (see Table 3) between Yoga/Activity ('Both') and Activity group and No Yoga or Activity ('None') group were found to be the largest (4.7). An independent sample T-Test (Fisher's Least Significant Difference (LSD)) found that
there was a significant difference between Yoga/Activity (Both) group and Activity group (Mean Difference = 4.58, p = 0.00) and Yoga/Activity group ('Both') and No Yoga or Activity ('None') groups (Mean Difference = 4.70, p = 0.00), thus rejecting the null hypothesis indicating that there is no significant differences between the group means.

Individuals engaged in yoga practice for more than 1 year (Yoga) also scored high in terms of Cognitive Reappraisal (\(\bar{x}=30.98\); SD (7.88); see Table 2). However mean difference between Yoga group and Activity group (Mean Difference = 2.96, p = 0.07; see Table 3) and Yoga group and No Yoga or Activity ('None') group (Mean Difference = 3.09, p = 0.08), were only significant at \(\alpha=0.1\). Thus the null hypothesis can only be rejected at \(\alpha=0.1\) significance level.

Table 3: *Mean comparison and independent sample T-tests between all groups on Cognitive Reappraisal*

<table>
<thead>
<tr>
<th>Variable</th>
<th>(I) Groups</th>
<th>(J) Groups</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Reappraisal</td>
<td>Yoga</td>
<td>Activity</td>
<td>2.96**</td>
<td>1.64</td>
<td>0.07</td>
<td>-0.27 - 6.20</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Activity</td>
<td>3.09**</td>
<td>1.74</td>
<td>0.08</td>
<td>-0.35 - 6.54</td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td>Activity</td>
<td>-1.61</td>
<td>1.73</td>
<td>0.35</td>
<td>-5.04 - 1.81</td>
</tr>
<tr>
<td></td>
<td>Yoga</td>
<td>None</td>
<td>-2.96**</td>
<td>1.64</td>
<td>0.07</td>
<td>-6.20 - 0.27</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Both</td>
<td>0.13</td>
<td>1.46</td>
<td>0.93</td>
<td>-2.75 - 3.01</td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td>Activity</td>
<td>-4.58*</td>
<td>1.45</td>
<td>0.00</td>
<td>-7.43 - 1.72</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Both</td>
<td>-3.09**</td>
<td>1.74</td>
<td>0.08</td>
<td>-6.54 - 0.35</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Both</td>
<td>-4.70*</td>
<td>1.57</td>
<td>0.00</td>
<td>-7.80 - 1.61</td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td>Yoga</td>
<td>1.61</td>
<td>1.73</td>
<td>0.35</td>
<td>-1.81 - 5.04</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>None</td>
<td>4.58*</td>
<td>1.45</td>
<td>0.00</td>
<td>1.72 - 7.43</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Both</td>
<td>4.70*</td>
<td>1.57</td>
<td>0.00</td>
<td>1.61 - 7.80</td>
</tr>
</tbody>
</table>

* - The mean difference is significant at the 0.05 level.
** - The mean difference is significant at the 0.10 level.
People who engage in activities (Activity; $\bar{x}=15.11; SD (5.82))$ recorded to use Emotion Suppression slightly more than the other groups, with Yoga group ($\bar{x}=13.07; SD (4.85))$ and Yoga/Activity (Both) ($\bar{x}=12.87; SD (4.3))$ reporting the lowest use of Emotion Suppression (see Table 2).

An Independent Samples T-Test found that the only significant mean difference in terms of Emotion Suppression (see Table 4) at $\alpha=0.05$ was between Yoga/Activity group (Both) and Activity group (Mean Difference = -2.23, $p= 0.04$), thus rejecting the null hypothesis. However, mean difference between Yoga/Activity group and No Yoga/Activity (None) group (Mean Difference = -1.23, $p= 0.30$) was not found to be significant and the null hypothesis could not be rejected.

The only other significant difference of means in terms of Emotion Suppression (at $\alpha=0.10$) was found between Yoga group and Activity group (Mean Difference = -2.04, $p= 0.10$), thus rejecting the null hypothesis that there is no significant differences between those two means. However, mean differences between Yoga group and No Yoga/Activity (None) group (Mean Difference = -1.03, $p= 0.43$) was not found significant, thus the null hypothesis could not be rejected.

As indicated in Table 2, individuals who practice yoga and engage in other activity (Yoga/Activity; $\bar{x}=26.82; SD (5.03))$ reported to be slightly more satisfied with life than the rest of the groups, while individuals not practicing yoga or any other activity (No Yoga or Activity) scored lowest ($\bar{x}=20.41; SD (7.77)$) indicating to be least satisfied with life.

