

Revitalizing Personal Resources: A study on organizational stress management
through the implementation of yoga in the workplace.

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Declaration:

I hereby declare that the Research Report submitted for the Bachelor of Arts Honours in Psychology degree to The Independent Institute of Education is my own work and has not previously been submitted to another University or Higher Education Institution for degree purposes.

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Abstract

Stress is an inescapable component of our daily lives and presents significant risks to people in both their personal and professional lives. Within the context of work, negative stress can significantly harm organizational outcomes making it imperative for companies to effectively assist employees in stress management. This study aimed to assess whether the implementation of yoga, as a stress management intervention, would lead to a significant decrease in perceived stress amongst employees. Based on prior research indicating an association between yoga and stress levels in various international contexts, it was hypothesised that results would display a reduction in perceived stress with the implementation of the yoga intervention. Data was collected through the use of the Perceived Stress Scale Survey by Cohen as it is a reliable scientific measure (Cronbach's $\alpha = 0.78$) providing quantitative values of perceived stress, and data was analyzed using both a dependent and independent samples t-test for analysis. Findings of the study were inconclusive as although yoga was found to significantly reduce stress within the yoga group ($t = 4.04$, $p = 0.0004$), the overall decrease in comparison to the control group produced a non-statistically significant difference ($t = 0.96$, $p = 0.35$).

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Introduction: Context. Stress is an inescapable component of our daily lives and is increasing due to the changing nature of modern society. (Hussin, 2008; Magalhaes Das Never, Loots & van Niekerk, 2014; Sormaz & Tulgan, 2003; Thakur, 2016; Van Zyl, 2002). With the rise of globalization and increasing competition, people are under substantial pressure to continuously perform at a high standard, in both personal and profession spheres (Sormaz & Tulgan, 2003; Thakur, 2016). Studies have shown that low to moderate levels of stress over a short term can be beneficial to a person's performance, due to the activation of the *fight or flight* system, which increases productivity, stimulates creativity as well as positive competition (Magalhaes Das Never, Loots & van Niekerk, 2014; Sormaz & Tulgan, 2003; Thakur, 2016). However, extremely high levels or prolonged exposure to stress, even at a low to moderate levels, results in detrimental physiological and psychological effects to the body such as; stress-related illness in cardiovascular, gastrointestinal and circulatory health, behavioral regulation difficulties and mood disorders such as anxiety and depression (Babatunde, 2013; Coetzee & Rothmann, 2005; Hussin, 2008; Sharma, Chauhan & Khanna, 2012; Sormaz & Tulgan, 2003; Thakur, 2016).

Within the context of work, positive stress, which is short term in nature, causing physiological changes that can enhance employee performance, however, negative stress or distress can result in impaired job productivity, through higher levels of absenteeism, turnover, poor sleep quality and impaired concentration, which significantly impact organizational outcomes and increase expenses (Coetzee & Rothmann, 2005; Grawitch, Ballard & Erb, 2015; Hussin, 2008; Jones & Daigle, 2018; Pannu & Tikku, 2014; Sormaz & Tulgan, 2003; Thakur, 2016). According to Sharma (2011) and colleagues, stress is the biggest occupational hazard due to the associated costs which are on the rise. Within South Africa, a study by Van Zyl (2002) stated the country loses at an estimated 500,000,000 South African Rands (ZAR) per year due to stress-related illness, injury, and impaired job performance. Work by Magalhaes Das Never, Loots and van Niekerk (2014), found a substantial increase of this figure to an estimate company losses of 12,000,000,000 South African Rands per annum, indicating the growing impact of stress on employees in South Africa. (Sormaz & Tulgan, 2003).

Based on the overall detrimental impact of negative stress, both in one's personal and work life, stress management interventions (SMIs) are imperative for

the reduction of stress and management of these negative impacts (Babatunde, 2013; Grawitch, Ballard & Erb, 2015; Hussin, 2008; Jones & Daigle, 2018; Meuller, 2005; Van Zyl, 2002). According to Babatunde, (2013), SMIs are broadly defined as any purposeful action taken in an effort to ease or at least reduce the experience of stress by organizational employees, thus reducing the impact of the individuals, company and community as a whole. Although there are a range of traditional SMIs in the workplace, such as skills workshops, therapeutic intervention and educational talks, a relatively new method of SMI is the use of yoga within the workplace as a means to manage the physical experience of stress as well as employee health, wellness and sense of wellbeing (Axén & Follin, 2013; Hartfeild, et al., 2012; Hayes & Chase, 2010). Despite this method of SMI being relatively new in implementation, research has shown promising results of the benefits of this method of stress management, which shall be discussed in greater detail within the review of literature.

Rationale. There are a range of physiological, psychological and behavioral impacts of negative stress on individuals and within the context of the workplace, Hussin, (2008) summarizes the common findings in research referenced for the present study. The cumulative impacts of stress, if improperly managed leads to impaired functioning in the workplace thus negatively impacting the functioning of the organization (Hussin, 2008). As a result, it is vital for organizations to effectively assist stress management to ensure optimal performance of the company as a whole. As a result of the above mentioned increase in estimated losses due to negative stress in the South African workplace, it is imperative that firstly, stress management interventions are implemented, and secondly that the most effective interventions are utilized to reduce the detrimental impact of stress on the overall organization as well as the employees (Van Zyl, 2002).

In recent years, research has produced a sharp increase in international stress and stress management related articles, including the exploration of yoga as a stress management intervention, due to the associated physiological and psychological benefits such as reduced anxiety, increased concentration and reduced muscular tension, however, despite the evident need in South Africa, there exists a substantial gap in general stress management research within this context (Sharma, Chauhan & Khanna, 2012; Sormaz & Tulgan, 2003; Hussin, 2008; Reiley., et al, 2016; Thakur, 2016). Furthering this, although a significant portion of research

conducted on yoga for SMIs found yoga to be both effective and beneficial as SMIs, contrasting findings showing a lack of effectiveness of yoga for SMIs do exist causing a conflict of information relating to whether yoga is or is not effective. Therefore, the present study aimed to both contribute to the field of stress management research in South Africa as well as address the conflicting findings on the topic through examining the effects of a yoga intervention on perceived stress levels within the workplace.

Problem statement. Stress is an inevitable component which constitutes a part of everyday life and is experienced by all people at some point in their lives (Van Zyl, 2002). It can have a range of impacts on the body, which can be either positive or negative depending on the exposure period and severity (Babatunde, 2013; Grawitch, Ballard & Erb, 2015; Hussin, 2008). Within the context of work, stress can result in impaired job performance, thus impact organizational outcomes, and based on the estimated financial losses within South Africa as a result of stress related performance impairment, it suggests employees in South Africa do not have adequate methods for dealing with their stress (Grawitch, Ballard & Erb, 2015; Hussin, 2008; Jones & Daigle, 2018; Sormaz & Tulgan, 2003; Coetzee & Rothmann, 2005).

Research goal and research question. As a potential method for the management of such stress experienced by employees in South Africa, the present study aimed to establish whether yoga as a wellness intervention effectively assists in reducing levels of perceived stress in the workplace within the country's context. In order to assess this research goal, the study addressed the question: Does the implementation of yoga in the workplace lead to a significant decrease in perceived stress amongst employees?

Research Objectives. Based on prior research such as by Riley et al., (2016) Chong et al., (2011) Hartfield et al., (2012), Sharma, Chauchan and Khanna (2012) as well as Magalhaes Das Neves, Loots and van Nickerk (2014) which all indicate an association between yoga and stress levels in various international contexts, it was hypothesised that a negative relationship will exist displaying a reduction in perceived stress with the implementation of the yoga intervention. In order to effectively address the research question and general hypothesis, two hypotheses were formed and tested, H_1 : The yoga group will display a significant reduction in perceived stress, which was tested through examining the pre-intervention and post-

intervention Perceived Stress Scores of the group which received the yoga intervention during the study; and H₂: The yoga group will display a significantly greater reduction in perceived stress compared to the control group, which was tested through examining the reduction of Perceived Stress Scores of the yoga intervention (experimental) group and the non-intervention (control) group during the study.

Review of Literature.

To effectively locate the present study in the field of stress research, this section will explore theoretical foundations of the present study, provide a comprehensible definition of stress in the workplace amongst addition key concepts as well as explore findings from previous studies on stress management in the workplace.

Theoretical foundation. There are two key theories which serve to further the foundation of this study, first, Cox's (1978) Transactional Stress Theory and second, Grawitch, Barber and Justice's (2010) Personal Resource Allocation Model.

Transactional Stress Theory. Transactional stress theory was established by Cox in 1978 with a focus on the relationship between the work environment, the situational appraisal by the employee, the subsequent experience of stress, as well as the physiological, psychological and behavioral manifestations of the stress experience within the employee (Cox & Griffiths, 2010). This theory is of value to the present study as it provides valuable insight to the stress process within the workplace context. According to Cox and Griffiths, (2010) the stress process is ongoing and involves five key factors. First, the antecedent factors, the exposure to workplace stressors, including, job demands, role, development, and workplace relationships (Babatunde, 2013). As a result of exposure, the second factor of cognitive processes occur, as the employee appraises job demands, versus available coping resources, versus their relative ability to cope. This cognitive process gives rise to the experience of stress by the employee as a result of the interaction of the environmental stimuli with the described personal appraisal (Cox & Griffiths, 2010).

The stress experience is the third factor of the process; the manifestations of the emotional experience of stress on the body through physiological, psychological and behavioral changes in the employee. Such manifestations may be positive,

when the exposure to demands is of low to moderate levels of stress in a short period, which enhance personal functioning as a result of eustress, a positive energizing form of stress (Grawitch, Ballard & Erb, 2015; Hussin, 2008; Jones & Daigle, 2018; Sormaz & Tulgan, 2003). Alternatively, if the experience is of long term exposure or at a high level, the manifestations may negatively impact the employee through the fourth factor, the wider secondary effects on the employee which include; chronic health related problems, mood disorders and impaired behavioral regulation (Babatunde, 2013; Coetzee & Rothmann, 2005; Hussin, 2008; Sharma, Chauhan & Khanna, 2012; Sormaz & Tulgan, 2003; Thakur, 2016). Following in stress process is the final factor of feedback from the wider environment which relays the level of success of the individuals coping mechanisms in self-management of the incoming demands and appraisal process (Cox & Griffiths, 2010).

This theory of transactional stress is of significant relevance to the present study as it establishes the appropriate definition of stress. Based on this stress process theory, workplace stress is understood to arise from the relationship between job demands and job resources in the appraisal of personal stress levels. Although this model is criticized for increasing the difficulty of measuring stress, the appraisal process is of value for this study as it is the mechanism which produces perceived stress, a variable of measure in the present study selected for its ability to quantify stress despite individual differences (Cox & Griffiths, 2010; Taylor, 2015). Lastly, the stress process provides a framework for understanding the impact of stress in the outcomes of physiological, psychological, behavioral and health related outcomes as a result of personal coping attempts by the individual.

Personal Resource Allocation Model. The Personal Resource Allocation (PRA) Model to stress management by Grawitch, Barber and Justice (2010) locates workplace interventions in relation to their role in benefiting the employees through replenishing, replacing or providing the required coping resources to reduce the negative impact of stress (Grawitch, Ballard & Erb, 2015). According to the PRA model, individuals possess a range of resources such as time, energy and skills, which they allocate for performing tasks based on workplace demands. However, as they allocate these resources to tasks, fewer are left for existing demands, and as a result, when the demands exceed the available resources an imbalance manifests in the experience of stress, impacting employee wellbeing as previously discussed in the Transaction Stress Theory (Cox & Griffiths, 2010; Grawitch, Ballard & Erb, 2015).

In addition, there are some key characteristics of resources identified in the model which make individuals uniquely susceptible to stress (Grawitch, Ballard & Erb, 2015; Sormaz, Heidi, & Wenk, 2003). First is the subjective quantifiable value of the resources, meaning the value placed on a particular resource is unique to each employee (Grawitch, Ballard & Erb, 2015). The second characteristic is that some resources are infinite whilst others are finite and require replenishment, for example energy expended in the workplace is replenished through sleep, rest and nutrition (Grawitch, Ballard & Erb, 2015). Finally, the process of appraisal and allocation of the available resources is influenced by subjective individual factors, such as personality characteristics, making each employee unique in their allocation process (Grawitch, Ballard & Erb, 2015).

In further work by Grawitch, Ballard and Erb, the PRA is integrated with the three levels of workplace interventions; primary level, which address proactive risk management, such as evaluation and adjusting job roles, secondary level, which provide resources to identified at risk employees and tertiary level which support the chronically affected employees; to locate their role in personal stress resource management at either a personal, environmental or fit focus (2015). In sum, this model evaluation suggests a multilevel and multifocal approach to be the most effective stress management technique (Garwitch, Ballard & Erb, 2015).

For the present study, the above-mentioned characteristics are relevant as the described process of resource appraisal and allocation locates the role of personal resources in both personal and organizational stress management. Although a multilevel approach is suggested to be most effective for effective stress management, due to size, time and situational limitations on the present research study, only a single level & single focal intervention can be implemented. Despite this limitation, the model proved valuable in locating the present study intervention as a personal primary level intervention. The level is identified as primary as the yoga intervention provides general support to employees without identification of at risk or affected employees. Furthermore, the intervention has a personal focus through the potential of yoga to replenish an employee's personal energy resources and reduce stress, outcomes that will be examined in the review of previous studies.

A review of literature findings on yoga and stress management and conceptualization of key terms for the present study. For the purpose of this paper, a total of seventeen research papers were examined to review the previous

findings pertaining to; yoga and physiological stress reduction, the effect of yoga on perceived stress, yoga as a stress management intervention and lastly, yoga as a stress management intervention for perceived stress.

