The Use of Virtual Reality Experiences to Aid the Reduction of Workplace Stress

DBA Dissertation

by

ASH PATEL

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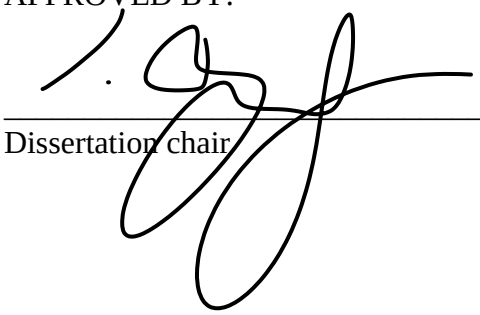
APPROVED BY:



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ABSTRACT

The Use of Virtual Reality Experiences to Aid the Reduction of Workplace Stress

The world economy, and in direct connection, society relies on millions of people around the world to work. Work in the context of industrial, commercial, retail, governmental, and other settings. The workforce, made up of varying demographics, experiences, and competencies, relies on physical, and mental well-being to perform. It is shown that workplace-related health issues are costly for a number of reasons as outlined in this report. As a particularly important aspect of workforce health, mental health has often been unrecognized, and not addressed appropriately. Specifically, this research study focuses on workplace stress, as defined throughout the content, and qualified through the literature review. Stress, as recognized as a predicator to anxiety.

Workplace stress, whether it is a direct result of occupational activities, or domestic oriented, has costly consequences, such as reduced productivity, turnover, health care cost increases, conflicts, and degradation of innovation.

This research study is purposed for the testing of the use of virtual reality experiences to aid in the mitigation of workplace stress. Through the process, the nature of stress experienced, and reactions to the exposure to virtual reality are defined. Attitudes, and perceptions of participants are correlated to their reporting of the success of the experiences.

This research study is particularly important to establish evidence of the efficacy of one, non-traditional, method to mitigate workplace stress. This, in turn, will open the

potential for wider research into the effectiveness of virtual reality experiences to achieve stated results, and the outlining of a framework for evolution of their production.

The researcher has selected this topic because of a passionate connection to workplace stress, and his association with virtual reality experience production. The researcher has the determination to validate the effective outcomes of combining the two areas of interest.

Directed by: Dr. Saša Petar

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DEDICATION

I dedicate this work to my son, **Krish Patel**, who without hesitation or complaint has helped me diligently and inspired me to make this possible.

ACKNOWLEDGEMENTS

This study, through years of through about process, data and reporting, could not have been possible without the guidance of my supervisor, Dr. Saša Petar. A doctorate thesis is complex and can be daunting at times. Dr. Petar helped me in many ways to navigate the process, added some inspiration and helped to make sure that the end result would be what it is – high in quality, depth and premise. Thank you, Dr. Petar.

Many people in my network have given their time (multiple times in some cases) to participate in data collection, exposure to virtual reality technology and providing general guidance about what works and does not. Without a network of like-minded and passionate people, this study would not be possible.

Family are those you are with most of the time, inherit much passion from and look to for the ultimate sense of gratification. My wife, Sulekha, children, Maya, Meghana and Krish and my mother Kusum, have been a source of inspiration and reference point for process. They have been my sounding board and curators of what is possible. I thank them for their confidence in me, for putting up my periodic absences and constant talks about the study itself.

CHAPTER 1 - INTRODUCTION

1.1. Introduction

Stress is a common thing. The word itself is used in a very organic, and informal way by many people around the world. In a more clinical setting, stress is rigidly defined as a factor that causes bodily or mental tension (Mariam-Webster, 2022). Although not limited to this definition, individuals could use the idea of stress to explain any uneasy, tense, anxiety causing or uncomfortable situation they are facing in the mental or emotional context (Kemeny, 2003). Stress may also be used to refer to physical stressors on the human body, which can be an input to the cause of mental, and emotional stress. This research study focuses exclusively on the non-clinal mental or emotional state of stress, specifically as identified, and experienced by individuals participating in a workplace.

Although many clinical approaches to help individuals cope with stress exist, and are fully developed into robust programs (Philip Dewe, 1993), it is believed that many participants in the workforce do not have access to formal help, are not aware that they need or can get help or experience the stigma of being associated with stress. Fear of job reprisal, lowering of self-esteem, and dignity or even denial that a problem may exist are factors that prevent many people from dealing with stress caused by vocational activities (Rüsch N, 2009).

Unmitigated stress in the workplace can lead to a demotivated workforce, lower productivity, bad customer service, employee-employee or employee-manager conflicts,

turnover and/or safety issues. A resulting consequence is the increase in employer paid health care insurance costs. Based on a study in top developed nations, it is estimated that work related stress costs businesses upwards of $200 billion dollars per year (Hassard, et. el., 2018).

Virtual reality is the simulation of a realistic environment which makes use of an advanced human to computer interface (J. M. Zheng, 1998). The technology, which is relatively new, takes digital graphics, and enhances them to provide the user with an extended experience that may not exist in the real world, or is not within reach at a particular place or time. The graphics can be in the form of still images, live motion video, and audio or the combination of all of it. The digital graphics are enhanced with objects in the form of textual references, three-dimensional models or interactivity in the form of navigation capability. Such experiences can be used by participants through a variety of delivery systems such as mobile phones, laptop or desktop computers, tablets or virtual reality headsets designed for the most immersive mode for the user. Immersive in this context refers to the extent to which the users feel like their experience is as close to real as possible while being in a three-dimensional, or spherical environment to experience realism (Frasson, 2021).

The global workforce in 2022 is comprised of approximately 3.32 billion people (Clark, 2022). This number represents individuals in all sectors of the economy, from agriculture, commercial, governmental, non-governmental, finance and banking, retail to industrial organizations (Anon., 2022). The jobs being done represent all aspects of all economies and requisite skill sets that are resource, service and manufacturing based

(Voyer, 2015). In Canada alone, there is a participating workforce of approximately 19,500,000 individuals, out of a population of 38,900,000 (Anon., 2022), representing a participation rate of 50.12%. The importance of these figures is to establish an understanding that there are many people who actively contribute to economic wellbeing globally.

It is proposed that the production, and use of virtual reality experiences that involve live motion videos presented by real people can help individuals to develop strategies to cope with workplace stress.

The literature review provides insight into the existing body of work related to the workplace, stress, and coping methods. You will see that there is a gap in the research undertaken in relation to the use of virtual reality to mitigate workplace stress. You will also see that there is evidence of the use of virtual reality to help individuals deal with other aspects of their lives. You will also see the potential of virtual reality to help with stress mitigation, and regulation. This research study can help form the basis for further research and subsequent development of virtual reality experiences to help with stress, not only in the workplace, but in other areas of society.

This research study is focused on workplaces, individuals and stress. The study identifies what workplace stress is, and the extent to which it exists. This research study also provides information about what virtual reality technology and associated tools are, what their application capability is and how they can be used to help individuals develop coping strategies to deal with workplace stress.

1.2. Problem Statement

Recognizing workplace stress, and addressing it is more difficult than aiding a physical issue. Many approaches have been used to recognize and mitigate stress experienced in the workplace. These approaches are traditional in nature, involving methods such as meditation, yoga, medication or other therapy. Recognizing that different generations develop different attitudes towards treatments (Robb-Dover, 2023), it is possible that some generations are not accepting or reacting to traditional forms of stress-mitigating approaches. The problem that can arise from this is a lack of affinity with traditional methods, resulting in a lack of attention to stress. This, as outlined in this report, can lead to costly disruption for employers, including loss of productivity.

1.3. Significance of the Study

Workplace stress is a leading cause of many negative impacts to an organization, the economy, and society in general. Misunderstanding of the nature, and sources of workplace stress lead to inappropriate, insufficient or no action on the part of employers, and individuals. This may lead to long-term, systemic, and chronic problems throughout society. Organizations experience monetary, and social costs due to increased turnover, lack of productivity, loss of creative or innovative thinking, internal conflicts, low customer service levels, and other negative outcomes.

The goal of this research study is to define workplace stress, and the impact on employers. Through an extensive literature review, this study establishes an understanding of current meaning of workplace stress, approaches to dealing with it,

impact on business, including qualitative, and quantitative elements. This research study also proposes to validate, or invalidate the effectiveness of innovative use of virtual reality experiences to mitigate workplace stress, in the context of specific settings, and participant characteristics.