An independent sample T-Test found that there was a significant difference of means in terms of Satisfaction with Life Scale (see Table 5) between Yoga/Activity group and Activity group (Mean Difference = 4.77, $p= 0.00$), and Yoga/Activity group and No Yoga or Activity
group (None; Mean Difference = 6.41, p= 0.00) at α=0.05. Thus the null hypothesis could be rejected in both cases, and both mean differences were found to be significant.

Table 4: Mean comparison and independent sample T-tests between all groups on Emotion Suppression

<table>
<thead>
<tr>
<th>Variable</th>
<th>(I) Groups</th>
<th>(J) Groups</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotion</td>
<td>Yoga</td>
<td>Activity</td>
<td>-2.04**</td>
<td>1.23</td>
<td>0.10</td>
<td>-4.46</td>
<td>0.39</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yoga</td>
<td>None</td>
<td>-1.03</td>
<td>1.31</td>
<td>0.43</td>
<td>-3.61</td>
<td>1.55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yoga</td>
<td>Both</td>
<td>0.20</td>
<td>1.30</td>
<td>0.88</td>
<td>-2.37</td>
<td>2.77</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Yoga</td>
<td>2.04**</td>
<td>1.23</td>
<td>0.10</td>
<td>-0.39</td>
<td>4.46</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Nothing</td>
<td>1.01</td>
<td>1.09</td>
<td>0.36</td>
<td>-1.15</td>
<td>3.17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Both</td>
<td>2.23*</td>
<td>1.09</td>
<td>0.04</td>
<td>0.09</td>
<td>4.38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Yoga</td>
<td>1.03</td>
<td>1.31</td>
<td>0.43</td>
<td>-1.55</td>
<td>3.61</td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Activity</td>
<td>-1.01</td>
<td>1.09</td>
<td>0.36</td>
<td>-3.17</td>
<td>1.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Both</td>
<td>1.23</td>
<td>1.18</td>
<td>0.30</td>
<td>-1.09</td>
<td>3.55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Yoga</td>
<td>-0.20</td>
<td>1.30</td>
<td>0.88</td>
<td>-2.77</td>
<td>2.37</td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Activity</td>
<td>-2.23*</td>
<td>1.09</td>
<td>0.04</td>
<td>-4.38</td>
<td>-0.09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
<td>-1.23</td>
<td>1.18</td>
<td>0.30</td>
<td>-3.55</td>
<td>1.09</td>
<td></td>
</tr>
</tbody>
</table>

* - The mean difference is significant at the 0.05 level.
** - The mean difference is significant at the 0.10 level.

Also, mean difference between Yoga group and No Yoga or Activity group (Mean Difference = 3.22, p= 0.07) was only significant at α=0.1. Thus the null hypothesis can only be rejected. However, mean difference between Yoga group and Activity group (Mean Difference = 1.58, p= 0.34) was not found significant, thus the null hypothesis could not be rejected.

People who do not practice yoga or engage in any other activity (No Yoga or Activity; x̅=28.2; SD (6.11); see Table 2) indicated to experience more perceived-stress that the rest of the groups,
while individuals practicing yoga along with other activity (Yoga/Activity) report to experience the lowest amount of perceived stress ($\bar{x}=26.92; SD (9.56))$.

Table 5: *Mean Comparison and Independent Samples T-tests between all groups on Satisfaction with Life Scale*

<table>
<thead>
<tr>
<th>Variable</th>
<th>(I) Groups</th>
<th>(J) Groups</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yoga Activity</td>
<td>1.58</td>
<td>1.64</td>
<td>0.34</td>
<td>-1.66</td>
<td>4.81</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>3.22**</td>
<td>1.74</td>
<td>0.07</td>
<td>-0.23</td>
<td>6.67</td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>-3.20**</td>
<td>1.74</td>
<td>0.07</td>
<td>-6.62</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>Activity Yoga None</td>
<td>-1.58</td>
<td>1.64</td>
<td>0.34</td>
<td>-4.81</td>
<td>1.66</td>
<td></td>
</tr>
<tr>
<td>Both Yoga</td>
<td>-4.77*</td>
<td>1.45</td>
<td>0.00</td>
<td>-7.63</td>
<td>-1.91</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>-3.22**</td>
<td>1.74</td>
<td>0.07</td>
<td>-6.67</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>Both Activity Yoga</td>
<td>-1.64</td>
<td>1.46</td>
<td>0.26</td>
<td>-1.24</td>
<td>4.53</td>
<td></td>
</tr>
<tr>
<td>None Activity</td>
<td>-6.41*</td>
<td>1.57</td>
<td>0.00</td>
<td>-9.51</td>
<td>-3.32</td>
<td></td>
</tr>
<tr>
<td>Both Both Yoga</td>
<td>3.20**</td>
<td>1.74</td>
<td>0.07</td>
<td>-0.23</td>
<td>6.62</td>
<td></td>
</tr>
<tr>
<td>None Activity</td>
<td>4.77*</td>
<td>1.45</td>
<td>0.00</td>
<td>1.91</td>
<td>7.63</td>
<td></td>
</tr>
<tr>
<td>Both None</td>
<td>6.41*</td>
<td>1.57</td>
<td>0.00</td>
<td>3.32</td>
<td>9.51</td>
<td></td>
</tr>
</tbody>
</table>

* - The mean difference is significant at the 0.05 level.
** - The mean difference is significant at the 0.10 level.