Stress. Although the word “stress” is used in common parlance, ambiguity surrounding the true definition of stress in research persists (Babatunde, 2013; Coetzee & Rothmann, 2005; Hussin, 2008; Sharma, 2014). Through examining literature for this paper, the conflict of definitions surrounds the specification of what stress is with the proposal of three main approaches to defining stress. First, the response-based approach, which identifies stress as the internal, physiological, psychological and behavioral manifestations in response to external stressor (Babatunde, 2013; Coetzee & Rothmann, 2005). The second approach, the stimulus approach, defines stress as the external environment or situation which causes an impact on the employee (Babatunde, 2013; Coetzee & Rothmann, 2005). The third account of stress is the interactional approach which defines stress as the interaction between the stimulus and internal appraisal processes to produce the physiological, psychological and behavioral changes in the employee (Babatunde, 2013; Coetzee & Rothmann, 2005). This interactional approach to defining stress shall be adopted for this study as it aligns with the Transactional Stress Theory of workplace stress.

Workplace stress. Workplace stress is conceptualized in the same manner as general stress, however, workplace stress is restricted in source as exclusively due to work related factors such as: the workplace environment, job demands, job resources, career development opportunities and work relationships (Babatunde, 2013; Deshpande, 2012; Thakur, 2016). Furthering this, studies have consistently shown individuals who suffer from workplace stress display the negative outcomes associated with general stress as well as additional symptoms such as: insomnia, weight fluctuations, hormonal disturbance, emotional instability and high blood pressure. (Coetzee & Rothmann, 2005; Deshpande, 2012; Riley & Park, 2013; Thakur, 2016). These symptoms have a significant negative impact on the organization through productivity losses, higher rates of illness, injury, absenteeism and turn-over (Coetzee & Rothmann, 2005; Deshpande, 2012; Riley & Park, 2013; Thakur, 2016).

Stress management. Stress management is defined as efforts directed towards the systematic reduction or elimination of stress within the workplace context and is vital for the effective organizational functioning (Babatunde, 2013;

Grawitch, Ballard & Erb, 2015; Jones & Daigle, 2018; Sormaz & Tulgan, 2003). Due to the related health and behavioral outcomes of stress, afore mentioned, the risk and costs incurred by the organizations are substantial and on the rise due to the changing nature of the workplace (Hussin, 2008; Magalhaes Das Never, Loots & van Niekerk, 2014; ; Sormaz & Tulgan, 2003; Thakur, 2016; Van Zyl, 2002). According to Grawitch, Ballard and Erb (2015), effective stress management must target an organization at three levels namely; primary level which address proactive risk management, secondary level which provide resources to identified at risk employees and tertiary level interventions which support the chronically affected employees.

Due to various time, size and situational constraints surrounding the Honors research project, the research project is unable to address all three levels, thus the study will address a primary level intervention. Despite this, findings of this project will still provide valuable contributions to insight on personal, primary level interventions for preventative stress management in the workplace (Babatunde, 2013).

Yoga. Yoga is a practice of physical movement, breath work and mindfulness aimed at promoting health and wellbeing through creating internal balance by integrating the mind and body (Axén & Follin, 2013; Hayes & Chase, 2010; Sharma, 2014; Thakur 2014). Yoga has been studied extensively in the past decade with promising results on stress reduction benefits, which shall be explored in detail through the review of literature. In the present study, the style of vinyasa yoga will be adopted - , as it is the specialty training of the researcher - as a stress management intervention for the participants in the experimental group over eight weeks.

The physiological and behavioral effects of yoga. Yoga is a practice aimed at promoting health and wellbeing through physical movement, breath work and mindfulness and has shown promising results in the process of stress reduction (Axén & Follin, 2013; Hayes & Chase, 2010; Sharma, 2014; Thakur 2014).

Physiologically, the effect of yoga on has shown to; significantly lower the levels of cortisol which is associated with decreased perceived stress, reduced anxiety and increased wellbeing, (Hewett et al, 2011; McCall, 2013; Riley & Park, 2013); reduce activity in the sympathetic nervous system causing improved regulation of the stress response (Agarwal, 2013; McCall, 2013); have a positive effects on the cardiac

health through reduced blood pressure and improved arterial functioning (Agarwal, 2013; McCall, year).

Based on these physiological effects of yoga on the body, an article by Hayes and Chase (2010) stated that the practice of yoga increases health, decreases stress and improves overall personal quality of life. The overall impact of yoga on health and wellbeing has been attributed to the benefits of yoga which extend beyond the physical and immediate benefit, explained by Sharma and colleagues (2012), as reducing poor health behaviors associate with stress such as smoking, alcohol consumption and poor dietary choice. These findings are supported by McCall (2013) as well as Hayes and Chase (2010) who attribute these constructive behavioral changes to positive food choices, improved sleep quality, reduced isolation as well as fosters positive physical and psychological responses to stress (Agarwal, 2013; Hayes & Chase, 2010; Hewett et al, 2011; McCall, 2013; Riley & Park, 2013).

Yoga and perceived stress. Psychologically, the effects of yoga practices have predominantly been negatively correlated to levels of perceived stress. In a review by Hayes and Chase (2010), a study is discussed which found a 31.57% decrease in perceived stress of healthy pregnant woman in the yoga group, while the control group recorded a 6.60% increase. Supporting these findings, in a review of yoga studies on stress by Chong et al. (2011), eight articles were examined with two articles displaying no effect and six displaying a negative correlation of yoga to stress. Of these six articles, four examined the effect of yoga and perceived stress, thus supporting the afore mentioned results by Hayes and Chase that yoga reduces perceived stress.

Despite these supportive findings, there are confounding results in which no changes in perceived stress levels are found after the implementation of a yoga intervention. These results were examined in a review by Sharma (2014), and within three of the nine relevant studies, no significant changes were observed in the perceived stress scores. Through examining these studies, it should be noted the average age of participants within the three studies was 12 years old, versus the average age of the other six studies, 41.72 year old, which displayed a significant reduction in stress (Sharma, 2014). Based in these findings, it suggests that yoga interventions for stress management are more effective for working adults than for children. This may be due to children having generally lower levels of life stresses in

comparison to a working adult. However, further study on this is recommended (Sharma, 2014). The average duration of the nine study interventions was 8.78 weeks, which informed the timeframe of the present study.

Yoga and stress management. From the context of stress reduction abilities of yoga practices, studies have emerged to examine the effectiveness of yoga in the industry of stress management practices. Sharma, Chauhan and Khanna, (2011), conducted an explorative study on the perceptions of yoga in the workplace. Key findings indicated; more than half of employees agree yoga helps with workplace stress management; employees felt yoga motivated improved efficacy at work because it energized staff, increased efficacy and assisted them in overcoming stress; yoga is perceived to be beneficial and easily implementable due to the low impact nature of the activity (Sharma, Chauhan & Khanna, 2011). These findings are of significance for the present study as they indicate the personal resource benefit of yoga through replenishing energy, as well as the positive reception to yoga in the workplace by employees.

In the field of work-related stress management, Cognitive Based Stress Management (CBSM), is stated by Hartfeil et al. (2012) to be the most popular and effective work-related stress management technique as an intervention. However, based in the stress management benefits of yoga, studies have progressed to examine Yoga Based Stress Management (YBSM), as a potential intervention technique. In this comparative category, Grannath et al. (2003) conducted a study comparing CBSM and YBSM in 2003 with results indicating no statistically significant difference between the effect of stress management between the two interventions. However, both groups displayed decrease in perceived stress, stress related behavior, anger, and exhaustion over time. Although results showed no statistically significant differences between the groups, the results do indicate an equitable effect of YBSM to CBSM.

In contrast to these early findings, later studies on stress management in the workplace indicated statistically significant differences between CBSM and YBSM with the yoga interventions proving more effective than the cognitive training in long term observation (Reiley., et al, 2016; Thakur, 2016). Thakur (2016) compared the effectiveness of the two interventions through a literature review and found them to be equally effective in stress management. However, YBSM displayed consistent additional benefits which contributed to the long-term wellbeing of employees

(Thakur, 2016). These results are supported by Reiley et al. (2016) who found equal stress reduction potential of both interventions, however observed that YBSM participants displayed the added long term benefits of increased non-yoga physical activity, improved quality of life and decreased secondary traumatic stress. Furthering this, an extensive literature review by Chong et al. (2011) concluded yoga to be as effective as other stress reduction techniques including CBSM. Therefore, based on these findings, adopting yoga as a stress management technique is a viable option for implementation in the workplace.

Yoga and perceived stress measures in the workplace. Work on studies which look at the effect of yoga on perceived stress within the workplace is limited with only two studies being found on this topic. First, by Hartfield and colleagues, (2012), which examined the effectiveness of yoga on reducing perceived stress and symptoms of back pain in the workplace. The yoga group recorded statistically significant reductions in perceived stress, back pain and improvements in psychological wellbeing in comparison to the control group. Based on these findings and prior discussed stress management research, the hypothesis of the present study is that perceived stress levels will reduce as a result of the intervention of yoga (Hartfield., et al, 2012).

The second study on this topic by Axén and Follin (2013) provided contrasting results with both the experimental and control group displaying improvements in perceived stress levels after a nine week intervention with no statistically significant difference between the two research groups in the post-test survey (Axén & Follin, 2013). It is uncertain as to the reason of the lack of statistically significant difference in this study, however, these findings add to the potential value of the present study. Based on these two papers, with conflicting results it is unclear whether the intervention of yoga in the workplace is effective in reducing perceived workplace stress, thus the present work aims to contribute to clarifying the existing findings.

Research Design and Methodology.

Paradigm: Functionalism. The present study is founded in the paradigm of Functionalism, which focuses on the systems of survival routed in the biological functionality of organisms and individuals. This is observed in the physiological effects of stress on the body causing a stimulation of the fight-or-flight system in a feedback loop. (Babatunde, 2013; Coetzee & Rothmann, 2005; Grawitch, Ballard &

Erb, 2015; Hussin, 2008; Sormaz & Tulgan, 2003). In addition, according to functionalism, organizations and societies may adjust around the individual to better optimize their performance, a characteristic of stress management efforts which reflect in the implementation of organizational interventions to assist employee performance in the workplace such as SMIs including skills workshops, therapeutic intervention and educational talks (Meuller, 2005; Jones & Daigle, 2018; Setar, Buitendach & Kanengoni, 2015). Based on these characteristics, functionalism is adequately suited to provide the foundational approach to the present research study on stress management in the workplace.

Research approach: Quantitative. This study will made use of a quantitative research approach to effectively assess whether yoga has an effect on the levels of perceived stress amongst employees in South Africa. The approach was selected as the topic aimed to address the effectiveness of a workplace intervention, which required both the implementation and assessment of the intervention effects on the employees. In doing so, the present study made use of deductive reasoning in applying similar methods in previous studies addressed in the literature review of this paper. Through an explorative research approach this study will made use of a cross-sectional, experimental design founded on both the transactional Stress Theory (Cox & Griffiths, 2010) and the Personal Resource Allocation Model (Grawitch, Ballard & Erb, 2015) as the theoretical foundation of the design.

Research population. The population for this research study was defined as: Individuals living in South Africa; working in any corporate company; aged between 24 and 39 years; able to read and write in English at a South African matriculant level; currently exercising between 1-4 hours a week; with access to a stable internet connection for the duration of the study; as well as a device to access study content online (smartphone/ computer/ laptop).

These parameters of the population were selected based on previous research findings and in order to align with the study aim. As the study aims to examine the effect of yoga on perceived stress in corporate environments, participants were required to be employed by an corporate company within South Africa, conducting any management, admin, or development style job, at any level within their company of employment. The population was further restricted to individuals between 24 to 39 years of age, as this was the average age bracket within previous studies reviewed (Sharma, 2014; Hartfield, et al, 2012; Hayes &

Chase, 2010; Chong et al, 2011). Additionally, participants exercised between 1 – 4 hours a week, to reduce the range of impact of exercise on stress as seen in the study by Magalhaes Das Neves and colleagues (2014). Lastly, due to the COVID-19 pandemic, the study was conducted via telecommunication thus requiring participants to have access to a stable internet connection for the duration of the study as well as access to a device to receive the study content online (smartphone/ computer/ laptop).

Research participants. The sample for this study were attained through a purposive sampling method of posting advertisements for research participants on social media platforms of Facebook, Instagram and WhatsApp. Purposive sampling was selected due to specific purpose and relevant criteria restrictions for the population of the research study. Participants were required to meet the above-mentioned criteria in order to reduce the effects of confounding variables, such as age, fitness level, and literacy on the results of the study. Prior to the recruitment process, the estimated required sample size was established to be 24 participants, 12 per group, based on recommendations from IIE Psychology Honors lecturers and supervisors for statistical analysis of findings, as well as based on an evaluation of the realistic scope of the research project as relatively small as it is an honors project. This size was additionally based off work in a research textbook by Maree and Pietersen (2020), which suggests a sample size of 15 participants per group for comparative research studies (2020).

Once ethical clearance was obtained from IIE Varsity College Cape Town, (Appendix B) the research participant advertisement (Appendix C) was posted on Facebook, Instagram and shared via WhatsApp the 30th of June 2020 for sign up before the 3rd of July 2020. Potential participants who responded to this advertisement via direct message to the researcher were required to confirm that they met the requirements of the study as well as provide the researcher with their Full name, Date of Birth and email address to be used in the study. On the 3rd of July 2020, all potential participants were sent the study eligibility and consent form email (Appendix D) which required them to provide written confirmation of their eligibility to participate as well as sign the attached consent forms (Appendix E). Participants who did not meet the criteria were thanked for their willingness to participate but were denied placement in the study. Through this method of purposive sampling, a total of 34 participants, all meeting the requirements of the study had been

successfully recruited and returned signed consent forms (Appendix E). These participants were randomly assigned participant numbers, and these numbers were entered into a google group creator, assigning participant numbers to either the experimental or the control group through random allocation. Despite this high number due to attrition of a total of 10 participants due to voluntary withdrawal from the study ($n = 3$), failure to return required questionnaires ($n = 3$) and failure to complete the minimum required 6 out of 8 yoga sessions ($n = 4$), the total participants at the end of the study was 24.