This research study also outlines the potential for future research related to the subject matter, specifically the framework to develop more targeted virtual reality experiences that engage particular demographics, and react to initial perceptions of its use.

1.4. Research Questions

It is proposed that the use of rich media based virtual reality experiences to mitigate workplace stress is a viable solution to the problem outlined in section 1.2. Virtual reality, with the capability of remote access, sense baselining, and innovative delivery of content may be able to aide with the program. To establish validity of the proposition, the following research questions have been be addressed:

1. Does exposure to virtual reality experiences aide in the reduction of stress?
2. Do participants accept virtual reality as beneficial,
3. What changes do participants suggest to enhance existing virtuality reality experiences,
4. What is the extent to which exposure to virtual reality experiences aides in the reduction of stress?
5. What is the extent to which workplace stress exists in specific settings?

6. What are some causes of workplace stress?
7. What programs do organizations have in place to help with workplace stress?

1.5. Limitations and Assumptions

The execution of this research study has experienced some limitations. The limitations are generally related to the methodology. Although it was thought originally that participant cooperation would be a barrier, this did not prove to be the case. In fact, informed and willing participation presented as highly positive and with characteristics much broader than expected. Participation is represented from a large field of industries, job types and organization sizes.

A key limiting factor is the size of the sample size of the virtual reality exposure group. This group, who have been given access to actual virtual reality, stress mitigating experiences, was suggested at 15 participants, with the final sample consisting of 16 individuals. This methodology stipulation was added as a result of limitations in time and space considerations. Each participant who is exposed to virtual reality experiences is required to do complete a pre-exposure survey, be exposed to the virtual reality, then complete a post-exposure survey. This process is individualized and must be done in a reasonable and controlled setting. The challenge of getting participants to allocate time and travel to a specific place (space). This proved challenging, partly due to some post-covid resistance to close-field gatherings, but also as a result of time constraints. "Our aim is to understand the current factors and attitudes towards clinical trial participation in order to assist in recruitment...". "The COVID-19 pandemic has led to additional

hurdles in achieving this." (Abdulhussein, 2022). "It is also important that the sample size is representative of the target population. Therefore, it is important to optimize recruitment to (clinical) trials, and it can be said that factors influencing clinical research are ultimately dependent upon patient willingness to participate and commit to a study.". (Abdulhussein, 2022). This study is being conducted independent of affiliation to a research institution, mainly from the home space of the researcher. "Previous studies have demonstrated several factors that can influence patient willingness to participate in research such as cost, convenience, risks and benefits, nature of the trial and motivation.". (Arnetz, 2019). In a formal, institutional space, the sample size could be increased considerably, with a prepared base of participants to draw from. This would stem from the idea that students at a formal institution would be more willing to participate in such research studies and are able to be at a specific space more readily. For the purposes of this study, the need to get a non-student population to participate is important, as individuals need to be working, or have worked in an occupational setting.

A second limitation that somewhat impacted the study is the extent to which virtual reality production and delivery hardware equipment is available. As outlined in the methodology section, the study requires the authoring, development, post-production, and delivery of one or more virtual reality experiences. The author has access to the camera equipment necessary for developing material, production software to create the three-sixty-degree virtual reality experiences, and basic dedicated headsets to deliver the content. The rudimentary nature of the equipment used, and the limited knowledge base of the author in terms of video production has resulted in workable and appropriate

virtual reality experiences, however production value could be higher with more production titles if access to institutional resources were in place. Challenging issues arise when research is done with severely limiting access to resources. (Bredan, 2020). The capacity and abilities of good research are made better when there is access to proper resources (Wernerfelt, 1984).

The independent and unique nature of this research study, and that it is done outside of a formal research institution, suggests that collaboration with like-minded colleagues may be a limitation. Interaction with faculty colleagues at a research institution is important. Researchers are dependent on intellectual connection and critique from colleagues to help establish and improve the study. (Allison, 1990). The Swiss School of Business and Management Geneva (SSBM) has been highly supportive, especially through thesis supervisor, Dr. Saša Petar. The distance nature of the program and the fact that virtual reality is a unique technology requiring resources that would not be available at a business institute. Although, as outlined in the findings, this is only suggested as a limitation to furthering the scope of the study. This would be satisfied through future work of interest.

In conclusion, several limitations to the study have been outlined. Aside from the limitation to the size of sample, the other limitations are not distractors to the study and are presented for the benefit of future research in the area. The future impact section outlines the importance of overcoming the limitations, especially related to the access to digital means and resources required to expand the scope.

1.6. Definition Of Terms

Sense Baselining

Using neutral audio and imagery to make the participant centered in terms of outside influences. A state of neutral calm.

Stress

An experience of heightened anxiety with discomfort physically and emotionally.

Workplace

A place where an individual conducts work as an occupation.

Virtual Reality

A digital space that is different from actual reality.

Experiences

A curated production that uses imagery, video and audio to convey a specific message.

Likert

A scoring system where the individual selects from a scale – usually the lower the score, the less the value of the rating.

Cohen's d

A measure of standardized difference between two means. It helps us understand the practical significance of the observed change.

Alpha

Statistical measure used to determine the probability of obtaining results due to chance.

P-Value

A statistical measure that helps in determining the significance of the results of a survey.

T-Test

A statistical measure that helps determine if there is significance in the difference between two sets of data.

1.7. List of Abbreviations

VR Virtual Reality

VER Virtual Enhanced Reality

SSBM Swiss School of Business and Management

HR Human Resources

1.8. Background

This study presents an interesting idea, that the author has developed an affinity and passion for. The associated ideas related to the key premise of the study are also of interest to the author. The key premise being the use if virtual reality technology and virtual reality experiences. The associated ideas being workplace stress and the effects on individuals and organizations.

The author, being a professional practitioner and academic in the field of human resources (HR), has developed a first-hand appreciation for the effects of stress in general, and specifically in the workplace. Definition of workplace, and an understanding of what stress has interested the author throughout his career.

The author, being a subject matter expert in the use of technology to benefit a workforce, workplace and the organization, has continually explored various tools – both existing and emerging. The essential purpose of this exploration has been to associate his work in the human resources field with technology, with a key potential outcome being

the betterment of work practices, efficiency, human satisfaction and organizational success. Success in this context can be the exercising of new opportunities or the mitigation of negative elements. As an example, technology can be used to generate more revenue, save costs or make work more efficient. Conversely, technology can be used to reduce accidents, legal dilemmas, and save lives or resources.

Specifically, and more recently, the author has embraced virtual reality technology in a variety of forms. This embrace has led to the exploration of various virtual reality delivery systems, including VR headsets and desktop deployment. It has also led to the study of authoring platforms, techniques and best practices.

Because the author has always been interested in the consequences of workplace stress, including association neurodiversity, a natural connection was made to relate to the use of virtual technology to this help in this area.

Having already won a national award in training excellence for his work with web-based technology to effect learning (cognitive domain), the author was more recently a finalist for a national award of excellence for his work on the use of virtual reality for employee onboarding and related to communities of collaborative practice.

The potential of virtual reality technology, and its capacity to establish a calming attention space, that is receptive to specific messaging. Knowing this, the author has

undertaken the work on this thesis, to show how workplace stress can be mitigated by using the same technology.

CHAPTER 2 - LITERATURE REVIEW

2.1. Literature Review Introduction

The ideas discovered from the literature review may present to be sympathetic with the focus of this paper, and provide varied perspectives about the attitudes, and motivations of participants to receive virtual reality as a tool, and the suitability of the experiences as produced. The study also uses a more developed, curated, and scripted set of experiences, as opposed to decorative or imagery-based ones used by several studies. Many virtual reality experiences use gamification, and neutral, calming imagery to cause the reduction of stress related symptoms. In a review by McDougall, he suggests that "Regardless of these facts, gamification in the context of health, and wellness as well as the use of gamification aspects in apps targeting health behavior change has only been rarely investigated so far.". (McDougall 2017). This study also changes the focus of audible stimulations to be secondary in nature, to the developed visual narrative-based experiences.

The literature review, outlined below, provides framework information about the topic of this thesis. The findings, from various sources, provide the reader insights into the meaning of stress, specifically in the workplace, the idea of a workplace, coping mechanisms for stress, and associated consequences of the same. The review also shows that there is some literature related to the use of virtual reality for stress management, but there are significant gaps that are addressed by this study. The study proposes to demonstrate, and provide evidence related to the efficacy of virtual reality experiences to

mitigate workplace stress, attitudes of participants in a workforce towards technology, and their perceptions about stress in general. It is proposed that using virtual reality tools can aid with the reduction of workplace stress.