Although unexpectedly, the Independent Samples T-Test indicated that there were no significant mean differences between any groups in terms of Perceived-Stress Scale (see Table 6). Mean differences between Yoga/Activity group (Both) and Activity group (Mean Difference = -0.82, p= 0.65), and Yoga/Activity group (Both) and No Yoga or Activity (None) group (Mean Difference = -1.28, p= 0.51) were not found significant under any chosen $\alpha$ (0.05 or 0.10), thus the null hypothesis could not be rejected.
The Independent Samples T-test results were the same when analysing Yoga group. Mean differences between Yoga group and Activity group (Mean Difference = 0.4, p= 0.83), and Yoga group and No Yoga or Activity (None) group (Mean Difference = -0.02, p= 0.99) were not found significant under any chosen α (0.05 or 0.10), thus the null hypothesis could not be rejected.

Table 6: *Mean Comparison and Independent Sample T-tests between all groups on Perceived Stress Scale*

<table>
<thead>
<tr>
<th>Variable</th>
<th>(I) Groups</th>
<th>(J) Groups</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived-Stress Scale</td>
<td>Yoga</td>
<td>Activity</td>
<td>0.44</td>
<td>2.01</td>
<td>0.83</td>
<td>-3.54 to 4.41</td>
</tr>
<tr>
<td></td>
<td>Yoga</td>
<td>None</td>
<td>-0.02</td>
<td>2.14</td>
<td>0.99</td>
<td>-4.25 to 4.21</td>
</tr>
<tr>
<td></td>
<td>Yoga</td>
<td>Both</td>
<td>1.26</td>
<td>2.13</td>
<td>0.56</td>
<td>-2.95 to 5.47</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Yoga</td>
<td>-0.44</td>
<td>2.01</td>
<td>0.83</td>
<td>-4.41 to 3.54</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>None</td>
<td>-0.46</td>
<td>1.79</td>
<td>0.80</td>
<td>-4.00 to 3.08</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Both</td>
<td>0.82</td>
<td>1.78</td>
<td>0.65</td>
<td>-2.69 to 4.34</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Yoga</td>
<td>0.02</td>
<td>2.14</td>
<td>0.99</td>
<td>-4.21 to 4.25</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Activity</td>
<td>0.46</td>
<td>1.79</td>
<td>0.80</td>
<td>-3.08 to 4.00</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>Both</td>
<td>1.28</td>
<td>1.93</td>
<td>0.51</td>
<td>-2.53 to 5.09</td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td>Yoga</td>
<td>-1.26</td>
<td>2.13</td>
<td>0.56</td>
<td>-5.47 to 2.95</td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td>Activity</td>
<td>-0.82</td>
<td>1.78</td>
<td>0.65</td>
<td>-4.34 to 2.69</td>
</tr>
<tr>
<td></td>
<td>Both</td>
<td>None</td>
<td>-1.28</td>
<td>1.93</td>
<td>0.51</td>
<td>-5.09 to 2.53</td>
</tr>
</tbody>
</table>

* - The mean difference is significant at the 0.05 level.

** - The mean difference is significant at the 0.10 level.
Inferential Statistics

There will be 4 main dependent variables analyzed: satisfaction with life scale (SWLS), perceived stress scale (PSS), emotional regulation (ERQ) which incorporates 2 strategies of Cognitive Reappraisal and Emotion Suppression. Each of them will have same independent variables, including one describing respondents participation in yoga practices 'duration of yoga, 'frequency of yoga' and participation in other physical activities (sports and etc.) 'duration of activity' and 'frequency of activity'.

To determine the level, strength and direction of influence that independent variables have on certain dependant variables, certain statistical coefficients will be used such as Pearson's Coefficient of Correlation \((r = 1; \ r = -1; )\) and the interval and strength (Dancey & Reidy, 2011) will be interpreted according to the Table 7.