The final sample had 10 participants in the experimental (yoga) group, 5 of which were males and 5 were females, and 14 participants in the control (non-yoga) group with 4 males and 10 females. The average age of the total participants was 24-36 years with a standard deviation of 3.24 years (yoga group mean = 27.2, stdev = 3.6; non-yoga group mean = 27.1, stdev = 2.3). Additionally, all participants exercised within the required bracket of 1-4 hours, however participants in the non-yoga group reported slightly higher exercise habits of an average of more than 3 hours a week, compared to the average of 2 to 3 hours reported by the yoga group. All participants meet the remaining requirements of corporate job title, living and working in South Africa, internet connection and accessibility to a smart device. The described parameters of the final research participants have been summarized in table one below.

Research design. The present study made use of a quantitative research approach to effectively assess whether yoga has an effect on the levels of perceived stress amongst employees in South Africa. The approach was selected as the topic aims to address the effectiveness of a workplace intervention, which required both the implementation and assessment of the intervention effects on the employees. Through an explorative research approach the present study made use of an experimental design founded on both the transactional Stress Theory (Cox & Griffiths, 2010) and the Personal Resource Allocation Model (Grawitch, Ballard & Erb, 2015) as the theoretical foundation of the design. To ensure validity and reliability of this study the frameworks provided by previous intervention studies such as by Riley et al., (2016) Chong et al., (2011) Hartfield et al., (2012), as well as Sharma, Chauchan and Khanna (2012), have been adopted to inform the proposed study structure. For enhanced validity, the duration of the intervention was based off

the average intervention length of nine studies in a review by Sharma (2014) which was 8.78 weeks, thus informing the proposed 8 week timeframe of the present study.

Measuring instrument. The measurement instruments adopted in this study included the existing Perceived Stress Scale (PSS) as well as a short demographic questionnaire. According to Sharma (2014), the PSS is the most commonly used stress measure in experimental research?, particularly in the workplace as it provides an effective overview of stress levels amongst employees. The Perceived Stress Scale (Just use PSS, as you have already given the acronym) by Cohen and colleagues (Appendix I) is a fourteen item self-report measure with each question being answered on a Likert scale of 0 to 4 calculating to the participants total score which will fall between 0 (no Perceived stress and 56 (highest possible Perceived Stress) thus recording the perceptions of how stressful people appraise their life to be (Cohen, Kamarack & Mermelstein, 1983; Taylor, 2015). This measure was applied to the present study to measure observable differences in stress perceptions of participants through comparison of the pretest and posttest responses in this experiment. The benefit of using a PSS survey for this study is that it will provide quantitative data for analysis of the effectiveness of the yoga intervention on perceived stress reduction. Additionally, a demographic survey (Appendix J) shall provide insight to the environment surrounding participants, which will be used in the analysis and discussion of results surrounding the perceived stress levels of participants.

The PSS is an established scientific measure with strong reliability (Cronbach's $\alpha = 0.78$; Hewett, et al., 2011), and as such contributes positively to the validity of the present study. Additionally, the benefit of using the PSS questionnaire as the instrument of measure is that it will effectively provide insight into the levels of perceived stress of participants to effectively assess the research question: Does the implementation of yoga in the workplace lead to a significant decrease in perceived stress amongst employees? Based on prior research which all indicate a range of correlational scores between yoga and stress levels in various international contexts (Riley et al., 2016; Chong et al., 2011; Hartfield et al., 2012; Sharma, Chauchan and Khanna 2012), the results of the present study were expected to display a similar negative relationship between the implementation of yoga and participant PSS.

Data collection process. The present study was conducted over a total of eight weeks, from the 6th of July 2020 to the 30th August 2020. Due to the lockdown restrictions of COVID-19, this research study was conducted 100% online. After the signed consent forms were successfully returned via email, and the process of random allocation was completed, the research participants were sent an email that welcomed them to the research study, introduced to the research study website, and provided the required PSS and demographic questionnaires for completion in week one (Appendix I & Appendix J). Throughout the eight weeks of the study, all participants were required to complete two PSS and two demographic questionnaires, one of each in the first week and one of each in the final week of the research study. For those who were randomly allocated to the non-yoga group, they were instructed to continue with their lives 'as normal' and to take note of the weekly check in emails until week eight. In contrast, for those in the yoga group, in addition to the questionnaires, participants were required to complete one 45-60 minute prerecorded yoga session a week, provided by the researcher for the full eight weeks of the study, and were required to complete a minimum of six of the eight total sessions.

During week one, research participants were sent an email containing the PSS and demographic questionnaires for completion before the end of week one, as well as login details for the research study website. All forms in week one were successfully returned. For the full eight weeks of the study, research participants had password protected access to a personal profile on the study website where participants could access details about the study, watch a prerecorded welcome video detailing participant requirements of their appropriate group, contact the researcher via email, access a PDF version of their signed consent forms, and for the yoga group, access their weekly yoga session and submit an online yoga journal after each YouTube yoga class. Each of the Yoga sessions were prerecorded and uploaded as unlisted onto YouTube by 200 hour Yoga Teacher Training (YTT) certified yoga instructor and researcher of the present study. Each video was only made available in the relevant week, and once completed would indicate as complete and would no longer be available. During weeks two to eight of the study, 1 participant withdrew from the non-yoga group, an additional 2 yoga group participants withdrew from the study, and 4 of the research participants in the yoga

group failed to complete the minimum required six of eight yoga sessions, thus the data of these 8 participants had to be excluded from the research data analysis.

In week eight of the study, the second PSS and demographic questionnaires were sent out via email to be returned before the end of the week. All participants in the yoga group ($n = 10$) successfully returned their completed forms, however, in the non-yoga group ($n = 14$) only 14 out of the remaining 16 participants successfully returned their questionnaires, thus the outstanding 2 participants data had to be excluded from the data analysis. In an attempt to reduce the rate of attrition, research participants were contacted weekly via email by the researcher providing an update on what week of the study participants were in, as well as details on how many sessions they had to complete and details on the upcoming session for the week for those in the yoga group. A sample of these communications to the non-yoga group may be seen in Appendix G and to those in the yoga group may be seen in Appendix H.

Despite these efforts, the attrition rate of this study was high, having lost approximately 30% of the original recruited participants. According to Maree and Pietersen, there is an associated risk with the use of email administered surveys, despite the cost effective and convenient nature of electronic questionnaires (2010). In addition, due to the extensive length of the research study, a total of eight weeks, attrition was recognized to be a substantial risk prior to data collection commenced, therefore, for future studies with greater resources and fewer restrictions, a substantially larger sample size will be beneficial for reducing the attrition impact on future research validity.

Statistical analysis method. The statistical analysis method selected for the present study was a t-test, as this unit of analysis allows for statistical comparisons of the means of both the dependent groups of data examined in H_1 through a dependent samples t-test, as well as the two independent sets of data of H_2 in an independent samples t-test (Finchilescu & Nunez, 2019). In addition, the selection of a t-test for analysis was informed by the use in previous research including that by Riley et al., (2017), adopted a t-test for the analysis in comparison of two independent interventions to compare the effectiveness of Yoga based stress management to cognitive based stress management. Furthering this study, research by Hartfiel et al., (2012) which compared the PSS and back pain ratings of a yoga

and non-yoga group, similar to the present study, also made use of a t-test, amongst other tests, for the statistical analysis of the collected data.

For the use of a t-test on research data, the data needs to be parametric, normally distributed, independent, possess no significant outliers, and display homogeneity of variance (Finchilescu & Nunez, 2019). Therefore, prior to analysis, data was known to be interval in nature, was checked for homogeneity of variances through calculating the f-critical value, and was examined for normality using box and whisker plots (see graphs 1 and 2). The first hypothesis (the yoga group will display a significant reduction in perceived stress) was assessed for statistical significance through the application of a dependent sample repeat measures t-test. This was selected for the comparison of participants' PSS scores in week one to their PSS scores in week eight, to establish whether a statistically significant difference exists in PSS scores from participants within the yoga group. The formula applied for this t-test was:

$$t = \frac{\text{Mean of the difference of the scores}}{\left(\frac{\text{Standard deviation of difference scores}}{\sqrt{\text{number of difference scores}}} \right)}$$

Additionally, the second hypothesis (the yoga group will display a significantly greater reduction in perceived stress compared to the control group) was assessed for statistical significance through the application of an independent samples t-test. This was selected for the comparison of the difference scores between participants in the yoga and non-yoga groups to establish whether a statistically significant difference exists between the change in PSS scores of participants in the yoga and non-yoga groups. The formula applied for this t-test was:

$$t = \frac{\text{mean of the first sample} - \text{mean of the second sample}}{\sqrt{(\text{pooled variance} \times \left(\frac{1}{\text{number of participants in the first sample}} + \frac{1}{\text{number of participants scores in the second sample}} \right))}}$$

Statistical analysis application. In the application of the statistical formula above, both hypotheses tests were conducted with the use of Microsoft Excel. For the assessment of H₁ the participant scores of the yoga group were examined through calculating the required elements of the dependent samples t-test. This entailed calculating each yoga group participants PSS captured post-intervention which was subtracted from the calculated pre-intervention score to provide a score of the decrease in PSS of each participant. These decrease scores were then used to

calculate the groups average decrease in PSS with the excel 'average' formula, as well as the standard deviation of the groups decrease in PSS using the excel 'stdev' formula. These two values were applied to the dependent samples t-test formula provided above with the significance value (alpha) set at 0.05. Once the t-value was calculated, the probability (p-value) was calculated to assess whether the results were statistically significant using the excel 'T-DIST' formula.

For the assessment of H₂, the decrease in participant PSS of both the yoga group and non-yoga group were examined through calculating the required elements of the independent samples t-test. Just as in the assessment of H₁, this process required the calculation of each non-yoga group participants score of the decrease in PSS calculated through deducting the post-intervention PSS from the pre-intervention score. The decrease in Perceived stress scores of both groups were then tabulated and used to calculate the average decrease in PSS with the excel 'average' formula, the standard deviation of decrease in PSS using the excel 'stdev' formula as well as the variance of decrease in PSS of each groups participant decrease in PSS. These values were then applied to the independent samples t-test formula provided above with the significance value (alpha) set at 0.05. Using the excel 'T-DIST' formula, the probability (p-value) was calculated to assess whether the results were statistically significant. The outcomes of both of these calculations shall be discussed in the findings section of this report.

Findings

This study examined the effects of an 8-week, online yoga intervention on perceived stress levels of a sample consisting of a total of 24 participants, with 10 participants in the experimental (yoga) group, 5 of which were males and 5 were females, and 14 participants in the control (non-yoga) group with 4 males and 10 females. The age range of the total participants was between 24-36 years (yoga group 24-34 years; non-yoga group 24-36 years), and all participants lived and worked in South Africa, possessed a sufficient Matriculant level English literacy, and had access to a stable internet connection and a smart device. Throughout the research study, participants were required to provide data relating both to demographics and perceived stress of which the findings have been presented according to the findings on work, exercise habits and perceived stress scores.

Work. Demographic information was collected on the participants work to examine their hours and location of work (from home, in office, combination of home and office). All participants were employed in a corporate job role and worked an average of 41.56 hours per week ($mean = 10.79$), with the yoga group working slightly less hours per week ($mean = 40.50$, $sd = 6.43$) compared to the non-yoga group ($mean = 42.32$, $sd = 13.26$). Furthering this, regarding the location of work throughout the duration of the research study, a total of 11 individuals worked from home ($n_{yoga} = 7$; $n_{non-yoga} = 4$), 12 individuals worked both from home and in office ($n_{yoga} = 3$; $n_{non-yoga} = 9$), and only 1 participant, from the non-yoga group, worked in office.

Exercise. Additional demographic information was collected on the exercise habits of the study sample. For the duration of the study, all participants exercised between 1-4 hours per week, with the yoga group exercising a median of 2 to 3 hours per week and the non-yoga group exercising a median of more than 3 hours per week. Reports of the type of exercise conducted throughout the study were broadly categorized into yoga, cardiovascular exercise which included walking, running, cycling, hiking, skipping and HIIT, strength which included weights, weight training, Pilates and bodyweight training, as well as a mixed category which were activities both cardiovascular and strength related in nature which included surfing and Muay Thai. Within the yoga group, all 10 participants reported doing yoga, in addition 9 individuals reported partaking in a type of cardiovascular exercise, 2 participants reported doing strength related exercise and 1 participant reported doing mixed category exercise. In contrast, participants in the non-yoga group reported with 4 individuals doing yoga, all 14 participants doing a form of cardiovascular exercise, 10 participants doing a form of strength exercise and 3 participants doing mixed category exercise. The reported findings related to the sample demographics have been summarized in the table one presented on the following page.

Table 1

A summary of demographic findings of participants in the research study.

	Yoga Group (n = 10)	Non-yoga group (n = 14)
Gender		
<i>Male</i>	5	4
<i>Female</i>	5	12
mean age (sd)	27.20 (3.58)	27.60 (2.82)
<i>(table continued)</i>	Yoga Group (n = 10)	Non-yoga group (n = 14)
<i>Age range</i>	24-34	24-36
Work location during the study		
<i>From home</i>	7	4
<i>In office</i>	0	1
<i>Both home and office</i>	3	9
$\bar{x}$ work hours/ week (σ)	40.50 (6.43)	42.32 (13.26)
Exercise		
<i>Median hours of exercise/week</i>	2 to 3	3+
Type of exercise during the study		
<i>Yoga</i>	10	4
<i>Cardiovascular</i> ¹	9	14
<i>Strength</i> ²	2	10
Mixed ³	1	3

¹walking/ running/ cycling/ hiking/ skipping/ HIIT; ²weights/ weight training/ pilates/ bodyweight training; ³ surfing/ muay thai

Perceived stress. In addition to the demographic details collected during the study, information on perceived stress levels was collected from the participants in the first and eighth week of the study to assess the effectiveness of yoga as an intervention for perceived stress. Findings showed the Perceived Stress Scores (PSS) of both study groups displayed a decrease from week one to week eight of the study, whereby the 10 participants who received the yoga intervention (*mean* = 9.1,

$sd = 6.54$) demonstrated a greater decrease in perceived stress over the eight week period compared to the 14 participants in the control group ($mean = 6.43$, $sd = 6.81$), however these results were non-statistically significant, ($t = 0.96$, $p = 0.35$) observable in table 2A. Despite the lack of statistical significance in the decrease in PSS between groups, as seen in table 2B, the implementation of yoga was associated with a significant reduction in perceived stress as the 10 participants who received the yoga intervention for eight weeks displayed a statistically significant decrease in perceived stress ($t = 4.40$, $p = 0.0004$, from pre-intervention in week one ($mean = 29.2$, $sd = 7.06$) compared to the post-intervention in week eight ($mean = 20.1$, $sd = 5.97$) as seen in table 2C. These findings on decrease in PSS within and between groups may be observed in terms of the statistical distribution of the findings in figures 1 to 8 in the appendix section of this report.