2.2. Literature Review

The meaning of stress. Stress can be both good, and not good at different times, and in different contexts. "A stressor is a stimulus or event that is appraised, judged, or perceived as being aversive, and which causes a "stress response, which is often referred to as stress. There isn't actually a stress response, but instead there are many stress responses that comprise cognitive, behavioral, and biological changes. These stress responses have multiple adaptive functions, helping us deal with, and diminish the negative effects of the stressor.". (Anisman 2015). "A certain degree of stress is a natural, normal, and unavoidable part of everyday life." (Bamber 2011).

Steven Stein in his work 'Hardiness making stress work for you to achieve your life goals' states that 'Stress is a necessary part of life.'. The author suggests that humans experience various challenges every day. Challenges that are stressful to different degrees, causing all parts of our bodily self to react. (Stein 2020).

Authors Fischer, Ziogas, and Anton-Culver, give a very pointed assessment about what stress is;

"Many other studies have shown that major stressful events can lead to all kinds of serious illness, from heart disease to cancer. But it's not just the experience of stressful events. Rather, it's how we appraise or think about these events that seems to matter most. For example, a recent study of California women found that those who perceived

prior life events as more stressful were at greater risk for breast cancer, as compared to women who experienced the same events but perceived them as less stressful."

(Fischer, Ziogas, & Anton-Culver, 2018).

Stress that results in an elevated drive to accomplish something may add to actualization, and the resulting recognition. Many people believe that all stressors have a negative impact, but this is not the case. Some stressors cause us to be alert, and ready to deal with things around us that can cause harm. Stressors can signal our body to make ready various coping mechanisms to help us cope or survive. (Anisman 2015). On the other hand, stress that presents in the form of mental, emotional or physiological distress can be harmful to a human. Different people look at stress differently. It is not the aim of this study to label, or make the concept of stress stereotypical, but to inform the reader in the context of the hypothesis at hand. In fact, Hymie Anisman summarizes how we look at the cause of stress;

"There are a few lucky people who seem to float through life, largely unaffected by the aggravations, and hardships that others so often endure. They've got terrific jobs, a nice home, and fancy car, a summer cottage, and a stash of cash based on investments made on their behalf starting the day they were born. They attend top universities, run in the best social circles, and have loads of good friends, and alliances. We envy these luckiest people in the world, and might even delight when, on the odd occasion, they actually do suffer a setback, and we don't feel the least bit guilty… . Yet, if you were to look beyond the surface, you might find that their lives aren't dust-free, and they're not immune from life stressors. They might have multiple problems, including family, and

health issues, financial problems that are being covered up, children with a huge sense of entitlement, and they suffer the same diseases that other people do."

(Anisman 2015).

The author in this book illustrates that some of the causes of stress, and associated labels, can be generalized in a way that dilutes its' meaning. Furthermore, Hymie, et. Al. suggests that people believe that they have special insights into stress, and the processes related to it, becoming a self-professing thing.

The unique nature of workplace stress. Davies identifies 'that **stress** at work is not just about excessive job demands but also about inadequate resources to cope with those demands (Davies, 2022). "Occupational stress affects millions of people every year, and is not only costly to the individual – in terms of their mental, and physical health – but also results in major costs for organizations due to workplace absence, and loss of productivity.". (Bamber 2011).

This leads to a proposal to look at various dimensions of stress, from an organizational framework, and individual point of view. In a school setting, the emotional turmoil from the stress levels in schools can manifest in physical or medical conditions, including anxiety, low productivity, increased absenteeism, high blood pressure, depression, or other problems (Sorenson, 2007).

In a study conducted with legal professionals, Chlap and Brown found that 'stressful, and unsupportive workplaces may contribute to stress, affective distress, and burnout in lawyers that may have implications for lawyer-client interactions' (Chlap, 2022). Goleman, et al. suggest that an employee's focus can be heightened due to stress, however serious levels of stress can influence success, and create more negative

pressures (Goleman, 2002). This research study is informed by work done by Klocko and Wells in relation to how school administrators perceive common stressors, and deal with them (Klocko, 2015). A professional study by Jeong and Lee looked at the relationship between workplace stressors, and demographics such as age, gender, education, and length of service (Jeong, 2022).

The personal stressors of leaders often lead to feelings of exhaustion, frustration, unhappiness, and numerous physical symptoms (Sorenson, 2007). Davies has found that '**stress**-related ill-health is not just a matter of vulnerability on the part of the individual worker, but is also about the way in which the workplace is organized' (Davies, 2022).

Celina Oliver provides some guided insights into the idea of hardiness in the workplace. Hardiness is the extent to which individuals deal with challenges, and resulting stress. The more hardy a person is, the better they are able to cope, and the less they are likely to experience the negative aspects of stress. The author suggests that people are likely to get into jobs that require independence, and challenges if they are hardy. Conversely, risk-adverse individuals would be characterized by a lack of hardiness, and seek out less challenging, more structured occupations. (Oliver, 2009).

Stein, in review of the study conducted by Oliver, suggests that people who have elevated levels of work satisfaction (job satisfaction, pay satisfaction), are the ones who have defined a purpose in life. These individuals are satisfied with performing their duties. Hardy individuals tend to change their workplace situation to fit their comfort level, or learn to cope with what they cannot change readily. (Stein 2020).

The highly competitive nature of organizations, and the evolving nature of the job itself, places pressures on the individual to adapt or perish. An estimate accounts

for up to 40 percent of workplace illness due to stress related symptoms. (Bamber 2011). Further to this, research indicates that some elements of a job such as conflicts in duties, uncertainty, time demands, and lack of independence are key sources of workplace stress (Billings 1982).

How humans cope with stress.

A stressful situation in the workplace, such as a feeling of incompetence, reprimand from a superior, deadlines, failure to perform or social friction from co-workers can have immediate, and persistent effects on the emotional, and physical well-being of an employee. In a Harvard Medical School article, it is stated that a stressful situation can elevate stress hormones which may cause physiological changes in the body. This can include the rising of the heart rate, restrained breathing, muscle tension, nausea, and other presentations. (Harvard Medical 2020). The fight-or-flight response is the label used to describe the way a person deals with oncoming stress. Kendra Cherry explains that the fight-or-flight response happens when a person is faced with a stressful situation, that is more extreme than average. The individual consciously or subconsciously makes a rapid decision to stay, and deal with the adverse situation or 'run' or suppress the situation or ignore it. (Cherry 2019).

Chan outlines that there are two types of strategies used in the workplace. There is a set of coping strategies focused on solving a problem. There is another set of strategies used to deal with emotional stress. (Chan 2007). The Chan study suggests that, in the context of a group of nurses, a key strategy is to focus on non-work-related activities, and to work to identify the nature of the problem itself to develop an understanding. This allows the stressed individual to realize the rationality of the stress,

and produce a message that can resonate emotionally (Chan 2007). A similar study by Nakano found that individuals who use emotional focused strategies add to their stress levels, whereas those who prioritize problem focused strategies reduce stress levels. (Nakano 1991).

Viswesvaran, Sanchez and Fisher further categorize workplace stress into two similar categories. Emotional support is when a colleague works with another to allow them to release an emotionally stressful event. Instrumental support is when a colleague is helped to overcome a direct occupational obstacle. (Viswesvaran 1999). In both cases, the idea is that the workplace can cause stress, and resulting anxiety, that can be dealt with by focusing on the problem, becoming informed, and evolve rational thinking. Or the problem can be emotional, and dealt with by emotional regulation techniques. It is not to suggest that any one technique is of more importance, or that it presents a higher efficacy, but that they may be complimentary if used selectively in varying contexts. The focus of the virtual reality aspect of this study primarily focuses on the emotional regulation of stress, with some layers of overlapping benefit to the problem-solving aspect of the topic.

Virtual reality in perspective.

Virtual Reality (VR), or Virtual Reality Experience (VRE) can be described as a situation in which a user is immersed in a responsive, collaborative, or static virtual world. (Berg 2016). Virtual reality can create a world where people can explore an experience without the limitations of viewing perspective or physical possibility. (Wang 2022). Using virtual reality headsets, which are wired or wireless, or computer screen-based experiences, users can interact with a world that can be abstract in nature, or as

realistic as imaginable. This can take the form of immersive VR renditions that are abstract. (Savickaite 2023).