<table>
<thead>
<tr>
<th>Value of the Correlation Coefficient</th>
<th>Strength of the Correlation</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Perfect</td>
</tr>
<tr>
<td>0.8 - 0.9</td>
<td>Very Strong</td>
</tr>
<tr>
<td>0.5 - 0.8</td>
<td>Strong</td>
</tr>
<tr>
<td>0.3 - 0.5</td>
<td>Moderate</td>
</tr>
<tr>
<td>0.1 - 0.3</td>
<td>Modest</td>
</tr>
<tr>
<td>&gt; 0.1</td>
<td>Weak</td>
</tr>
<tr>
<td>0</td>
<td>Zero</td>
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Confidence intervals and p-value test will be used to determine the reliability and significance of Pearson's correlations. The chosen level of significance is \(\alpha = 0.05\).
Satisfaction with Life Scale (SWLS)

It is hypothesized that the yoga practice variables (i.e. duration and frequency of yoga) will positively correlate with SWLS. Table 8 shows Pearson's Correlations between SWLS (dependant variable) and other independent variables such as duration and frequency of activity.

Table 8: Pearson's Correlations between SWLS and Independent Variables

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</thead>
<tbody>
<tr>
<td>6. Duration of Yoga</td>
<td>0.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Frequency of Yoga</td>
<td>0.27</td>
<td>0.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Duration of Activity</td>
<td>0.18</td>
<td>0.03</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Frequency of Activity</td>
<td>0.20</td>
<td>-0.22</td>
<td>0.03</td>
<td>0.32</td>
<td></td>
</tr>
</tbody>
</table>

According to predetermined correlation strength table, all correlations were not strong, and only qualify as a 'Modest'. It is evident that the strongest correlations in this case were between SWLS and yoga variables, suggesting that yoga 'duration of yoga' and 'frequency of yoga' variables have the strongest influence on SWLS, and the direction of influence is positive (as hypothesised), indicating that SWLS increases when duration and frequency of yoga practice increases.

To determine the significance of Pearson's correlations 1-tailed T-tests will be performed, and values (p) compared to the chosen level of significance $\alpha=0.05$. $H_0$ Hypothesis refers to a general or default position: that there is no relationship between two measured phenomena. If $p < \alpha$, then $H_0$ will be rejected; if $p > \alpha$, then fail to reject $H_0$. As it can be seen in the Table 9 all of
the correlations p-values were smaller than chosen \( \alpha \), that means they are significant and reliable to use.

Table 9: *Pearson's Correlations 1-tailed T-tests between SWLS and Independent Variables*

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</thead>
<tbody>
<tr>
<td>6. Duration of Yoga</td>
<td>0.00</td>
<td>((&lt;0.05))</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>7. Frequency of Yoga</td>
<td>0.00</td>
<td>((&lt;0.05))</td>
<td>0.00</td>
<td>0.33</td>
<td>0.16</td>
</tr>
<tr>
<td>10. Duration of Activity</td>
<td>0.01</td>
<td>((&lt;0.05))</td>
<td>0.00</td>
<td>0.37</td>
<td>0.00</td>
</tr>
<tr>
<td>11. Frequency of Activity</td>
<td>0.00</td>
<td>((&lt;0.05))</td>
<td>0.37</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

In conclusion, it can be stated that the yoga practice variables strongly and positively correlate with SWLS, thus it indicates that the more the longer and more frequent yoga practice the higher satisfaction with life.

*Cognitive Reappraisal*

It is hypothesized that yoga variables (i.e. duration and frequency of yoga practice) will positively correlate with Cognitive Reappraisal. There were moderate Pearson's correlations found between Cognitive Reappraisal and independent variables displayed in Table 10. It is evident that the strongest correlations were found between independent yoga variables and Cognitive Reappraisal. The duration of yoga has scored a correlation of \( r=0.23 \), while frequency of yoga has the strongest correlation among all independent variables (\( r=0.25 \)). Both correlations
of yoga variables were positive, indicating that the use of Cognitive Reappraisal increases as the
duration and frequency of yoga practice increases.

Table 10: *Pearson’s Correlations between Cognitive Reappraisal and Independent Variables*

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<tbody>
<tr>
<td>6. Duration of Yoga</td>
<td>0.23</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Frequency of Yoga</td>
<td>0.25 0.59</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Duration of Activity</td>
<td>0.14 0.03 0.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Frequency of Activity</td>
<td>0.07 -0.22 0.03 0.32</td>
<td></td>
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</tbody>
</table>

Consequently, in order to determine the significance of Pearson’s correlations 1-tailed T-tests will be performed. The p values of 1-tailed T-test and comparison to chosen α (α=0.05) specified in Table 11.

It is evident that all correlations were found to be significant, excluding the correlation between Cognitive Reappraisal and frequency of activity. The p values of yoga variables were found to have p=0.00, thus rejecting the null hypothesis and supporting the claim of significance of their correlations.
It is hypothesized that the yoga practice variables (i.e. duration and frequency of yoga practice) will negatively correlate with Emotion Suppression. There were weak to none Pearson's correlations of Emotion Suppression with all independent variables (see Table 12).