Table 2A

A summary of perceived stress scores of the yoga and non-yoga groups.

	PSS (week 1)	PSS (week 8)	Decrease in PSS
Yoga group			
Mean (sd)	29.2 (7.07)	20.1 (5.97)	9.1 (6.54)
Non-yoga group			
Mean (sd)	29.4 (5.94)	22.9 (6.27)	6.4 (6.81)

Table 2B

A summary of the Perceived stress scores of the yoga group.

	PSS (week 1)	PSS (week 8)	t-value	p-value
Yoga group				
Mean (sd)	29.2 (7.07)	20.1 (5.97)	4.40	0.0004

Table 2C

A summary of the decrease in Perceived stress Scores, t-value and p-value of the yoga and non-yoga groups

	Yoga group (n = 10)	Non-yoga group (n = 14)	t-value	p-value
Mean (sd)	9.1 (6.54)	6.4 (6.81)	0.96	0.35

Discussion.

Interpretation of findings. This study examined the effects of an 8-week, online yoga intervention on perceived stress levels of a sample consisting of a total of 24 participants. The aim of this research study was to establish whether yoga as a wellness intervention effectively assists in reducing levels of perceived stress in the workplace within a South African context. The findings of this study supported the first hypothesis of the study, that participants in the yoga group displayed a significant reduction in perceived stress ($t = 4.40$, $p = 0.0004$), indicating a potential benefit of adopting yoga based stress management techniques within the context of South Africa. These findings are possibly accounted for by the Personal Resource Allocation Model which describes the finite nature of certain resources. As energy is expended through work hours, stress levels are predicted to rise due to a reduction of available resources for allocation by employees (Grawitch, Ballard & Erb, 2015). However, through the implementation of yoga with physiological benefits of increased energy, mood and focus, the energy spent by employees is thus better replenished allowing a more effective coping with incoming stressors as seen in the reduction in perceived stress within the yoga group.

It is however, vital to consider the demographic and contextual factors surrounding the participants in the study which lead to such findings. For the examination of this first hypothesis, the PSS of the yoga group were assessed for statistical significance through the application of a dependent sample repeat measures t-test. This was selected for the comparison of participants' PSS scores in week one to their PSS scores in week eight, to establish whether a statistically significant difference exists in PSS scores from participants within the yoga group.

The 10 participants within the yoga group were between the ages of 24-34 years, 5 participants were male, and 5 were female, and all participants worked a corporate job role for an average of 40.5 hours a week ($sd = 6.43$). Within this research group, 7 of the participants were White, 2 were Black and 1 was Indian, reducing the validity of applying these findings to the broader and more diverse context of South Africa. In addition, in examining the decrease in PSS amongst the yoga group participants, it should be noted that the 3 participants of color recorded the lowest reduction in PSS with the average decrease in PSS for the three participants of color being 2, compared to the average PSS decrease of the white participants being 12.14. According to Transactional Stress Theory, the stress experience is a manifestations of the emotional experience of stress on the body through physiological, psychological and behavioral changes in the employee which differs between individuals based on their perception of stress and available coping resources (Cox & Griffiths, 2010). Through applying this theory to the difference in score between racial groups, future exploration is required through research into the cross cultural applicability of such an intervention, as well as into additional contextual factors such as accessibility, income, social support which may be contributing to the stress levels of non-white communities in South Africa. Therefore, although these findings support the hypothesis, there is an awareness of the lower validity of these findings due to these discussed findings as well as resource limitations on this research project.

Despite the significance of the analysis within the yoga group, no statistically significant differences were found between groups ($t = 0.96$, $p = 0.35$), leading to the rejection of the second hypothesis that the yoga group would display a significantly greater reduction in perceived stress compared to the control group. As the null hypothesis is accepted, that there are no statistically significant differences in decreased PSS ($t = 0.96$, $p = 0.35$), between the 10 participants who received the yoga intervention ($mean = 9.1$, $sd = 6.54$) compared to the 14 participants in the control group ($mean = 6.43$, $sd = 6.81$). This lack of statistical significance between groups may be attributed to the effects of exercise on perceived stress shown in research by Magalhaes Das Neves and colleagues (2014), which found statistically significant reduction in PSS of participants whom participated in regular exercise. Not only did participants in the non-yoga group of the study exercised more ($mean = 3+$ hours/ week) than the yoga group ($mean = 2$ to 3 hours/ week), the non-yoga

group reported a greater variety in the types of exercise which they engaged in throughout the study, observable in table 3 below. Based on these findings and previous stress management and exercise research, this provides a potential explanation for the lack of statistically significant difference between the two research groups. These findings have been summarized in table three below:

Table 3

A summary of the decrease in PSS scores and exercise demographics in both the yoga and non-yoga group.

	Yoga Group (n = 10)	Non-yoga group (n = 14)	T score	P value
Decrease in PSS				
Mean (sd)	9.1 (6.54)	6.43 (6.81)	0.96	0.35
Exercise				
Median hours of exercise/ week	2 to 3	3+		
Types of exercise during the study				
Yoga	10	4		
Cardiovascular ¹	9	14		
Strength ²	2	10		
Mixed ³	1	3		

¹ walking/ running/ cycling/ hiking/ skipping/ HIIT

² weights/ weight training/ pilates/ bodyweight training

³ surfing/ muay thai

Findings in context. As a practice aimed at promoting health and wellbeing through physical movement, breath work and mindfulness, yoga has shown promising results as a method of stress reduction (Axén & Follin, 2013; Hayes & Chase, 2010; Sharma, 2014; Thakur 2014). Findings of this study partially support existing research in indicating that yoga was associated with significant reductions in PSS within the yoga group ($t = 4.40$, $p < 0.05$). The present study supports existing reviews by Chong and collages (2011), which reported four of six relevant studies finding a negative correlation between yoga and reductions of perceived stress.

Although the yoga group displayed statistically significant decrease in PSS, the comparison of the decrease in PSS between the yoga and non-yoga group indicated a difference however, these results were not statistically significant ($t = 0.96$, $p = 0.35$). Therefore, in contrast to previous research, such as by Hartfiel and colleagues, (2012), Hayes and Chase, (2010), and Sharma, (2014) which found yoga participants recorded statistically significant reductions in perceived stress, and improvements in psychological wellbeing in comparison to the control group, the present study found no significant intergroup differences. This lack of statistical significance between groups may be attributed to the above discussed effects of exercise on perceived stress as the control group reported a higher quantity of weekly exercise ($m = 3+$ hours) compared to the yoga group ($m = 2$ to 3 hours).

In addition, previous studies which indicated statistically significant differences between group, such as those reviewed by Sharma, (2014) consisted of yoga interventions conducted either in person weekly, or a combination of in person and prerecorded content to do at home by participants. In the present study however, due to the severity and measures enforced to address the Coronavirus, many employees have been required to work from home, thus the implementation of the yoga intervention was required to be completed exclusively online. Furthering this, previous studies which found significant between group differences, consisted of significantly larger sample sizes, such as that by Hewett and colleagues, (2011) which had 51 yoga participants, and Hartfiel and colleagues, (2012) which had 74 research participants.

Addressing the research question and objectives. Stress is an inevitable component which constitutes a part of everyday life and is experienced by all people at some point in their lives (Van Zyl, 2002). It can have a range of impacts on the body, which can be either positive or negative depending on the exposure period and severity (Babatunde, 2013; Grawitch, Ballard & Erb, 2015; Hussin, 2008). Within the context of work, stress can result in impaired job performance, thus impact organizational outcomes (Grawitch, Ballard & Erb, 2015; Hussin, 2008; Jones & Daigle, 2018; Sormaz & Tulgan, 2003; Coetzee & Rothmann, 2005). Based on the previous mentioned context, rationale and above discussed problem statement, the present study aimed to establish whether yoga as a wellness intervention effectively assists in reducing levels of perceived stress in the workplace within a South African context. In order to address the research aim, the present study intended to assess

the research question: Does the implementation of yoga in the workplace lead to a significant decrease in perceived stress amongst employees?

In order to answer this question, two hypotheses were tested: H_1 : The yoga group will display a significant reduction in perceived stress, and H_2 : The yoga group will display a significantly greater reduction in perceived stress compared to the control group. Findings indicate the implementation of yoga was associated with a significant reduction in perceived stress as the 10 participants who received the yoga intervention for eight weeks displayed a statistically significant decrease in perceived stress ($t = 4.40$, $p < 0.0004$), from pretest in week one ($mean = 29.2$, $sd = 7.06$) compared to the posttest in week eight ($mean = 20.1$, $sd = 5.97$) therefore H_1 alternate has been accepted. Furthering this, the 10 participants who received the yoga intervention ($mean = 9.1$, $sd = 6.54$) demonstrated a greater decrease in perceived stress over the eight week period compared to the 14 participants in the control group ($mean = 6.43$, $sd = 6.81$), however these results were non-statistically significant, ($t = 0.997$, $p = 0.35$). Based on these hypothesis findings, the final research results are inconclusive as although yoga has been found to significantly reduce stress within the yoga group, the overall decrease in comparison to the control group produced a non-statistically significant difference.

Considerations

Reliability and validity. To ensure validity and reliability of this study the frameworks provided by previous intervention studies such as by Riley et al., (2016) Chong et al., (2011) Hartfield et al., (2012), as well as Sharma, Chauchan and Khanna (2012), were adopted to inform the proposed study structure, methodology and analysis processes. One such factor which enhanced the validity of the present study was the duration of the intervention, which was based off the average intervention length of nine studies in a review by Sharma (2014) which was 8.78 weeks, thus informing the proposed 8 week timeframe of the present study. In addition to this, the use of the Perceives Stress Scale significantly increased the reliability of the study as it is an established scientific measure with strong reliability (Cronbach's $\alpha = 0.78$; Hewett, et al., 2011).

Despite these positive contributions to the overall validity and reliability of the study was negatively impacted by the electronic medium and extensive length of the study. According to Maree and Pietersen, there is an associated risk with the use of

email administered surveys, despite the cost effective and convenient nature of electronic questionnaires (2010). In addition, due to the extensive length of the research study, a total of eight weeks, attrition was recognized to be a substantial risk prior to data collection commenced. As a result of these factors, the present study experienced an attrition of 30% of the original recruited participants, thus negatively impacting the reliability due to a smaller sample size, as well as reducing the validity. Furthering this, as only 5 of the total 24 participants were people of color, the sample failed to accurately represent the diversity of South Africa, thus reducing the validity of applying these findings to the broader and more diverse context of South Africa.

Ethical considerations. There were no risks associated with the present study. Participants' identity and information provided was be saved on a password secure hard drive accessible only by the researcher. Furthering this, all recruited participants were required to sign an informed consent form (Appendix E) before commencing the study, as well as have the right to withdraw this consent and/ or themselves from the study at any point in the study. Lastly, to ensure fairness of access to the intervention, the control group participants were provided eight weeks of access to the yoga content after the final data collection.

Limitations. Prior to examining the anticipated contributions of this study, it is vital to draw attention to the major limitation which face this present study. It is important to note, according to Deshpande (2012), the changing nature of work has made the distinguishing of workplace stress from other life stress increasingly difficult, and as the world is currently in the midst of the 2020 Coronavirus pandemic, this differentiation is increasing difficulted as people are encouraged to work from home as a practice of social distancing. As a result of the severity and measures enforced to address the Coronavirus, many employees have been required to work from home, thus contributing to the difficulty in distinguishing general stress from work related stress, as work is conducted in the employees' home space.

The impact on the present study is that the measured perceived stress scores of participants may be impacted by the location of their work, occurring either in the workplace or at home. To account for this factor in the research study, participants shall complete a questionnaire pertaining their demographics, living conditions, and frequency of work conducted both in the workplace and at home over the duration of the study. In addition to this factor, according to the Personal Resource Allocation

Model by Garwitch, Ballard & Erb, (2015) as well as stress management research, the most effective approach to SMLs is a multilevel and multifaceted approach.

However, due to size, time and situational limitations on the present research study, only a single level & single focal intervention can be implemented therefore is not representative of a study into the most effective stress management intervention.

Furthering this, due to the extensive length of the study, as well as the online medium through which it was conducted, there was a significant rate of attrition throughout the study with 3 participants voluntarily withdrawal from the study, 3 participants failed to return required questionnaires and a total of 4 participants failed to complete the minimum required 6 out of 8 yoga sessions. In addition to this, there is a potential risk associated with this study that participants may have falsified their responses to the surveys for a range of bias factors, such as social desirability.

Heuristic value. Based on the present study findings, interpretation, and above discussed considerations, there are several points which have the potential to stimulate further thinking and research on this topic. Firstly, although yoga has been found to significantly reduce stress within the yoga group, the overall decrease in comparison to the control group produced a non-statistically significant thus the findings provided inconclusive results indicating a need for further research on this topic, particularly within the South African Context. This lack of statistical significance is potentially accounted for by the time and resource limitations placed on this project as an honors research project, therefore, the second point indicates a need for future studies with greater resources, fewer restrictions, as well as a substantially larger sample size will be beneficial providing more valid and reliable results within the South African Context.