Tackac, et El. Suggest that there is a fundamental positive outcome of virtual reality (VR) tools. The outlined benefit is its' ability to present scenarios that evoke strong emotional responses. (Tackac, 2019).

As we can notice, these definitions, although different, highlight three common features of VR systems: immersion, perception to be present in an environment, and interaction with that environment (Cipresso 2019).

Specifically, immersion concerns the number of senses stimulated, interactions, and the reality's similarity of the stimuli used to simulate environments. This feature can depend on the properties of the technological system used to isolate the user from reality. (Slater 2009).

The literature shows the use of virtual reality in a variety of applications, however, is lacking when it comes to establishing its' use to help with individuals develop coping techniques, and strategies to deal with workplace stress in the unique way proposed by this paper. The literature indicates effectiveness in helping individuals manage stress, even lower it in specific contexts by using decorative visuals. Such visuals make use of appealing, and calming imagery in the form of static photos, drawings, or full motion video. The imagery may be enhanced with audible media, like that used in meditative settings. This paper proposes a unique approach that uses curated, and produced experiences that use full motion narration with human representation of commonly accepted coping techniques.

To add perspective to what virtual reality can be, Weerdmeester, van Rooij and Granic, in their study on the use of virtual gaming to help with general stress coping techniques, found that such technology helps with breathing regulation, and the reduction of stress (Weerdmeester, 2022). Werdmeester, et al. also conclude that 'Overall, individuals who experienced higher self-efficacy, and a stronger internal locus of control were better able to regulate their **anxiety**' (Weerdmeester, 2022).

There is an abundance of literature about the use of virtual reality tools, and technology for entertainment, gaming, training, and pain management, which add credibility to the premise of this study, which is to show that such technology can aide individuals when dealing with workplace stress. In a related study by El-Quirem, et al., 'the findings suggest the importance of integrating virtual reality therapy as an effective intervention to minimize stress, and anxiety' (El-Qirem, 2022)**.** Although the El-Quirem study was focused on the measurement of physiological human elements resulting from the elevation, and deflation of stress on individuals, the validation that virtual reality tools can be of use in the workplace setting is of value. Lim, et at. Suggest that a method to treat anxiety caused by speaking in public is the use of virtual reality (Lim, 2022)**.** The Lim, et al. study also concluded that **'**Overall, VR had a statistically significant effect on reducing public speaking anxiety, which suggests that VR is a useful, and promising therapeutic tool for the treatment of public speaking anxiety' (Lim, 2022)**.**

XY Health provide information bridging virtual reality use with the traditional view of coping with stress by outlining a set of approaches to stress management include the use of validated measures that serve to retrain the brain from adverse thoughts related to the onset of stress, and associated anxiety. Therapies such as

Cognitive Behaviour Therapies (CBT), and Acceptance and Commitment Therapy (ACT) are proven methods that work in a more clinical setting. Some of these clinical settings may result in the prescription of medications that serve to limit hormone production or divert their uptakes (move from one neuron to the other). An article written by XR Health provides this information, and the idea that "Preliminary research has revealed that virtual reality applications can be efficacious tools to help relieve stress, and anxiety. VR therapy is a fully immersive experience that can encourage nervous system regulation – from an anxious fight-or-flight state to a parasympathetic state of calm, and ease. Moreover, it can provide that fun-filled distraction the 'over-thinking brain' may need." (XR Health, 2023).

A study by Arora and Mahapatra asserts that virtual reality is viable for stress management in the workplace. The authors point to research done in the area, however with a limited focus on Asian settings, and in specific workplace contexts. The authors suggest that virtual reality is emerging, whereas this study shows that it is a present, and established medium. The Arora study indicates that the use of virtual reality experiences is successful, within a specific context, when dealing with psychological issues which include stress, and anxiety. The study dives deeper into the application of depression, phobias, and disorders that are not typically entertained by workplace professionals. (Arora 2022).

In a broad study at the National Health Service (UK), author Adhyaru employed decorative scene based virtual reality experiences to help heal workers cope with stress levels. The findings proved the effectiveness of the experiences to mitigate stress, and associated anxiety within that specific setting. The author reports that "following the VR

experience, participants reported significantly increased feelings of happiness and relaxation, and significantly decreased feelings of sadness, anger, and anxiety. Further, the experience was associated with a significant reduction in heart rate." (Adhyaru 2022). The study further summarized that participants had elevated levels of acceptance of the tool, even with various affinities, or knowledge about the tools.

These ideas may present to be sympathetic with the focus of this paper, and provide varied perspectives about the attitudes, and motivations of participants to receive virtual reality as a tool, and the suitability of the experiences as produced. The study also uses a more developed, curated, and scripted set of experiences, as opposed to decorative or imagery-based ones used by several studies. Many virtual reality experiences use gamification, and neutral, calming imagery to cause the reduction of stress related symptoms. In a review by McDougall, he suggests that "Regardless of these facts, gamification in the context of health, and wellness as well as the use of gamification aspects in apps targeting health behavior change has only been rarely investigated so far.". (McDougall 2017). This study also changes the focus of audible stimulations to be secondary in nature, to the developed visual narrative-based experiences.

2.3. Inclusion Criteria

The literature review was framed to include any published works that provide evidence in support of or serve to invalidate aspects of this study. Specifically, literature that related to workplaces, stress, coping with stress, virtual reality and differences thereof based on contextual elements was sought. Although peer-reviewed works were

searched, other works of interest that add definition to the idea have been vetted and included for the benefit of the reader.

As the literature review was being researched and documented, associated works provided more points for discussion that were not planned by the author, or were out of his knowledge base. Through this matrix approach to literature research, the author has become more enlightened about how broad the topic can become and has allowed him to provide more depth to the findings and recommendations for future research.

Through the process of developing the literature review, the author has also discovered more about the potential and limitations of the research topic and has navigated his work accordingly.

2.4. Conclusion

The literature review has helped to define workplace stress, the effects it can have on productivity, and the extent it is evident with the global workforce. The review also outlines the idea of stress, how it manifests into human reality, and the way in which it impacts people in the workplace, with a general connection to daily life.

The use of technology to mitigate stress levels is not a new concept. The literature review provides insights into the extent to which various technologies can be used to manage stress, including virtual reality. There is also an evident gap in the literature connecting, specifically, the use of virtual reality experiences in the workplace. Although existing literature provides insights into the use of virtual reality tools to aid in the management of anxiety, and stress in a more clinical setting, the association with the workplace requires more in-depth research. Further to this, existing literature provides information about the use of decorative imagery, and audible media within the virtual reality experience. This study presents a different, and unique model. The model makes use of full motion video elements with the narration of commonly accepted stress coping techniques. The development of this unique virtual reality experience employs reality headsets, in addition to access by traditional screens.

This innovative research study further defines the idea of virtual reality experiences within a unique design, and serve to fill the gap in existing literature. The study also outlines the extent to which workplace stress is present, and the modes it manifests. Further work provides data about the attitudes, and motivations of people participating in a specific workplace towards the efficacy of virtual reality in mitigating stress levels. With a view of generalized perceptions of stress, the study informs that

virtual reality is a viable tool used to help individuals cope with stress, in any way that they define it, including the potential effects of it to the organization, and person.

CHAPTER 3 - METHODOLOGY

3.1. Introduction

The design of the methodology is to serve the main goal – to determine if virtual reality experiences aid with the mitigation of workplace stress. A secondary goal is to establish context elements to help define workplace stressors, and their impact. Context is supported by the detailed literature review.

This research study utilizes primary research in an applied manner. Quantitative measures are employed to establish benchmarks of comparison between pre-exposure to the solution, and post exposure attitudes, and perceptions. The research is experimental in nature, with supporting descriptive information. Some elements of qualitative measures are used to gather data about contextual, and defining elements in order to establish solution-oriented knowledge. The exploratory nature of the study is supported by the methods utilized, and complemented by elements of explanatory research to help establish context. The exploratory method is utilized due to a lack of secondary data available.

In order to establish and define workplace stress, participants perception of it and institutional contexts and availability of coping mechanisms, a survey was administered to a larger sample population. This survey (Appendix D) represents participation by a sample not to exceed 100 and serves as a foundational information gathering instrument.

A survey (Appendix E) was administered prior to the exposure to the virtual reality experiences. A survey (Appendix F) was administered after exposure to the virtual reality experiences. In the pre-exposure survey, initial questions are designed to

gather knowledge about basic demographics about the participant, void of any unique identifiers. More detailed questions are used to gather information about how the participant defines stress, what their perceptions are about stress in the workplace, and general elements related to classification. In the post-exposure survey, participants are asked about their experience with virtual reality, how their stress level, and attitudes towards stress were impacted, and views about further use of such technology for the intended purpose.