Although the direction of dependency between yoga variables and Emotion Suppression was negative as predicted, it can not be said that any noticeable correlation exist. The duration of yoga variable scored the correlation of $r=-0.02$, while frequency of yoga had the correlation of $r=-0.08$. 

Table 11: **Pearson’s Correlations 1-tailed T-tests between Cognitive Reappraisal and Independent Variables**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>6. Duration of Yoga</td>
<td>0.00 ($&lt;0.05$)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00 ($&gt;0.05$)</td>
</tr>
<tr>
<td>7. Frequency of Yoga</td>
<td>0.00 ($&lt;0.05$)</td>
<td>0.00</td>
<td>0.33</td>
<td>0.37</td>
</tr>
<tr>
<td>10. Duration of Activity</td>
<td>0.04 ($&lt;0.05$)</td>
<td>0.33</td>
<td>0.16</td>
<td>0.00 ($&gt;0.05$)</td>
</tr>
<tr>
<td>11. Frequency of Activity</td>
<td>0.20 ($&gt;0.05$)</td>
<td>0.00</td>
<td>0.37</td>
<td>0.00 ($&gt;0.05$)</td>
</tr>
</tbody>
</table>
The significance of correlations between Emotion Suppression and independent variables are presented in Table 13. The p values of 1-tailed T-test and comparison to chosen $\alpha$ ($\alpha=0.05$) had shown that not a single variable had p value lower than $\alpha$ (0.05), thus failing to reject the null hypothesis. So the weak predetermined coefficients of correlation (see Table 12) were also found to be insignificant.
Perceived-Stress Scale (PSS-14)

It is hypothesized that the yoga practice variables (i.e. duration and frequency of yoga practice) will negatively correlate with PSS-14. There were weak to none Pearson’s correlations of PSS with all independent variables (see Table 14). Although the direction of dependency between yoga variables and PSS was negative as predicted, it can not be said that any noticeable correlation exist. Only the duration of yoga scored nearly moderate correlation of r=-0.12, while the frequency of yoga had a weak correlation of r=-0.03.

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<tbody>
<tr>
<td>6. Duration of Yoga</td>
<td>-0.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Frequency of Yoga</td>
<td>-0.03</td>
<td>0.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Duration of Activity</td>
<td>-0.06</td>
<td>0.03</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>11. Frequency of Activity</td>
<td>0.08</td>
<td>-0.22</td>
<td>0.03</td>
<td>0.32</td>
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</tbody>
</table>

The significance of correlations between PSS and independent variables are indicated in Table 15. The p values of 1-tailed T-test and comparison to chosen α (α=0.05) had shown that not a single variable had p value lower than α (0.05), thus failing to reject the null hypothesis. Furthermore, the moderate correlation between duration of yoga and PSS, did not qualify as significant, the exact value of p was 0.057, which is still higher than α=0.05.
Table 15: *Pearson’s Correlations 1-tailed T-tests between PSS and Independent Variables*

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<tbody>
<tr>
<td>6. Duration of Yoga</td>
<td><strong>0.06</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(&gt;0.05)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>7. Frequency of Yoga</td>
<td><strong>0.35</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(&gt;0.05)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Duration of Activity</td>
<td><strong>0.22</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(&gt;0.05)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Frequency of Activity</td>
<td><strong>0.17</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(&gt;0.05)</td>
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</table>
Discussion

The present study evaluated the effects of yoga-based practices on emotion regulation, perceived-stress and life satisfaction in Adulthood. It was expected that yoga practitioners will score higher on Cognitive Reappraisal and Satisfaction with Life Scale; and score lower on Emotion Suppression and Perceived-Stress Scale. The study findings are presented in this section.

The 1st hypothesis predicted that people who practice yoga will have significantly higher scores on the Cognitive Reappraisal compared to people who do not practice yoga. The results have shown that the means of Cognitive Reappraisal were highest in groups that practiced yoga, with lower scores in groups without yoga practice. The mean differences between yoga group and yoga/activity group were found to be significantly higher than activity group and no yoga or activity group. Thus it supports the hypothesis that people who practice yoga will have significantly higher scores on the Cognitive Reappraisal compared to people who do not practice yoga.

In support to the 1st hypothesis the 8th hypothesis was tested as well. The 8th hypothesis predicted that yoga practice variables (i.e. duration and frequency of yoga practice) will positively correlate with Cognitive Reappraisal. The results had shown that the strongest positive correlations were found between Cognitive Reappraisal and Yoga activity variables, thus supporting the hypothesis. The results have also shown that the length and frequency of yoga practice had the strongest correlation scores. Although the causation can not be interpreted solely by analyzing coefficients of correlation, it can be predicted that the longer and more frequently
one practices yoga, the better chances are of developing positive aspects of Cognitive Reappraisal.