Leading on to the third point, which stems from both the poor representativeness of the study sample as well as the discrepancies in decreased PSS scores between racial groups in the yoga group. Findings showed that within the yoga group the 3 participants of color recorded the lowest reduction in PSS with the average decrease in PSS for the three participants of color being 2, compared to the average PSS decrease of the white participants being 12.14, providing an area for future exploration into the cross cultural applicability of such an intervention, as well as into additional contextual factors such as accessibility, income, social support which may be contributing to the stress levels of non-white communities in South

Africa. Future research should also ensure a greater representative sample of the South African cultural and racial context to increase the validity of future findings.

Conclusion.

Stress is an inescapable component of our daily lives and presents significant risks to people in both their personal and professional lives as a result of the range of physiological, psychological and behavioral outcomes of stress on the body. Within the context of work, negative stress can significantly harm organizational outcomes through higher levels of absenteeism, greater employee turnover, and impaired concentration. As a result, it is vital for organizations to effectively assist stress management to ensure optimal performance of the company as a whole. In recent years, research has produced a sharp increase in international stress and stress management related articles, including the exploration of yoga as a stress management intervention however there is both conflicting results on the topic of yoga for stress management as well as a significant gap in research such studies conducted within the context of South Africa. Therefore, the present study aimed to both contribute to the field of stress management research in South Africa as well as address the conflicting findings on the topic through examining the effects of a yoga intervention on perceived stress levels within the workplace.

Through an experimental design, the present study aimed to address the question: Does the implementation of yoga in the workplace lead to a significant decrease in perceived stress amongst employees? Based on prior research which indicated an association between yoga and stress levels in various international contexts, it was hypothesised that a negative relationship will exist displaying a reduction in perceived stress with the implementation of the yoga intervention. Through the application of an 8 week, virtual Vinyasa yoga programme two hypotheses were assessed; H₁: The yoga group will display a significant reduction in perceived stress; and H₂: The yoga group will display a significantly greater reduction in perceived stress compared to the control group.

Through the application of a dependent and independent samples t-test, results indicated that the 10 participants who received the yoga intervention for eight weeks displayed a statistically significant decrease in perceived stress ($t = 4.04$, $p = 0.0004$), from pretest in week one ($mean = 29.2$, $sd = 7.07$) compared to the posttest in week eight ($mean = 20.1$, $sd = 5.97$). However, despite this statistically significant

decrease within the yoga group, the 10 participants who received the yoga intervention ($mean = 9.1$, $sd = 6.54$) compared to the 14 participants in the control group ($mean = 6.4$, $sd = 6.81$) demonstrated a greater decrease in perceived stress over the eight week, however these results were non-statistically significant, ($t = 0.96$, $p = 0.35$). Based on these hypothesis findings, the final research results are inconclusive as although yoga has been found to significantly reduce stress within the yoga group, the overall decrease in comparison to the control group produced a non-statistically significant difference.

Therefore, although this study contributed to the field of stress management research in South Africa, due to the lack of conclusive findings as well as above discussed limitations, future research is required with greater resources, larger sample size and more appropriate representation of the South African racial cultural context.

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Figures:

Figure 1:

A box and whisker plot graph displaying the distribution of pre-intervention and post-intervention perceived stress scores of the yoga group participants.

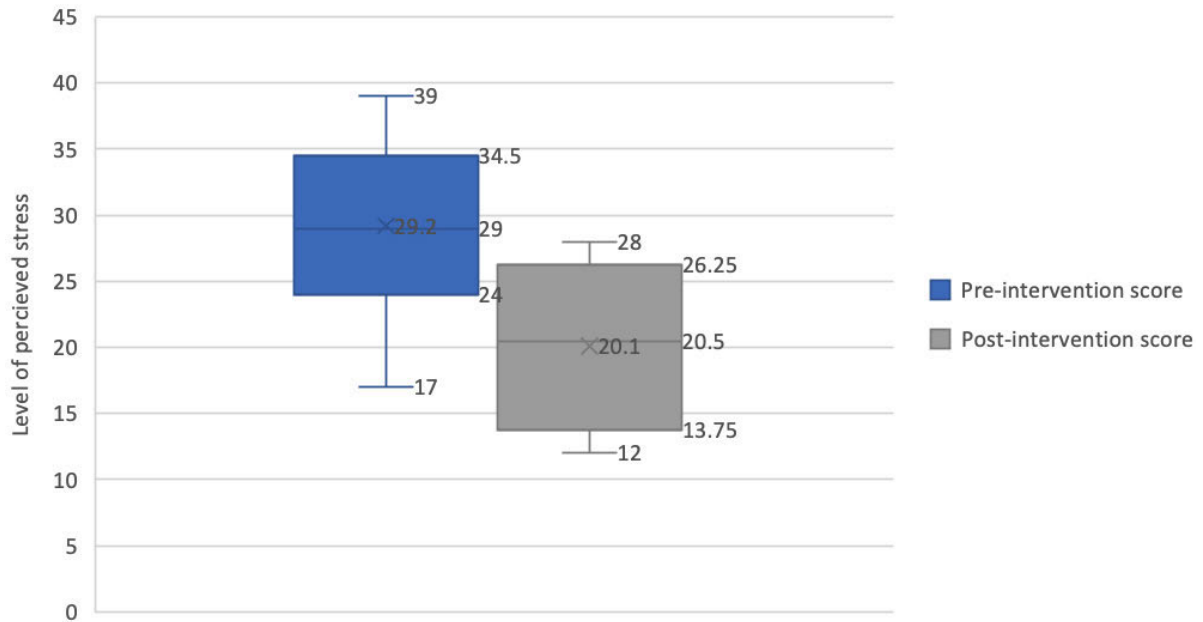


Figure 2:

A bar graph displaying the distribution on the pre-intervention perceived stress scores of the yoga group

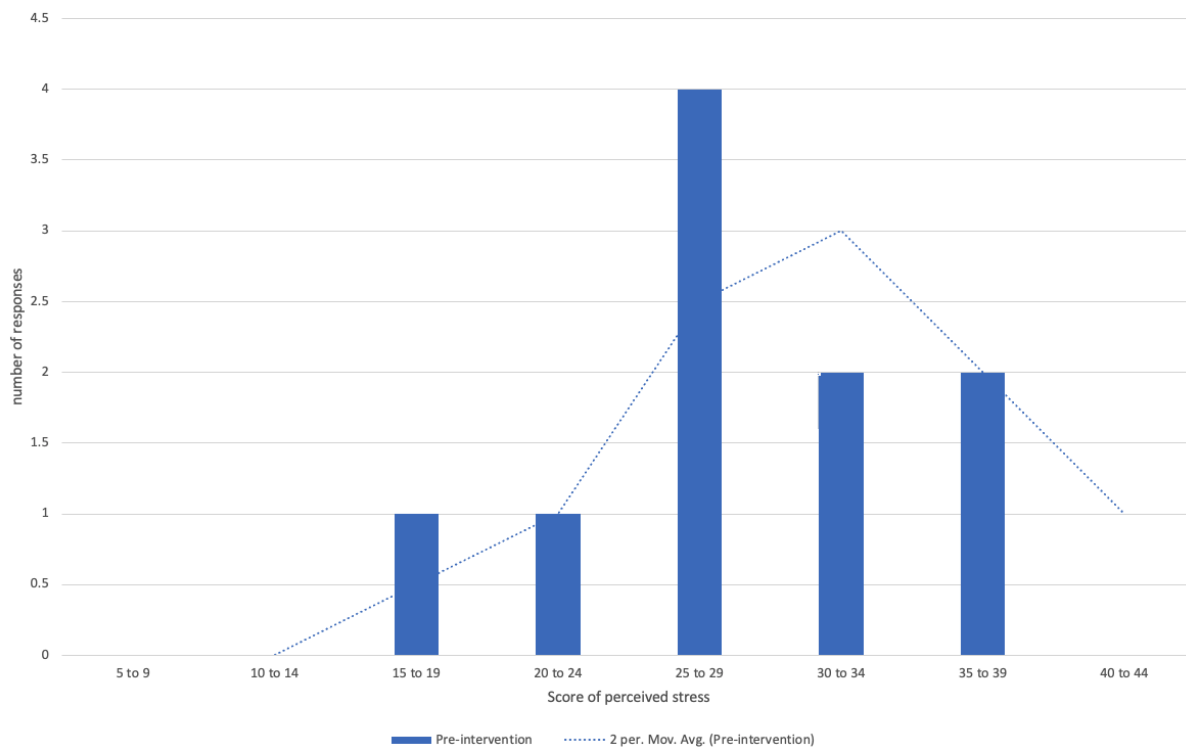


Figure 3:

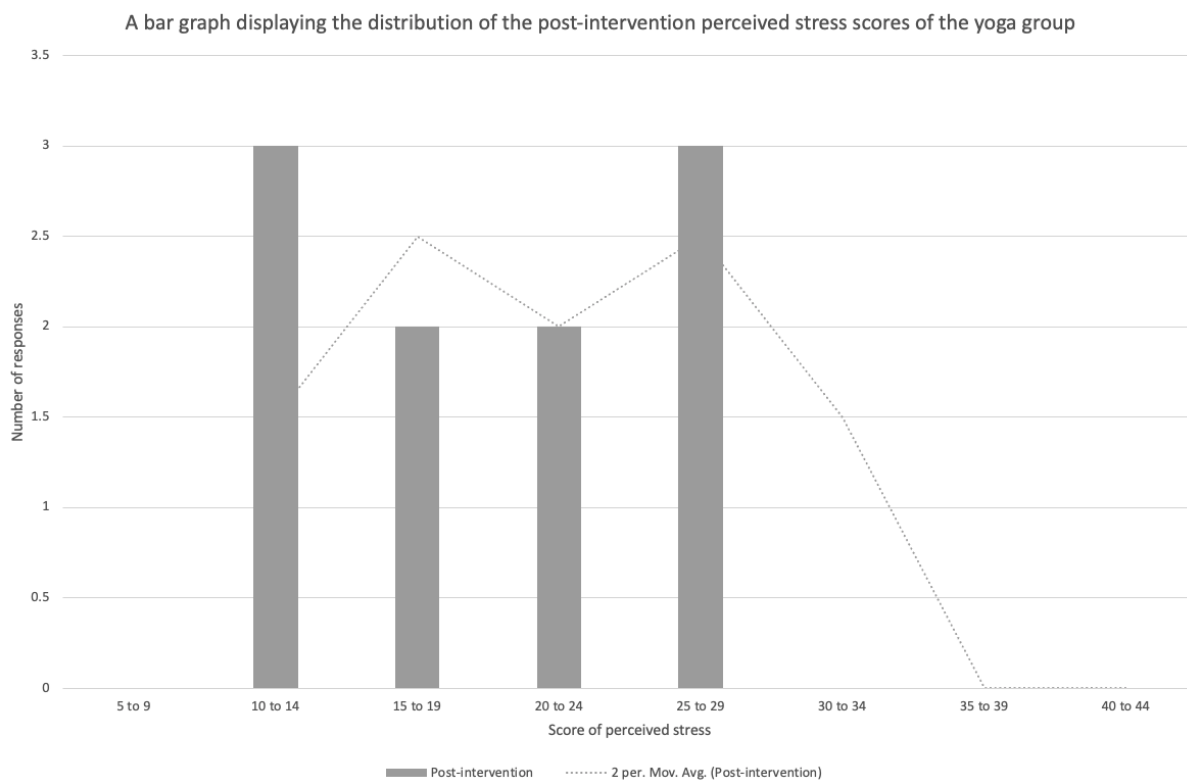


Figure 4:

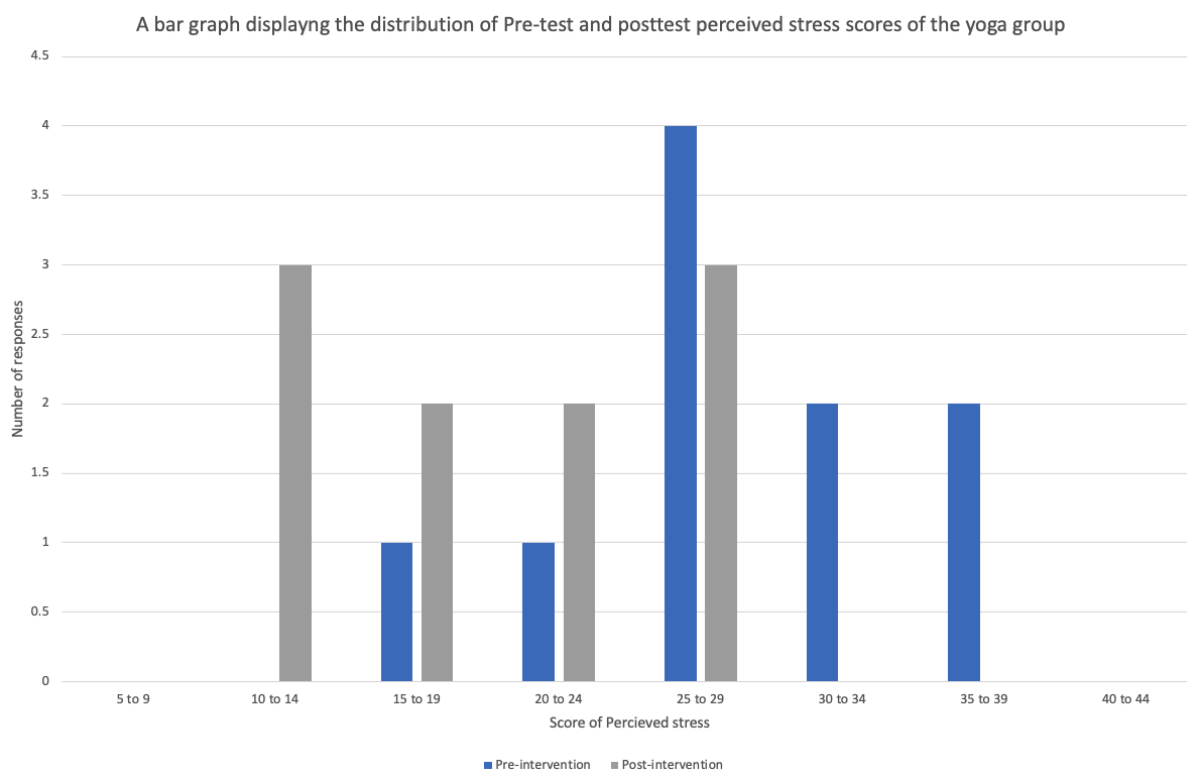


Figure 5:

A box and whisker plot graph displaying the distribution of the difference between pre-intervention and post-intervention scores of the yoga and nonyoga group.