This study was conducted from January to February 2024. The sample participant population was be taken from small to mid-sized organizations, with total participants not exceeding 16 individuals. The context of the study is limited to enterprises operating in the Canadian business environment, however, suggests applicability that is global in nature.

The topic offers relevance to benefit the current business landscape, and is void of novelty due to its applicability to real-world situations. Future studies can benefit businesses, and others, by offering validated data on how to further the framework for the production of virtual reality experiences, and how it can be deployed in the context of the workplace, and other areas of society, including education, healthcare, and a general public health setting.

3.2. Research Design

As outlined in the subsections below, the design of this research study is sound and respects accepted protocol. Using primary data collection methods, the study serves to establish a foundation of knowledge of the topic from a large sample population of 100

participants. The foundational data is taken from an individual perspective and is associated with specific industry and occupation types. Information about the extent to which workplace stress is recognized, availability of programs to help with it and other institutional demographics is collected to form a base for analysis, comparison and discussion. Further to this, the study uses experimentation to gather primary data from a smaller group of 16 participants. The experimentation part of the study serves to gather insights into the efficacy of virtual reality experiences to mitigate workplace stress.

3.3. Population and Sample

Due to the nature of the study, two groups of participants were sampled from a general population in a random format. Although elements of the sample were due to convenience, the resulting groups are representative of a general population who would be characterized by those who would be appropriate for the study, mainly being employed individuals who can provide evidence related to workplace stress and the effectiveness of techniques used to cope with it.

It should be noted that the somewhat related convenience aspect of sampling for this study is a result of the network the author has access to. This network represents those that work outside of a hands-on labour workforce and are predominantly work in service settings that involve some level of people management.

The study findings are based on data collected using two survey instruments.

1. The general Workplace Stress Pulse Survey,
2. The Pre and Post Virtual Reality Exposure Survey.

The first survey used a broader sample group, where a survey was sent to 500 or more people with a resulting sample participant group of 100. This target group represented mostly people in the service sector, with a majority engaged in a people management occupation. Analysis of the industry and occupation types reported by the participants indicate an appropriate representation for the purposes of this study.

The second survey is comprised of a pre-exposure and post-exposure to virtual reality experiences form. This survey set was administered to a more specific and non-random group that were representative of those who have some knowledge of virtual reality and some who do not (approximately 50% for each category). The sample group represents 16 individuals who have fully participated in the virtual reality exposure procedure.

3.4. Data Collection Instruments

This study used survey methods to collect data. Data collection occurred by using two separate survey instruments.

1. The general Workplace Stress Pulse Survey,
2. The Pre and Post Virtual Reality Exposure Survey.

Survey data was collected in digital format using the secure Microsoft Forms platform.

3.5. Procedures

In order to gather base information about the nature of workplaces stress, institutional resources, individual perception of it and institutional context, an initial

survey was administered. This initial survey procedure was conducted well in advance of the exposure to virtual reality experiences. The data collected from this initial, general survey serves to establish definition and an understanding about the topic, and inform the virtual reality experience exposure procedure. 100 participants make up the sample.

After the initial survey data is analyzed, a pre-exposure to virtuality reality experiences survey was administered to a sample of 16 individuals. This survey serves to collect data related to some demographics about the participant in addition to knowledge about workplace stress, perceptions of and requires the identification of a stressful situation.

Participants were then be required to experience one of 6 virtual reality experiences. The exposure involved one of two delivery modes;

1. Exposure using a dedicated virtual reality headset (Appendix G),
2. Exposure using a desktop computer and web browser with silencing headphones (Appendix G).

Exposure to either mode of delivery required the participant to think about a stressful situation, put the silencing headset on, with calming music playing for 30 seconds, then select one of 6 virtual reality experiences (Appendix G). The experience length ranges from 1 minute to 2 minutes 10 seconds, depending on the one chosen.

Immediately after the exposure is complete, participants complete the post-exposure survey and as asked about any change in stress levels and how the experience can be improved.

Data from all surveys are imported into a spreadsheet tool (Excel) and tabulated using the statistical and pivot table functionality. Charting features are used to generate graphical representations of the date for inclusion in this thesis document.

3.6. Data Analysis Limitations

Limitations related to the analysis of data are not present, as the sample sizes used for the general and specific exposure surveys is appropriate to the study. Testing of data against a comparator is not possible due to availability and the design of the research. Greater depth of analysis related to some questions have proven to be difficult due to the generality of the question and limited response range from the participant. As an example, the question “My organization takes workplace stress seriously & has programs in place to help me.”, can be interpreted in many ways by the participant and is dependent on personal experience, connection with the organization and the presence or lack of a standard comparator. The lack of specific definition of the concept of workplace and the measure of seriously can lead to more non-committed or neutral responses from the participant. The author has assumed a neutral perception of what an organization does or can do with regards to this question. As another example, the question “Workplace stress influences my at-home life (including relationships).”, can be interpreted in varying ways by the participant as the concept of home-life and relationships has not been defined or standardized.

3.7. Ethics Related to Human Subject Participation

During the course of investigation and experimentation on a sample of 16 participants, all ethical considerations related to research have been observed. Using the Seneca Polytechnic Research Ethics Board guidelines and respecting the Tri-Council Policy Statement (TCPS 2: Core-2022) of the Panel of Research Ethics (Canada), the study is free from prejudiced participation. (Panel on Research Ethics, 2022). A Letter of Information and Consent has been provided to each participant before they agree to participate and an offer to gain access to the final results made. All willing participants are 18 years old or older as this is respectful of the Canadian age of majority guidelines.

3.8. Summary

This research study is designed with respect to strong research ethics and in line with accepted practices for graduate thesis work. All declarations related to methodology, data and findings are made clear in this report. The methodology uses an appropriate mix of mainly quantitative analysis and adds the benefits of some quality assessments where required. Probability sampling techniques were used to determine the participant population for the general exploratory survey. Some selective non-probability sampling for the pre and post exposure surveys, as the unique nature of the technology and environmental considerations made it appropriate.

The data has proven validity through the use of common testing procedure and is appropriate for the conclusions. The procedure for the study respected time-lines,

environmental factors and served to answer the questions required for this study. The study, through sound design, has achieved face validity as it asks questions that are necessary and not distracting from purpose. Statistical validity is achieved, as the sample sizes are appropriate and provide responses form a varied and representative population. External validity is present, however has the limitation of the sample being from a network of somewhat similar people (service occupation oriented). This limitation is balanced by the fact that participation is broad in terms of industry groups, industry size and years in a profession. The question sets for each of the surveys are respectful of content and, as such, have establish related validation.

CHAPTER 4 – RESULTS

4.1. Introduction

Supported by the sound methodology (3.1), the results provide an insight into the efficacy of the use of virtual reality technology to mitigate workplace stress. In this section, evidence about the extent to which workplace stress exists, its' quality and nature, as well as attitudes towards it from a variety of views is presented. The understanding of participants about coping mechanisms and the use of virtual reality are also explored. These general and exploratory metrics gain data from the Workplace Stress Pulse Survey Data Collection Survey (Appendix D).

Two additional surveys were conducted to provide evidence to support or negate the positive impact of virtual reality technology to aide with workplace stress. The VR Experience Pre-Exposure Survey (Appendix E) and the VR Experience Post-Exposure Survey (Appendix F) were used to test the understanding of workplace stress, extent to which it exists and at what level and existing coping mechanisms. The Pre-Exposure survey was used to gain insights into the current state of knowledge and coping methods. After exposure to two modes of virtual reality stress management tools, the post-exposure survey serves to understand the extent to which stress levels have changed and perceptions or attitudes towards it have shifted.

The results, as shown in the Findings (4.3) section provide in-depth evidence to support the literature review, hypothesis and the overall idea that tools such as virtual reality may help with workplace stress mitigation. This last point is discussed further in the future implications section.

4.2. Organization of Analysis

Using the data from the three surveys;

1. Workplace Stress Pulse Survey Data Collection Survey (Appendix D),
2. VR Experience Pre-Exposure Survey (Appendix E),
3. VR Experience Post-Exposure Survey (Appendix F).

Data has been tabulated into graphical and tabular formats, as presented in the Findings (4.3) section. The discussion of results is presented in two sections.