As Cognitive Reappraisal is a positive aspect of Emotional intelligence, these findings are supported by previous research that yoga-based practices positively correlate with Cognitive Reappraisal (Gootjes et al., 2011). Furthermore, it has a positive relationship to emotional intelligence and subjective well-being (Rathore & Choudhary, 2013); as well as a better ability to control emotional interference during a cognitive task (Froeliger et al, 2012). Thus it is possible to draw a conclusion that people who practice yoga tend to experience and express greater positive emotion and lesser negative emotion with better interpersonal functioning (Gross &John, 2003). However the previous studies focused on broad spectre of emotional functioning, whereas the present study focused specifically on Cognitive Reappraisal as one of emotion regulation strategy.

The 3rd hypothesis predicted that people who practice yoga will have significantly higher scores on Satisfaction with Life Scale (SWLS) than people who do not practice yoga. The results have shown that the means of SWLS were highest among individuals who practice yoga and engage in other activity, while individuals who are not practicing yoga or any other activity scored lowest. The mean differences between yoga and yoga/activity groups were found to be significantly higher than activity or no yoga or activity groups. Thus, the results support the hypothesis and indicate that people who practice yoga are more satisfied with life than people who do not practice yoga.

The 5th hypothesis is also related to Satisfaction with Life Scale, as it predicts that yoga practice variables (i.e. duration and frequency of yoga practice) will positively correlate with
SWLS. The results had shown that the positive correlations were found between SWLS and Yoga activity variables, thus indicating the direct relation between variables and supporting the hypothesis. The yoga variables (length and frequency of yoga practice) also had the strongest correlation scores, indicating that in this study they had the strongest relations with SWLS.

The findings are also consistent with previous research showing that yoga practices improve satisfaction with life in terms of quality of life by reducing stress (Chung et al., 2012) and enhancing psychological, social and environmental aspects (Rakshani et al., 2010). However, these studies focus on limited samples of individuals who suffer from some type of illness (Bidwell et al., 2012) rather than on general population; thus the present study is important by revealing the effects of yoga on healthy subjects and their relationship to satisfaction with life.

The 2nd hypothesis predicted that people who practice yoga will have significantly lower scores on the Emotion Suppression compared to people who do not practice yoga. The results have shown that the means of Emotion Suppression were the lowest among groups that practiced yoga, with higher scores in groups without yoga. The only significant mean differences in terms of Emotion Suppression were found between yoga group and activity group, and yoga/activity group and activity group. Thus, these findings support the hypothesis only to some extent. Surprisingly, there were no significant differences found between yoga and yoga/activity groups and no yoga or activity group.

Emotion Suppression variable also showed weak to none Pearson's correlations with all independent variables (including ones describing yoga practice). Although the 7th hypothesis predicted correctly, that yoga practice variables (i.e. duration and frequency of yoga practice)
will negatively correlate with Emotional Suppression, the T-test had shown that correlations were not significant. Therefore the 7th hypothesis cannot be confirmed.

There is a lack of previous studies on Emotion Suppression as one of emotion regulation strategy thus the present study contributes to research area. In addition, Gross & John (2003) noted that emotion suppression refers to the experience and expression of lesser positive emotion and greater negative emotion with poorer interpersonal functioning. And as most of the research indicated that yoga practices positively influences individual's psychological functioning (Birdee et al., 2008) it would be consistent that yoga practitioners would use emotion suppression less than people who do not practice, nonetheless, the results are inconclusive.

The 4th hypothesis predicted that people who practice yoga will have significantly lower scores on Perceived-Stress Scale (PSS-14) than people who do not practice yoga. The results have shown that people who do not practice yoga and not engaged in any other activity indicated to experience more perceived-stress that the rest of the groups, while individuals practicing yoga along with other activity reported to experience the lowest amount of perceived stress. However the Independent Samples T-Test indicated that there were no significant mean differences between any groups in terms of perceived-stress. Thus the results do not support the hypothesis, indicating that there are no significant differences of perceived stress means between yoga practitioners and other groups.

The 6th hypothesis was created in order to support 4th hypothesis. The 6th hypothesis predicted that yoga practice variables (i.e. duration and frequency of yoga practice) will negatively correlate with PSS-14. Although the direction of correlation between yoga variables and PSS was negative as predicted, it cannot be said that any noticeable correlation exist. The
significance of correlations was also not found, thus the results of correlation cannot be interpreted and the hypothesis cannot be confirmed.

The findings of previous research studies revealed a positive impact of yoga by reducing the negative effects of stress (Mohan et al., 2011) and maintaining psychological and physical well-being (Michalsen et al., 2012) in terms of improving mood and lowering anxiety (Streeter et al., 2010). The strong negative correlations in previous studies might be due to limitations, because they have focused mainly on subjects with various ailments such as schizophrenia (Gangadhar & Varambally, 2011) and cancer (Carlson et al., 2001) that would cause a considerable amount of stress.