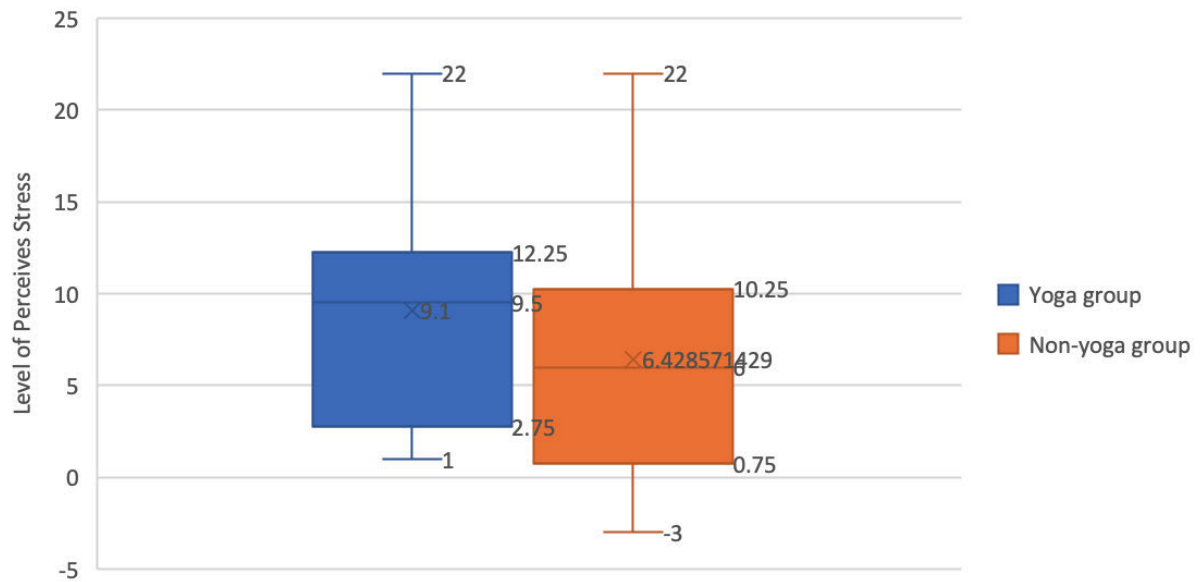


Figure 6:

A bar graph displaying the distribution of the difference of perceived stress scores of the yoga group

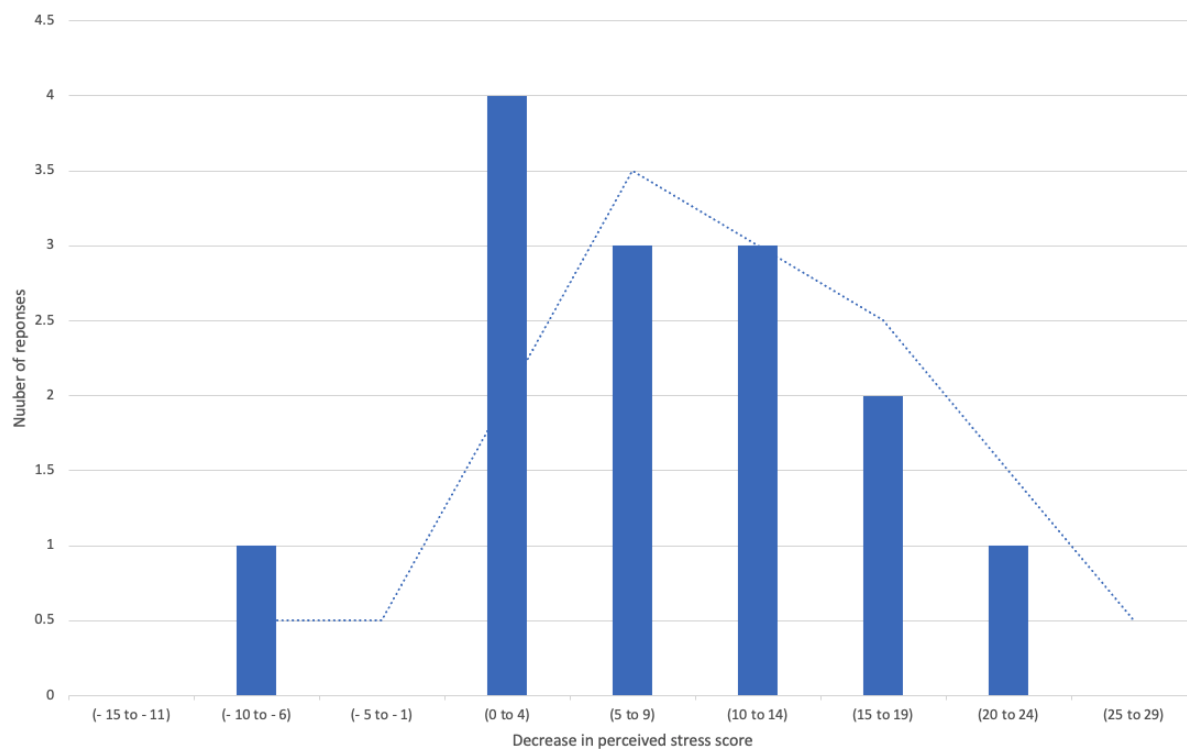


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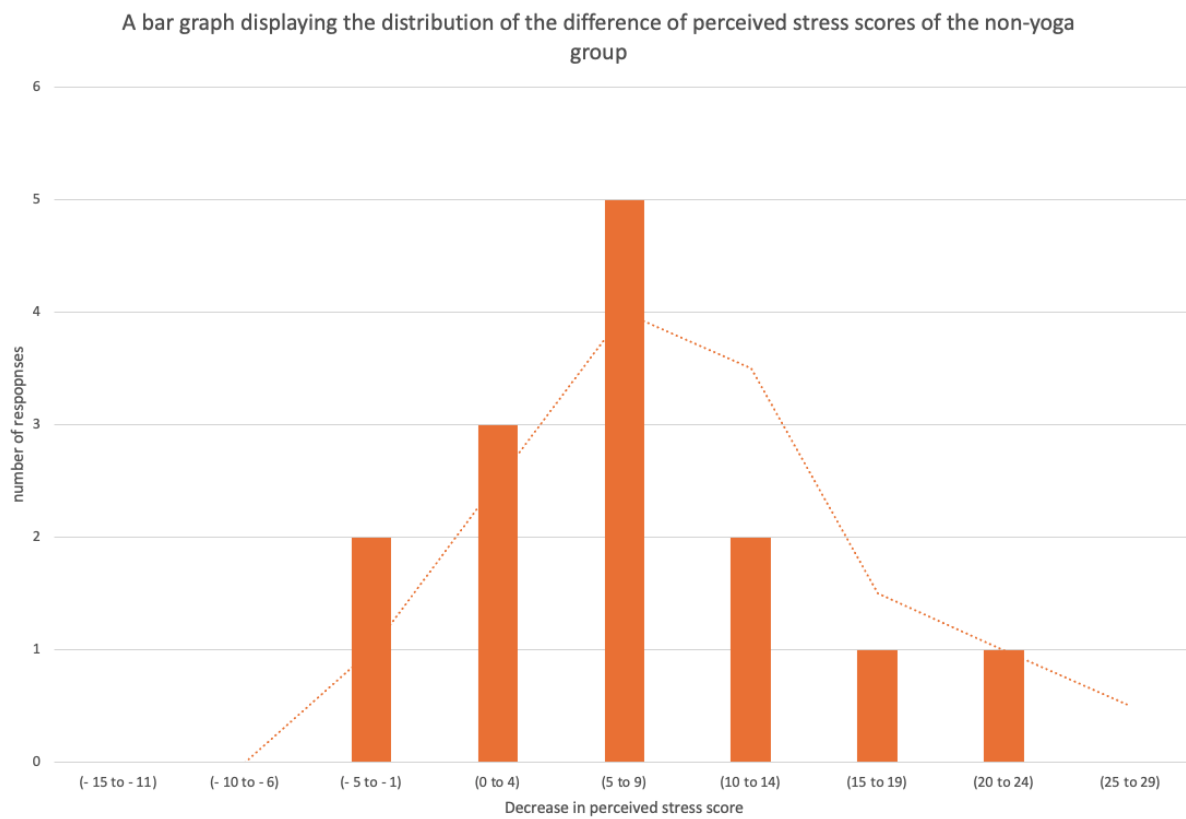
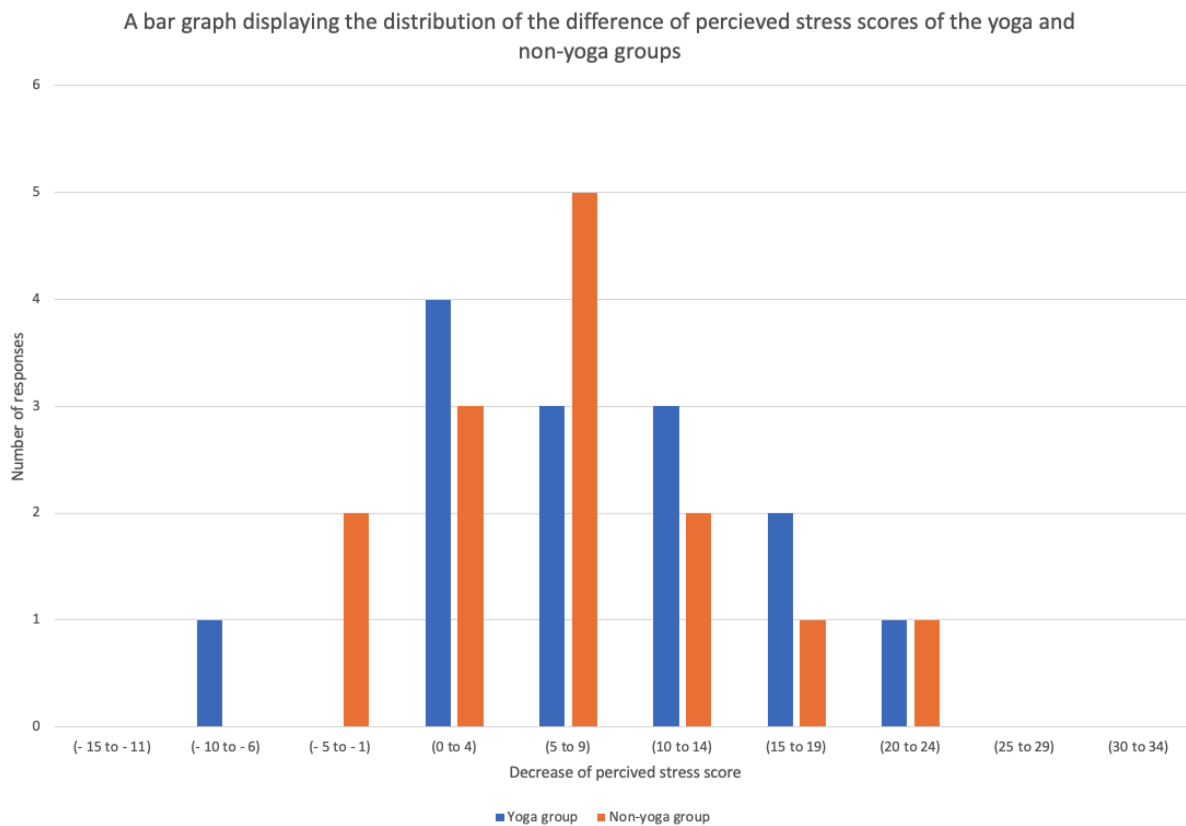


Figure 8:



Tables.

Table 1

A summary of demographic findings of participants in the research study.

	Yoga Group (n = 10)	Non-yoga group (n = 14)
Gender		
<i>Male</i>	5	4
<i>Female</i>	5	12
mean age (sd)	27.20 (3.58)	27.60 (2.82)
<i>(table continued)</i>	Yoga Group (n = 10)	Non-yoga group (n = 14)
<i>Age range</i>	24-34	24-36
Work location during the study		
<i>From home</i>	7	4
<i>In office</i>	0	1
<i>Both home and office</i>	3	9
$\bar{x}$ work hours/ week (σ)	40.50 (6.43)	42.32 (13.26)
Exercise		
<i>Median hours of exercise/week</i>	2 to 3	3+
Type of exercise during the study		
<i>Yoga</i>	10	4
<i>Cardiovascular</i> ¹	9	14
<i>Strength</i> ²	2	10
Mixed ³	1	3

Table 2A*A summary of perceived stress scores of the yoga and non-yoga groups.*

	PSS (week 1)	PSS (week 8)	Decrease in PSS
Yoga group			
Mean (sd)	29.2 (7.07)	20.1 (5.97)	9.1 (6.54)
Non-yoga group			
Mean (sd)	29.4 (5.94)	22.9 (6.27)	6.4 (6.81)

Table 2B*A summary of the Perceived stress scores of the yoga group.*

	PSS (week 1)	PSS (week 8)	t-value	p-value
Yoga group				
Mean (sd)	29.2 (7.07)	20.1 (5.97)	4.40	0.0004

Table 2C*A summary of the decrease in Perceived stress Scores, t-value and p-value of the yoga and non-yoga groups*

	Yoga group (n = 10)	Non-yoga group (n = 14)	t-value	p-value
Mean (sd)	9.1 (6.54)	6.4 (6.81)	0.96	0.35

Table 3

A summary of the decrease in PSS scores and exercise demographics in both the yoga and non-yoga group.