The first section serves to allow the reader to see how the results relate to the research questions. This section provides findings from a more specific and focused population of 16 participants. This sample of willing participants have been exposed to virtual reality experiences to help cope with stress. The data gathered in the pre-exposure survey provides specific evidence about three areas;

1. Demographics about participants, and characteristics about their employer organizations,
2. Causes of workplace stress, programs in place by organizations to help with it, and coping methods used,
3. Influence of workplace stress on at-home life,
4. Stress level experienced in one specific situation prior to exposure to virtual reality experiences.

After the specific and focused population were exposed to one of two modes of virtual reality stress reduction experiences, a post-exposure survey was administered. This follow-up survey serves to gather information about;

1. The extent to which exposure to virtual reality experiences helped to reduce stress level (based on one specific situation),
2. If the participant would recommend virtual reality experiences to be adopted by their organizations,
3. Changes to the virtual reality experiences, and delivery as recommended by the participant.

Further to the presentation of the data, concluding and summative analysis is provided to provide evidence to support or negate the hypothesis.

The second section presents the findings from the general Workplace Stress Pulse Survey. This survey has the purpose of gathering evidence from a general population of participants. Such evidence is focused on understanding the nature of workplace, as reported by the participants, the programs offered by their institutions to help them and data about their involvement in their profession and information about their organization type. Findings from this survey are supported by reviewed literature where appropriate and commentary from the researcher.

The second section provides general information about;

1. The demographics of participants, and characteristics about their employer organizations,
2. Current level of workplace stress experienced by participants,

3. Causes of workplace stress, programs in place by organizations to help with it, and coping methods used,
4. Influence of workplace stress on at-home life.

4.3. Findings

4.3.1 Data Testing, and Validation

Collected data has been processed, and managed using the Microsoft Excel spreadsheet software. The pivot table functionality within the Excel environment has been utilized for data mining, and generating graphical representations of the data.

Statistical data management has been performed using the IBM SPSS (Statistical Package for the Social Sciences software tool. This testing has been performed on the pre-exposure stress score as compared to the post-exposure stress score (Table 4.3.2-1). Redundant testing of the results obtained from SPSS were verified by using the Microsoft Copilot tool. Both SPSS and Copilot produced the same results. Presentation, and discussion of the validation analysis follows;

Table 4.3.1-1 Preliminary Metrics

Metric	Pre-Exposure	Post-Exposure
Mean	6.06	2.81
Median	7.00	2.50
Standard Deviation	2.05	2.21

The change in mean from 6.06 to 2.81 indicates that the values decreased significantly from pre-exposure to post-exposure stress levels.

The gap between the pre and post-exposure values is ~ -3.25. This indicates a significant change in the variable being measured (if virtual reality experiences help reduce stress levels). To support this, the calculated **effect size** using Cohen's d to establish the practical significance of the change observed. An effect size of ~ -1.52 is calculated. This metric indicates a substantial change between the pre and post-exposure values.

The median value changes from 7.00 with the pre-exposure data to 2.50 with the post-exposure data. This observation is consistent with statistical significance and in support of central tendency of the data.

Standard deviations for the pre-exposure (2.05), and post-exposure (2.21) data indicate that the variability spread is highly comparable. This small shift indicates validity, and confidence in the data (as reported by the same participant population).

Using T-Test analysis, the mean difference between the pre-exposure, and post-exposure data indicate a notable, and significant decrease (T-Statistic of 3.8060). The t-Statistic value is very high, showing a strong difference between the pre, and post values. The associated P-Value (0.0017) is very low, with a statistically significant result indicating that the data were not by chance, and with affect from the intervention applied (exposure to virtual reality experiences). The P-Value is < than the significance level

(Alpha $\alpha = 0.05$), which allows us to determine that the null hypothesis is rejected. This establishes validity of the data and serves to support the findings.

Statistical analysis of the data indicates a highly significant decrease in stress scores from the pre-exposure survey, to the post-exposure survey. A high t-statistic score, and a relatively low p-value score indicate elevated evidence that is not in favour of a null hypothesis. This adds confidence in the results in support of the hypothesis, and confirms that the reduction in stress level from pre-exposure to post-exposure is unlikely due to random chance. The practicality of these observations is that the data supports the efficacy of the use of virtual reality experiences to help reduce workplace stress.

4.3.2 Findings – Section 1 - Pre and Post Exposure to Virtual Reality Experiences

This first part of the findings section outlines the results of the specific, and focused surveys administered to participants who were exposed to actual virtual reality experiences. The data provides insights about;

- Stress levels before exposure to virtual reality technology,
- How significantly stress levels changed after exposure to virtual reality technology,
- Participant demographics,
- Prior knowledge about or exposure to virtual reality technology,
- How exposure to virtual reality experience technology changed stress levels,
- How strongly a recommendation would be made by the participant for their organization to adopt such technology.
- The types of organizations participants work for
- The nature of their occupation,
- Perceived causes of workplace stress,
- Mechanisms and programs available to cope with such stress (institutional level),
- Specific effects of such stress.

This section begins with results supporting the foundational question – if virtual reality experiences help to reduce stress levels. The initial discussion is followed by presentation of data and narrative to gain insights into patterns related to demographics, size and type of organization and occupation.

Data is presented in graphical format, followed by a data table representation and analysis narrative.

Figure 4.3.2-1 Change to Stress Level Pre and Post Exposure to Virtual Reality

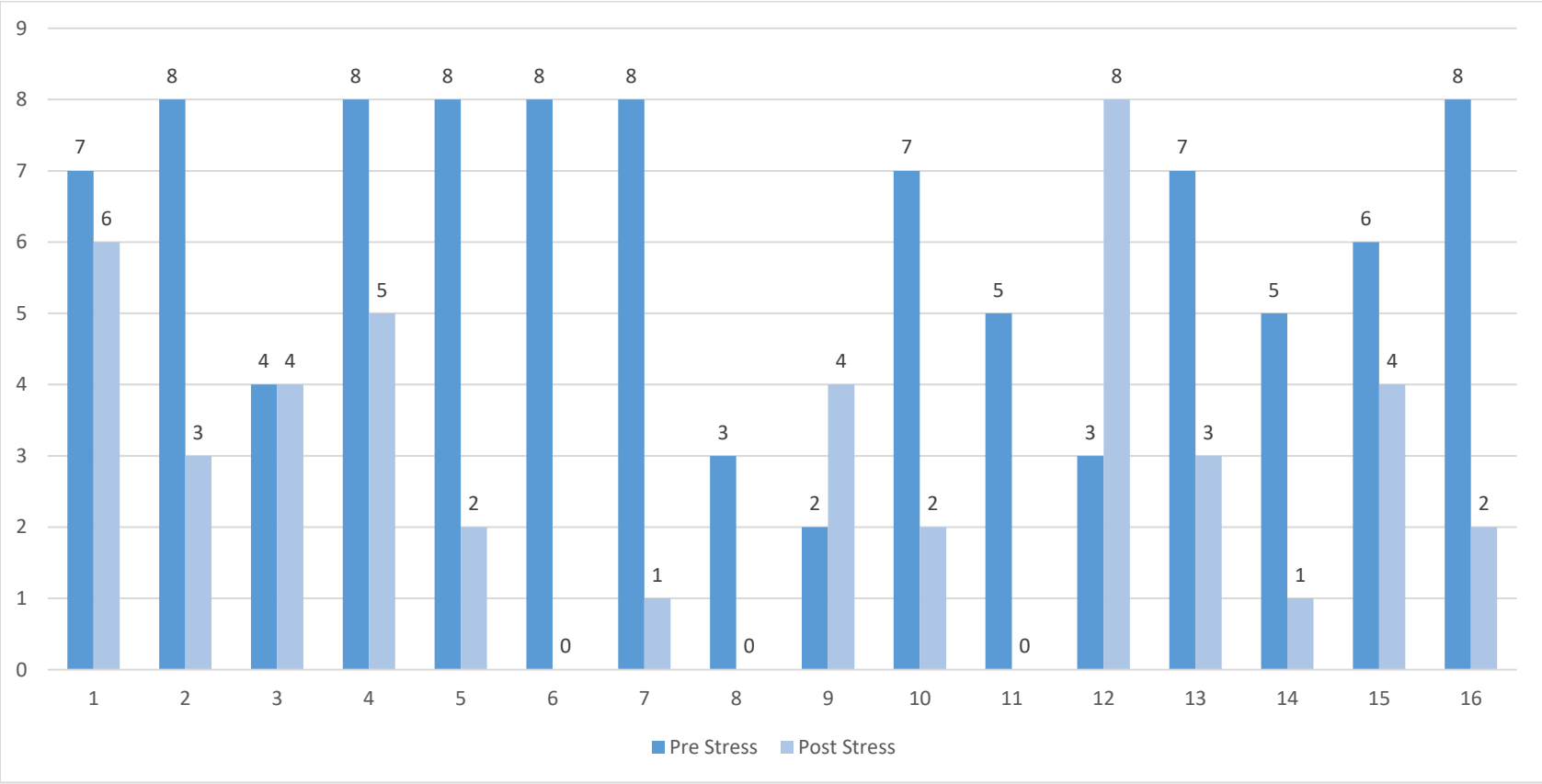

Table 4.3.2-1 Change to Stress Level Score Pre vs. Post Exposure to Virtual Reality