Limitations and Future Directions

The positive relationship was found between yoga practices and Satisfaction with Life Scale and Cognitive Reappraisal; these findings were supported by previous studies. However it was difficult to find significant relations between yoga practices and Emotion Suppression and Perceived Stress. Moreover it is important to consider that the results might be slightly inaccurate, because people can be engaged in number of other activities that influence their Satisfaction with Life or Cognitive Reappraisal and etc.

Furthermore, correlations between dependant and independent variables were not that strong as initially expected, most of the correlations only qualified as modest, while in some cases correlations were weak or nonexistent. This can be explained by the small scale of the study. Only 161 respondents were recruited, so there was limited data available for analysis: the data points may seem to be chaotically scattered and cannot be easily interpreted, also the
Pearson Correlation only restricts to linear correlations, while there might be other non-linear dependencies (quadratic, exponential, ecliptic etc.). We also have to take into account that correlation of 0.3 may be very low if one is verifying a physical law using high-quality instruments, but may be regarded as normal in the social sciences where there may be a greater contribution from complicating factors (Christensen et al., 2007).

It is also important to note that dependent variables analyzed in the present study might be influenced by many other factors, not only yoga practice or sports. For example Satisfation with life, for some people might be more influenced by good social interactions, quality of life or even financial situation - so people who do not practice yoga might have high scores on SWLS as well.

The present study selected a sample of 161 respondents which may not be a representative of a general public, thus in replication of this study the future research should aim for much higher number of respondents to discover more accurate findings.

Further research is also necessary, as this study mainly focused on mean comparison, correlation and direction of relation between yoga and dependent variables, it would be really interesting to involve more variables, and try to determine the strength and level of influence yoga has on individuals satisfaction with life or cognitive reappraisal or other quality of life variables.

Research literature has focused on different yoga types and their impact on individuals' health separately such as meditation (Kristeller & Hallett, 1999), hatha (Yoshihara et al., 2011) and mantra (Bormann & Carrico, 2009) etc., thus it would be important compare different types of yoga and their impact on particular variables such as perceived-stress. Also Emotion Suppression should be included among variables as there is no consistent literature revealing
whether yoga practice affects the use of this emotion regulation strategy. The findings would help to assign different types of yoga to particular therapies as efficient way to help people with different ailments.

Furthermore, more independent variables should be explored in addition to yoga variables, such as success in life (e.g. work, money) in addition to understand the part that yoga plays in more realistic every day model.

As Gross & John (2003) indicated that there is a difference between male and female in their emotion regulation strategies, it would be interesting to explore if yoga practices would have a positive impact on gender differences.

The findings indicated a strong positive relationship between yoga practice and Satisfaction of Life and Cognitive Reappraisal. As explored in previous literature, stress and anxiety causes an increase in negative emotions (Gross & John, 2003) and reduction of quality of life (Diener et al. 1985) and in turn contributes to development of various illnesses (Michalsen et al., 2012). Thus, considering these variables, yoga practices should be more promoted in terms of having therapeutic effects in order to develop effective schemes, which would support individuals in regulating emotions, managing mental stress, increasing positive attitudes towards life, promoting healthy lifestyle and therefore reducing the risk of developing physical or psychological disorders.
References


Appendices

Appendix A (refer to the Participants section of the Methods)

Written Consent

On Thursday, 24 October 2013, 16:10:11, Mayesvara das wrote:
To whom it may concern.
We welcome Rita Kalinauskaite to distribute questionnaire forms for her thesis at the Iskcon Kirtan Center and Govinda's Vegetarian Restaurant.
Y.S Mayesvara dasa

On Friday, 25 October 2013, 20:33:01, teresa murphy-moore wrote:
Hi Rita,
You can do your study with yoga sacred space for your thesis.
namaste
Teresa

http://yogasacredspace.com

Appendix B (refer to Materials section of the Methods)

Cover Sheet of the Questionnaire

This questionnaire will ask you if you practice any types of activities (i.e. yoga, sports, dancing etc). Also you will be asked about different aspects of your life, including feelings and thoughts, emotions and how you feel about your life in general at the moment.

Your participation in this research is optional and you have the right to stop at any time. Your anonymity will be protected. This means that your answers will not be shared with anyone and your name will not appear in any publication. For this reason, it will not be possible to withdraw from participation after the questionnaire has been completed.

There will be a number of open questions which require you to provide your own answers. Many of the questions will allow you to indicate the frequency with which you have experienced different feelings in relation to a particular issue - For example, question 14 requires you to respond using a scale ranging from '0' (never) to 4 (very often). In this case you should circle the
most appropriate answer to you from a list of possible answers. In other cases, such as question 12, you will be asked to provide a rating (or score) so as to indicate your feelings of intensity on a particular issue. Detailed instructions for each question will be provided in each section of the questionnaire.