	Yoga Group (n = 10)	Non-yoga group (n = 14)	T score	P value
Decrease in PSS				
Mean (sd)	9.1 (6.54)	20.1 (5.97)	0.96	0.35
Exercise				
Median hours of exercise/ week	2 to 3	3+		
Types of exercise during the study				
Yoga	10	4		
Cardiovascular ¹	9	14		
Strength ²	2	10		
Mixed ³	1	3		

¹walking/ running/ cycling/ hiking/ skipping/ HIIT

²weights/ weight training/ pilates/ bodyweight training

³surfing/ muay thai

Appendix A: Final research report summary document

Annexure A: Final research report summary document TITLE: Revitalizing personal resources: A study on Organizational Stress Management through the implementation of yoga in the workplace.										
Research Purpose/ Objective	Primary Research Question	Research Rationale	Seminal Authors/ Sources	Literature Review – Conceptual Framework	Paradigm	Approach	Data Collection Method(s)	Ethics	Key findings	Recommendations
To establish whether yoga as a wellness intervention can effectively assist in reducing levels of perceived stress in the workplace within a South African context.	Does the implementation of yoga in the workplace lead to a significant decrease in perceived stress amongst employees	The cumulative impacts of stress, if improperly managed leads to impaired functioning in the workplace thus negatively impacting the functioning of the organization (Hussin, 2008). As a result, it is vital for organizations to effectively assist stress management to ensure optimal performance of the company as a whole.	Hartfield et al. 2012 and Aven & Follin, 2016 on yoga for stress reduction. Grawitch, Ballard & Erb, 2014 on PPA. Sharma, Chauchan and Khanna whom review yoga for stress management in the corporate sector. Cohen's Perceived stress scale. Thakur, 2016 on yoga and stress management. Hewet et al. 2011 on 8 weeks of yoga in the workplace.	Workplace stress. Stress outcomes. Perceived stress. Workplace interventions. Yoga and stress. Yoga in the workplace.	Functionalism: (1) It is founded in the systems of survival routed in the biological functionality of organisms and individuals. This is observed in the physiological effects of stress on the body: the fight-or-flight system. (2) Additionally, the organizations and societies may evolve around the organism to better optimize functioning. This is reflected in the implementation of organizational interventions to assist employee performance in the workplace.	The present study adopted a Quantitative, experimental approach & design. This assisted in the statistical analysis of the effectiveness on the intervention on the perceived stress levels. As stress is difficult to quantify, perceived stress levels were examined.	Data was collected through the use of the Perceived Stress Scale Survey by Cohen, as well as biographical surveys. These will be sent and returned via Email due to the COVID-19 pandemic.	There are no risks associated with the present study. Participants ID will remain know only to the researcher and any information provided will be saved on a password secure hard drive. Participants will be required to sign an informed consent form. Control group will be provided eight weeks of access to the yoga content after the final data collection.	The implementation of yoga showed to significantly reduce stress in the yoga group alone, but not statistically significantly in comparison to the control group. Limiting factors discussed in the study account for this and suggest future research with larger sample size that is more representative of the population be conducted.	Larger sample size. Implement intervention and research data collection in person to reduce rate of attrition. Greater ethnic and cultural representation in relation to the South African context. Further exploration into the appropriateness of yoga as an intervention in multicultural settings. Further research into factors contributing to PSS discrepancies between racial groups in South Africa as well as an exploration into the most effective intervention to reduce such impacts on the various societies.
						Population	Sampling	Data Analysis Method(s)	Key Contribution	
						Individuals working corporate office environments, in South Africa.	24 participants between the ages 24-36 years, no limits on gender, race or yoga experience level. Participants must exercise between 1 – 4 hours a week, have access to a stable internet connection for study duration, have a device to access study content (smartphone/ computer/ laptop). PURPOSIVE SAMPLING will be used due to the restrictive criteria which is established to reduce the effects of confounding variables.	Statistical analysis: To address H1, a test of statistical significance: a dependent samples t-test on the pre-intervention and post-intervention PSS of the control group was conducted. To address H2, a test of statistical significance: an independent samples t-test on the decrease in PSS of the control group and experimental group was conducted.	Increased research in the field of stress management as well as yoga in stress management in the South African Context. Findings yielded inconclusive results contributing to the controversy of whether yoga is effective in stress reduction.	
Research Problem	Secondary Questions/ Hypotheses/ Objectives	Key Concepts	Key Theories							
Stress in the workplace leads to impaired job performance. Thus negatively impacts organizational Outcomes.	H1: The yoga group will display a significant reduction in perceived stress. H ₂ : The yoga group will display a significantly greater reduction in perceived stress compared to the control group.	Stress, perceived stress, stress management, yoga for stress management, wellness interventions in the workplace, yoga as a workplace intervention and measures of perceived stress.	Transactional Stress theory. Personal Resource Allocation.							

Appendix B: Ethical clearance letter



30 June 2020

Student name: Kerrith O'

Fee Student number:

20105720 **Campus:**

Varsity College Cape Town

Re: Approval of Honours in Psychology Proposal and Ethics Clearance

Your research proposal and the ethical implications of your proposed research topic were reviewed by your supervisor and the campus research panel, a subcommittee of The Independent Institute of Education's Research and Postgraduate Studies Committee.

Your research proposal posed no significant ethical concerns and your supporting documents and instruments are in order to proceed. We hereby provide you with permission to proceed with your research.

In the event of you deciding to change your research methodology in any way, kindly consult your supervisor to ensure all ethical considerations are adhered to and pose no risk to any participant or party involved. A revised ethical clearance letter will be issued.

We wish you all the best with your research!

Supervisor: Dr Sarah Heany

Campus Postgraduate Coordinator (CPC): Dr Marizanne Grundlingh

GENERAL CONDITIONS TO BE FULFILLED IN RELATION TO RESEARCH

Permission is granted to proceed with the above study subject to the conditions listed below being met and may be withdrawn should any of these conditions be flouted.

[REDACTED]

Permission is granted subject to the following conditions:

1. The researcher(s) will need to obtain informed consent in writing from all of the participants in his/ her sample if the study is not anonymous.
2. The researcher(s) may only use the data collected for research purposes and in no other way.
3. Photographs of human subjects may only be taken if relevant to the research, informed consent was obtained, and even with informed consent, the photographs may not be published on any online platforms.
4. The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.
5. No names or identifying information of participants may be used within the research and the research must be voluntary.
6. Please make it clear that the information will not be used punitively in any way and participants may in no way be counselled/advised based on this.

PSYCHOLOGY HONOURS RESEARCH PROJECT
EXAMINING YOGA IN STRESS MANAGEMENT

Invitation to participate

START DATE: Monday 6th July 2020

End date: Sunday 30th August 2020

A total of 8 weeks participation.

Requires an average of 1hr/week.

TO THANK YOU FOR YOUR TIME:

For your complete participation in my research you will get one month free access to cloudfit.co.za for the month of September 2020. Check out www.cloudfit.co.za to see what you will have access to, including unlimited live yoga classes with me, Kerri O'Fee

REVITALISING PERSONAL RESOURCES: ORGANISATIONAL STRESS MANAGEMENT
THROUGH THE IMPLEMENTATION OF YOGA IN THE WORKPLACE



Hi there! My name is
Kerrith O'Fee

PSYCHOLOGY HONOURS RESEARCHER

A LITTLE BIT ABOUT ME

I am a 200hr certified Yoga Teacher (2019), currently completing my Honours Degree in Psychology at Varsity College, Cape Town. I have an Undergrad Degree in Social Sciences, from the University of Cape Town, having majored in Industrial Psychology and Psychology (2017-2019).

In addition to Studying and instructing yoga online, on CloudFIT.co.za, I am a part time Practice Coordinator at a sports health facility called The Sports Rehab Centre, in Cape Town.

MY FUTURE GOALS

I have a passion for wellness management, particularly within the workplace. As we progress through the stages of life, we spend a large part of our time working to sustain our livelihood. In addition, with rapid globalisation, increasing work demands and stress, so many people are unhappy, underperforming or unsatisfied with their current roles.

Through the use of my psychology qualifications, research efforts and yoga certifications, I aim to make a significant impact in the workplace wellness industry.

Thus my career goal is to make as many people, as happy, healthy and satisfied in the workplace as possible, so that they may live a more fruitful and fulfilling lifestyle.

HONOURS RESEARCH

As a part of my Psychology Honours Degree, I am required to complete a research paper. As I have a passion for wellbeing management and industrial psychology, I

RESEARCH PARTICIPANTS NEEDED.

Do you meet the following criteria?

- Currently employed in a **corporate/ office job** (working at home and/ or in the office space)
- Between the ages **24-40 years**.
- Live in **South Africa**.
- Able to **read and write in English**.
- Currently **exercise** between **1 - 4 hours a week**.
- Have access to a **stable internet** connection during the study.
- Have a **device** to access the study content (smartphone/ PC/ laptop).

There are no existing limitations on gender, race or yoga experience level for participation in this study.



What does participation in the study entail?

START DATE: 6TH JULY 2020 • END DATE: 29TH AUGUST 2020

Visual Summary of maximum time required:



- The research study will take a **total of 8 weeks**.
- You will be required to complete a **Perceived Stress Questionnaire** as well as a **Demographic Questionnaire** in both week 1 and week 8 of the study. These will take no longer than **30 minutes** of your time.
- Additionally, you will need to complete **one pre-recorded yoga session per week** for the 8 weeks of the study. These will take **no more than 1 hour** of your time per week, and you must complete a **minimum of 6 out of the 8 sessions**. Your progress will be tracked with an online yoga journal after each session.
- **Please note:** You may NOT be required to complete these yoga sessions, depending on your group allocation. If this is the case, you need only complete the 2 questionnaires in week 1 and week 8 of the study.

WILLING & ABLE TO PARTICIPATE?

Appendix D: Sample of the study eligibility and consent form email

(1) SIGNING OF CONSENT FORMS.

Before you may participate in the study, you are required to read through, sign and return the attached consent form. As the study is due to start on Monday, could I please ask you to do this by 5pm on Saturday 4th July. Electronic signatures are acceptable.

By signing the consent form you agree to participate in the research conducted by Kerrith O'Fee to establish whether yoga as a wellness intervention effectively assists in reducing levels of perceived stress in the workplace within a South African context. In addition, by signing this form you understand that:

- You agree to complete the required surveys for this research.
- Your confidentiality will be ensured. Your name and personal details will be kept private.
- Your participation in this research is voluntary and you have the right to withdraw from the research at any time. There will be no repercussions should you choose to withdraw from the research.
- You may choose not to answer any of the questions that are asked during the research interview.
- You may be quoted directly when the research is published, but your identity will be protected.

RESEARCH PARTICIPANTS NEEDED.

Do you meet the following criteria?

- Currently employed in a **corporate/ office job** (working at home and/ or in the office space)
- Between the ages **25-40 years**.
- Live in **South Africa**.
- Able to **read and write in English** (South African matriculant level).
- Currently **exercise** between **1 - 3 hours a week**.
- Have access to a **stable internet** connection during the study.
- Have a **device** to access the study content (smartphone/ PC/ laptop).

There are no existing limitations on gender, race or yoga experience level for participation in this study.



To verify your eligibility to participate, when you return your consent form, please copy, paste and complete the sections in bold:

- I, **(full name)** am employed in a corporate/ office Job in South Africa as **(job title)**.
- I am **(age in years)**.
- I, currently live in **(city, province)** in South Africa
- I confirm that I am able to read and write in English as a South African Matriculant level.
- I currently exercise about **(number)** hours per week.
- I confirm that I have access to a stable internet connection for the duration of the study (8 weeks).
- I confirm that I have a device to access the study content on **(smartphone/ PC/ Laptop/ Tablet)**.

Please be honest in your responses, even if you do not meet the criteria on an item.

(3) THE PARTICIPATION REQUIREMENTS

Let's take an in depth look at what the next 8 weeks (6th July – 29th August) will require of you as a participant in this research study.

PLEASE NOTE, THROUGHOUT THE DURATION OF THE STUDY, REGARDLESS OF YOUR GROUP ALLOCATION, YOU MUST CONTINUE WITH YOUR LIVES HOWEVER IS NORMAL FOR YOU. This includes, but is not limited to your eating, exercise, sleep and socialising habits.

ONLY IF YOU ARE IN THE 'YOGA GROUP' WILL YOU BE REQUIRED TO COMPLETE ONE PRE-RECORDED YOGA SESSION A WEEK ON TOP OF YOUR USUAL LIFESTYLE HABITS.

Example:



Incomplete



Complete

4. WEEK 2 – WEEK 7: Monday 13th July – Sunday 29th August

I will be checking in weekly, on Fridays, via email throughout the FULL 8 weeks of the study. I will be doing so, simply to check in and keep you updated on our progress through the study time line. See the attached timeline PDF.

IF YOU ARE IN THE YOGA GROUP, PLEASE CONTINUE WITH YOUR DAILY LIVES AND ROUTINE AS NORMAL WHILST COMPLETING YOUR WEEKLY YOGA SESSION PROVIDED, AS PER THE EXPLANATION IN YOUR WELCOME VIDEO. KEEP UP TO DATE WITH THE STUDY PROGRESS THROUGH THE WEEKLY CHECK INS. *Please note: You need to complete a minimum of 6 out of the 8 yoga sessions to be a valid 'complete participant' and gain access to the month free on CloudFit. Failure to complete a minimum of 6 sessions will lead to being assigned as in invalid participant and thus not applicable for the post study benefit.*

IF YOU ARE IN THE NON-YOGA GROUP, PLEASE CONTINUE WITH YOUR DAILY LIVES AND ROUTINE AS NORMAL. KEEP UP TO DATE WITH THE STUDY PROGRESS THROUGH THE WEEKLY CHECK INS.