Participant	Pre-Stress	Post-Stress
1	7	6
2	8	3
3	4	4
4	8	5
5	8	2
6	8	0
7	8	1
8	3	0
9	2	4
10	7	2
11	5	0
12	3	8
13	7	3
14	5	1
15	6	4
16	8	2

The foundational question of this study is to determine if virtual reality experiences can aide in the reduction of workplace stress. The results in this section indicate that it can. With 13 (81.25%) participants, stress levels reduced after exposure to virtual reality experiences. In 2 (12.50%) cases, stress levels increased, and 1 (6.25%) case indicated no change in stress levels. Where participants indicated an increase in stress levels or no change at all, they reported an average score of 7.67 (out of 10) when asked if they would recommend adoption of VR to their organizations. This result indicates a structural issue with the delivery of the virtual reality experiences and the resulting effect on stress. The data from those indicating improvements in stress levels after exposure to VR provides conclusive evidence to support the hypothesis.

Appendix G provides detailed information about the virtual reality experiences, production workflow and technology used. In general, after completing the pre-exposure survey, participants were exposed to the experiences using a dedicated Oculus Go headset, whereas others were exposed to the experiences via a desktop computer with noise baselining headphones. All exposures were administered in a quiet room, with comfortable and neutral surrounding, and free from external influences.

In the pre-exposure survey, participants were asked to think about a stressful situation at their workplace or other context. Participants were asked to score their stress level on a Likert scale of 0-10 (0 being the lowest level). In the post-exposure survey, participants were asked to rate their stress levels on a Likert scale of 1-10 (0 being the lowest), based on the stressful situation from the pre-exposure survey. Table 4.1 provides the findings about the pre and post-exposure scores for this question.

Figure 4.3.2-2 Average Participant Score for Stress Level Pre vs. Post Exposure to Virtual Reality

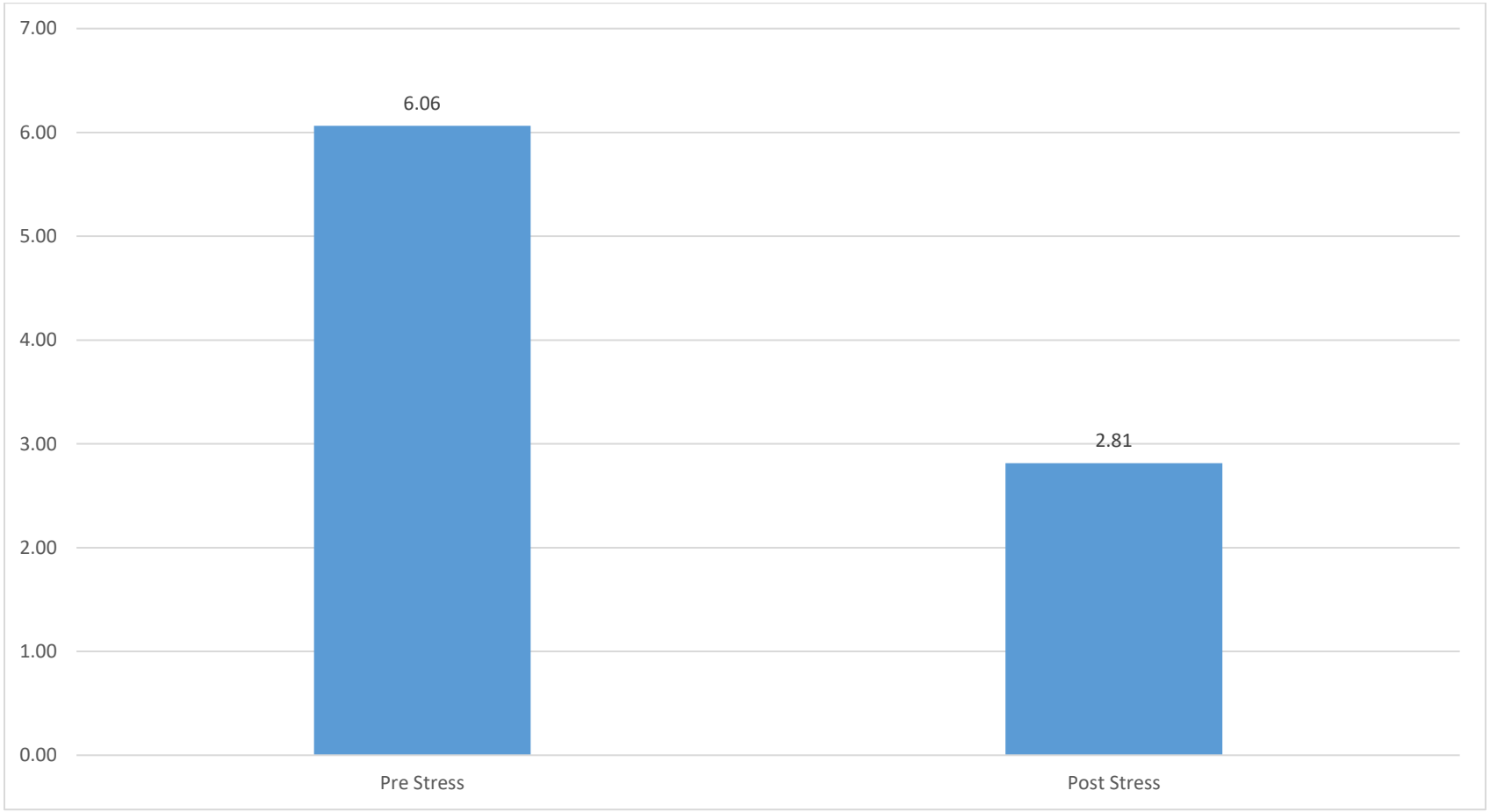

Table 4.3.2-2Average Participant Score for Stress Level Pre vs. Post Exposure to Virtual Reality

n	Pre-Stress	Post-Stress	% Change
16	6.06	2.81	-53.61%

In support of the foundational question, the data indicate a significant improvement in stress levels after exposure to the virtual reality experience. Participants reported an average score of 6.06 (out of 10) prior to exposure, and a shift to an average score of 2.81 (out of 10) after exposure. The result is a change of -53.61%.

Chart 4.3, and Table 4.3 indicate a similar result when the median scores are compared. Participants reported a median stress level score of 7.00 (out of 10) prior to exposure to the experiences. This median score reduced to 2.50 (out of 10) after participants were exposed to the virtual reality experience. This results in a significant change of -64.29%.