If there is anything that you are not sure about, please feel free to contact the researcher at

While the survey asks some questions that might cause some minor negative feelings, the measures have been used in research. If any of the questions do raise difficult feelings for you, contact information for support services are included on the final page.

This questionnaire should take approximately 12 minutes.

Thank you for your participation.

Researcher: Rita Kalinauskaite
Supervisor: Lucie Corcoran

Appendix C (refer to Materials section of the Methods)

Demographic Questionnaire

Some Information about You

Please circle your answer or where appropriate write your answer in the space provided.

1. What is your nationality?
   • Irish
   • If you are from different country please specify bellow

2. What is your gender?
   • Female     • Male

3. What is your age? Please specify below

4. Do you practice any type of yoga?
• Yes  • No
(if no, skip to Q8)

5. **What type of yoga do you practice?**
   • Hatha (physical postures)
   • Meditation yoga (e.g. japa)
   • Mantra yoga (chanting)
   • Yoga Nidra (relaxation techniques)
   • Other, Please specify _________________

6. **How long have you practiced?** Please specify below _________________

7. **If yes, how often do you practice?**
   • Less than once a week
   • Once a week
   • Twice a week
   • Almost everyday
   • Everyday

8. **Do you perform any other activities/ sports (such as running, football, dancing etc)?**
   • Yes  • No

9. **If yes, indicate the most suitable intensity of activity (you may circle more than one answer if appropriate):**
   • Very relaxing
   • Moderately relaxing
   • Mentally active
   • Physically active
   • Physically demanding

10. **How long have you been participating in the activity/sport?**
    Please specify in months/years _________________

11. **How often do you practice this activity/sport?**
    • Less than once a week
    • Once a week
    • Twice a week
Appendix D (refer to Materials section of the Methods)

Satisfaction with Life Scale and Scoring (Diener et al., 1985)

12. Instructions.

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

1. ____ In most ways my life is close to my ideal.

2. ____ The conditions of my life are excellent.

3. ____ I am satisfied with my life.

4. ____ So far I have gotten the important things I want in life.

5. ____ If I could live my life over, I would change almost nothing.
Scoring

Though scoring should be kept continuous (sum up scores on each item), here are some cutoffs to be used as benchmarks.

- 31 - 35 Extremely satisfied
- 26 - 30 Satisfied
- 21 - 25 Slightly satisfied
- 20 Neutral
- 15 - 19 Slightly dissatisfied
- 10 - 14 Dissatisfied
- 5 - 9 Extremely dissatisfied

Appendix E (refer to Materials section of the Methods)

Emotional Regulation Questionnaire and Coding (Gross & John, 2013)

13. Instructions.

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

1-----------------2-----------------3------------------4------------------5------------------6------------------7
strongly disagree neutral strongly agree
1. ____ When I want to feel more positive emotion (such as joy or amusement), I change what I’m thinking about.
2. ____ I keep my emotions to myself.
3. ____ When I want to feel less negative emotion (such as sadness or anger), I change what I’m thinking about.
4. ____ When I am feeling positive emotions, I am careful not to express them.
5. ____ When I’m faced with a stressful situation, I make myself think about it in a way that helps me stay calm.
6. ____ I control my emotions by not expressing them.
7. ____ When I want to feel more positive emotion, I change the way I’m thinking about the situation.
8. ____ I control my emotions by changing the way I think about the situation I’m in.
9. ____ When I am feeling negative emotions, I make sure not to express them.
10. ____ When I want to feel less negative emotion, I change the way I’m thinking about the situation.

Note

Appendix F (refer to Materials section of the Methods)

Copy of Perceived Stress Scale (14 items) and Scoring (Cohen et al., 1983)

14. Instructions:

The questions in this scale ask you about your feelings and thoughts during THE LAST MONTH. In each case, you will be asked to indicate your response by placing an “X” over the circle representing HOW OFTEN you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don’t try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.
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 dealt successfully with day to day problems and annoyances?

5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?

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

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

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

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

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

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

12. In the last month, how often have you found yourself thinking about things that you have to accomplish?

13. In the last month, how often have you been able to control the way you spend your time?
14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

**Scoring**

PSS-14 scores are obtained by reversing the scores on the seven positive items, e.g., 0=4, 1=3, 2=2, etc., and then summing across all 14 items. Items 4, 5, 6, 7, 9, 10, and 13 are the positively stated items.

*Appendix G.* (refer to the Participants section of the Methods)

**Contact details for support services**

Many thanks for responding to the research. Should you feel that you need support, please find below:

[http://www.yourmentalhealth.ie](http://www.yourmentalhealth.ie)

Samaritans Helpline: 1850 60 90 90