I am looking forward to working with you over the next 8 weeks!

Kind Regards,
Your Researcher,
Kerrith O'Fee

2 attachments

 CONSENT FORM. pdf.pdf
62K

 Timeline 3 July.pdf
44K

Appendix E: Consent Form



CONSENT FORM

Explanatory information sheet and consent form for participants
To whom it may concern, My name is Kerrith O'Fee and I am a student at IIE Varsity College, Cape Town. I am currently conducting research under the supervision of Sarah Heany to establish whether yoga as a wellness intervention effectively assists in reducing levels of perceived stress in the workplace within a South African context. The cumulative impact of stress, if improperly managed, leads to impaired functioning in the workplace through higher levels of absenteeism, turnover, poor sleep quality and impaired concentration, which significantly impact organizational outcomes and increase company expenses. I hope that this research will enhance our understanding of effective stress management practices in the workplace, within a south African context. In doing so, organizations may gain insight into more effective stress management techniques for the personal benefit of employees as well as the overall outcomes of the company. I would like to invite you to participate in my study. In order to explain to you what your participation in my study will involve, I have formulated questions that I will try to fully answer so that you can make an informed decision about whether or not to participate. If you have any additional questions that you feel are not addressed or explained in this information sheet, please do not hesitate to ask me for more information. Once you have read and understood all the information contained in this sheet and are willing to participate, please complete and sign the consent form below.
What will I be doing if I participate in your study?
I would like to invite you to participate in this research because you fit the participant requirements of my research study which are that you; currently work a corporate job in Cape Town, South Africa; are between the age 25-40 years, are able to read and write English at a South African matriculant level of 50% or above, currently exercise between 1 – 3 hours a week, have access to a stable internet connection for the ten weeks of the study, have a device to access study content on (smartphone/ computer/ laptop).

If you decide to participate in this research, I would like to collect information on your level of perceived stress and lifestyle over a period of 10 weeks. This will be done using the Perceived Stress Scale as well as a demographic questionnaire with details about your current work life, living conditions and exercise habits in both week 1 and week 10 of the study. Between this time, from week 2 to 9, you need to give no more than 1 hour per week of your time to do a pre-recorded yoga class, which you must complete at least six of the eight sessions. These will be monitored by a yoga journal completed online after each session. You may, or may not be required to complete these yoga sessions, depending on your group allocation as one group will required to complete the yoga classes weekly whilst the other group shall continue as normal for the duration of the study

You can decide whether or not to participate in this research. If you decide to participate, you can choose to withdraw at any time or to decide not to answer particular interview questions.

Are there any risks/ or discomforts involved in participating in this study?

Whether or not you decide to participate in this research, there will be no negative impact on you. There are no direct risks or benefits to you if you participate in this study. You might, however, indirectly find that it is helpful to talk about your perceived stress. If you find at any stage that you are not comfortable with the line of questioning, you may withdraw or refrain from participating.

Do I have to participate in the study?

- Your inclusion in this study is completely voluntary;
- If you do not wish to participate in this study, you have every right not to do so;
- Even if you agree to participate in this study, you may withdraw at any time without having to provide an explanation for your decision.

Will my identity be protected?

I promise to protect your identity. I will not use your name in any research summaries to come out of this research and I will also make sure that any other details are disguised so that nobody will be able to identify you. Nobody else, including anybody at **IIE Varsity College, Cape Town** will have access to your interview information. I would like to use quotes when I discuss the findings of the research, but I will not use any recognizable information in these quotes that can be linked to you.

What will happen to the information that participants provide?

Once I have finished all questionnaires, I will write summaries to be included in my research report, which is a requirement to complete my Psychology Honours Degree. You may ask me to send you a summary of the research if you are interested in the final outcome of the study.

What happens if I have more questions about the study?

Please feel free to contact me or my supervisor should you have any questions or concerns about this research, or if there is anything you need to know before you decide whether or not to participate.

You should not agree to participate unless you are completely comfortable with the procedures followed.

My contact details are as follows:

The contact details of my supervisor are as follows:

Consent form for participants	
I, _____, agree to participate in the research conducted by Kerrith O'Fee to establish whether yoga as a wellness intervention effectively assists in reducing levels of perceived stress in the workplace within a South African context. The cumulative impact of stress, if improperly managed, leads to impaired functioning in the workplace through higher levels of absenteeism, turnover, poor sleep quality and impaired concentration, which significantly impact organizational outcomes and increase company expenses. I hope that this research will enhance our understanding of effective stress management practices in the workplace, within a south African context. In doing so, organizations may gain insight into more effective stress management techniques for the personal benefit of employees as well as the overall outcomes of the company. This research has been explained to me and I understand what participation in this research will involve. I understand that: • I agree to complete the required surveys for this research. • My confidentiality will be ensured. My name and personal details will be kept private. • My participation in this research is voluntary and I have the right to withdraw from the research at any time. There will be no repercussions should I choose to withdraw from the research. • I may choose not to answer any of the questions that are asked during the research interview. • I may be quoted directly when the research is published, but my identity will be protected.	
Signature	Date

Appendix F: Sample of the welcome email

Good morning [REDACTED]

Happy Monday and welcome to the official start of the data collection for the research study on yoga and perceived stress!

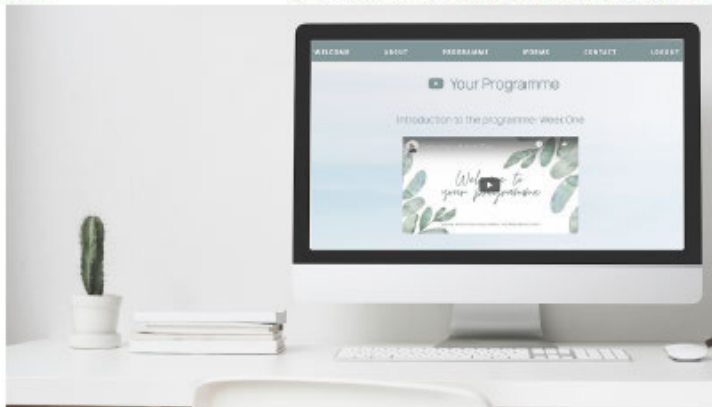
Please may you see the two attached forms for your completion: (1) Demographic Questionnaire and (2) Perceived Stress Questionnaire. Please complete these two forms by **12pm on Friday 10th July 2020**. I have attached BOTH a word document and a PDF for your choosing. Please complete either one and send them back by July 10th.



Additionally please see your details for logging into the research study website:

28/10/2020

Gmail - HONOURS RESEARCH: YOGA AND PERCEIVED STRESS. WEBSITE LOGIN



Please do get in touch with any questions, concerns or if you have any issues with the website.

Many thanks,
Kerrith O'Fee

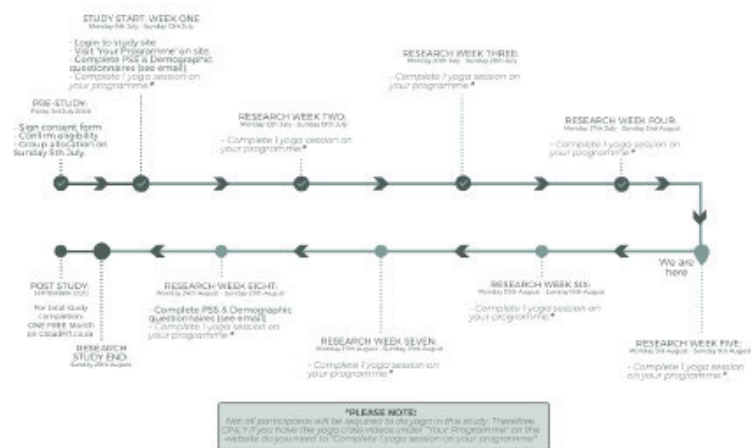
4 attachments

-  **Demographic Questionnaire ONE word.docx**
17K
-  **Demographic Questionnaire ONE.pdf**
63K
-  **PSS Questionnaire ONE.pdf**
37K
-  **PSS Questionnaire ONE word.docx**
16K

Appendix G: Sample of weekly email communications to the non-yoga group throughout the study.

Good morning & Happy Monday!

Just a research study update, we are now progressing into week five of the study!



I hope that you are still in good health, physically, mentally and emotionally as we continue through this covid pandemic together! Stay safe, stay healthy and always, if you have any questions, concerns or problems relating to the study or the website, please do get in touch. This can be either via email, OR the contact page on the website, OR on

28/10/2020

Gmail - YOGA AND PERCEIVED STRESS: WEEK FIVE



Have a lovely week ahead of you.

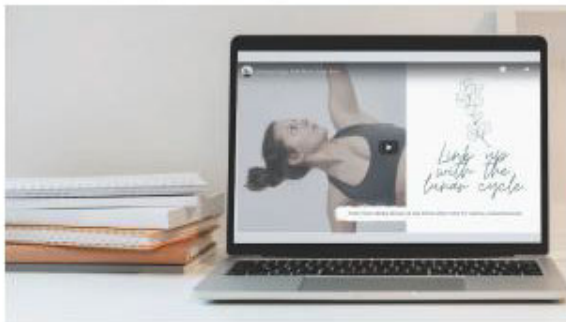
Kind Regards,

Your researcher,
Kerith O'Fee

Appendix H: Sample of weekly email communications to the yoga group throughout the study.

Good Morning and a Happy Monday,

This week is the start of WEEK FIVE of the research study! We are officially half way! I remind you that you have a yoga session to complete this week: a 45 minute flow to half moon pose (moderate intensity).



I have had a few people get in touch asking about the intensity of the sessions and I would like to officially make a new concession for you all. Yoga is about listening to your body, so as of this week:

(1) I will be including the intensity of the session so you know what to expect.

(2) if your body is feeling tired or not up to a more intense session you are welcome to complete any other session on my Youtube yoga channel as long as it is a MINIMUM OF 30 MINUTES.

You may access my YouTube channel via: https://www.youtube.com/channel/UCrZPYUJHGFqm_yUCv_AjxYQ

I would recommend that you find the gentler sessions in the "Breathe" playlist if your body needs to take it easy.



For additional support in your at home yoga practice, please do take a look on Instagram: https://www.instagram.com/_yoga.with.ko/ where you may find some useful videos on how to improve your form and practice.

You may also get in touch with me directly via Whatsapp (+27 83 2683 909) if you have any questions about your yoga session. Maybe you want to check your form or are unsure about something I said. Then please just pop me a message and maybe a video so I can give you some virtual assistance with tips, adjustments and more support.

Gmail - YOGA AND PERCEIVED STRESS: WEEK FIVE AND ADDITIONAL SUPPORT



CURRENTLY, YOU HAVE COMPLETED: 4/5 YOGA SESSIONS THUS FAR.
You have until Sunday, midnight to complete your session for this week.

If you have any questions, concerns or problems relating to the study or the website, please do get in touch with me ASAP either via email, OR the contact page on the website, OR on Whatsapp (+27 83 2683 909) for a speedier response.

I hope you have a lovely weekend, and week to follow.

Kind Regards,

Your researcher,
Kerith O'Fee



PERCEIVED STRESS SCALE

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 by circling *how often* you felt or thought a certain way.

Name _____ Date _____

Age _____ Gender (*Circle*): **M** **F** Other _____

In the last month I have worked (*Circle*):

At the office **At home** **Both** Other _____

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?

0 1 2 3 4

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

0 1 2 3 4

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

0 1 2 3 4

4. In the last month, how often have you dealt successfully with irritating life hassles?

0 1 2 3 4

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

0 1 2 3 4

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

0 1 2 3 4

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

0 1 2 3 4

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

0 1 2 3 4

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

0 1 2 3 4

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

0 1 2 3 4

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

0 1 2 3 4

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

0 1 2 3 4

13. In the last month, how often have you been able to control the way you spend your time?

0 1 2 3 4

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

0 1 2 3 4

DEMOGRAPHIC QUESTIONNAIRE

These questions ask you about your personal information, living conditions and exercise habits during the last month. Please answer truthfully. Any information disclosed here **will remain confidential** to the researcher of this study.

1. Full Name and surname:

2. Age (years):

3. Gender (tick):

☐ **Male**

☐ **Female**

☐ Other:

4. Highest Education Level (tick):

☐ **Secondary** (or equivalent)

☐ **Tertiary** (University equivalent)

☐ Other:

5. Marital Status: (tick)

☐ **Single**

☐ **Married**

☐ **Divorced**

☐ **Widowed**

ABOUT YOUR WORK

6. Current Job Title:

7. Current Employer(s):

8. Average work hours per week:

9. In the past month where has been your workspace? (tick)
- ☐ **Home office/ home**
 - ☐ **Employer office/ shared workspace** (not owned by employer)
 - ☐ **Mixture of at home and employer office/ shared workspace**
 - ☐ Other: _____

ABOUT YOUR HOME ENVIRONMENT

10. What type of accommodation do you have? (tick)
- ☐ **House**
 - ☐ **Apartment**
 - ☐ **Cottage**
 - ☐ Other: _____

11. Do you live with other people? (tick)

- ☐ **Yes**
- ☐ **No**

If yes, how many other people do you live with? _____

12. Do you live with a Spouse/ partner?

- ☐ **Yes**
- ☐ **No**

13. Do you live with children (0-18 years)?

- ☐ **Yes**
- ☐ **No**

If yes, how many children? _____

If yes, what is your relationship to these children? _____

ABOUT YOUR EXERCISE LIFESTYLE

14. In the last month, how long, on average have you exercise per week? (tick)

- ☐ Less than 1 hour
- ☐ 1-2 hours
- ☐ 2-3 hours
- ☐ More than 3 hours

15. In the last month, what type of exercise do you typically do? (please list)