Figure 4.3.2-3 Median Participant Score for Stress Level Pre vs. Post Exposure to Virtual Reality

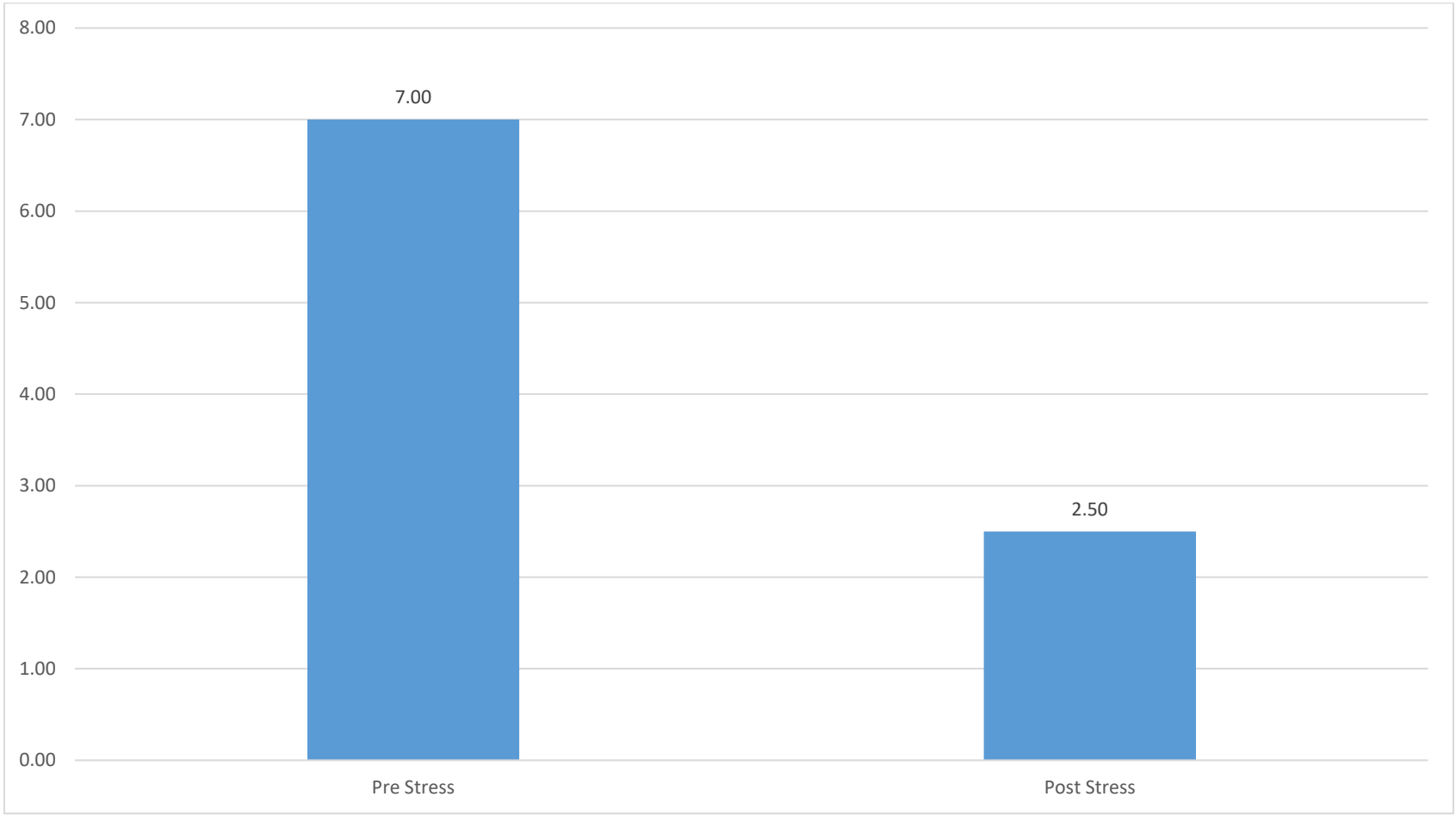

Table 4.3.2-3 Median Participant Score for Stress Level Pre vs. Post Exposure to Virtual Reality

n	Pre-Stress	Post-Stress	% Change
16	7.00	2.50	-64.29%

Figure 4.3.2-4 Average Scores by Score Ranges for Pre vs. Post Exposure to Virtual Reality

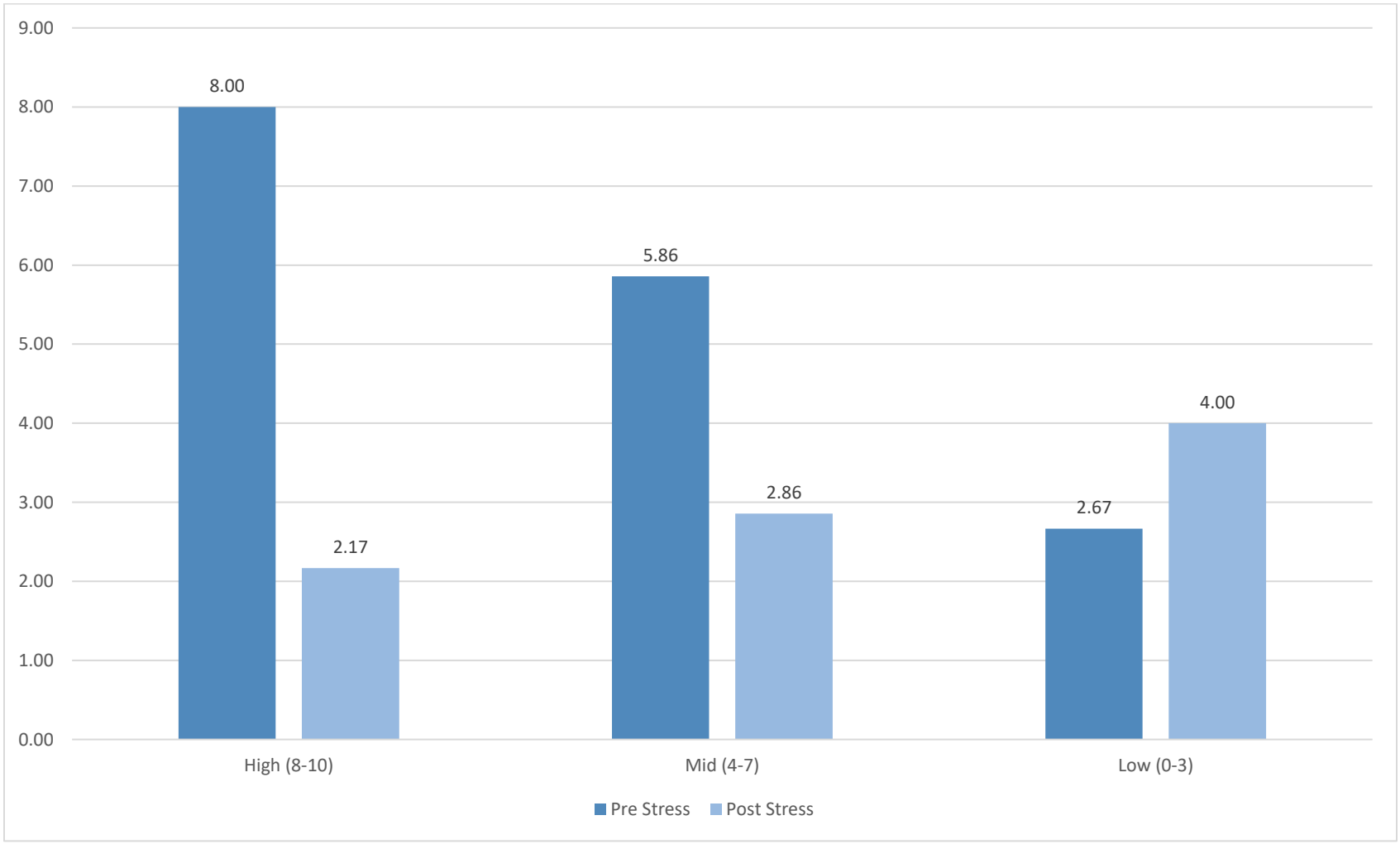

Table 4.3.2-4 Average Scores by Score Ranges for Pre vs. Post Exposure to Virtual Reality [1]

	n	Pre-Stress	Post-Stress	% Change
High (8-10)	6	8.00	2.17	-72.88%
Mid (4-7)	7	5.86	2.86	-51.19%
Low (0-3)	3	2.67	4.00	49.81%

When scores are grouped into ranges or high, mid or low, the results indicate support for the idea that virtual reality experiences help to reduce workplace stress. Participants who scored mid to high stress level in the pre-exposure survey reported a highly significant reduction in stress levels (an average of 62.04%) after exposure to VR experiences. 3 participants, all in the low score range report an increase in stress levels. A possible reason in the increase for low range is that these participants did not appreciate the delivery of the virtual reality experiences and, were not able to report a favourable level in stress.

Table 4.5 and, Chart 4.5 provide similar information about changes to stress levels when using median scores as indicators.

Data representations following provide insights into changes in stress levels based on participant demographics and, organizational characteristics and, occupations. The representations are explanatory as stand-alone, where commentary is provided where required. All representations are in support of the foundational question and, proves the efficacy of the use of virtual reality experiences to aide in workplace stress reduction.

[1] The comparison is the average stress level score report before exposure to the virtual reality experiences and the average score after exposure – using the same participants for each range of scores.

Figure 4.3.2-5 Median Scores by Score Ranges for Pre vs. Post Exposure to Virtual Reality

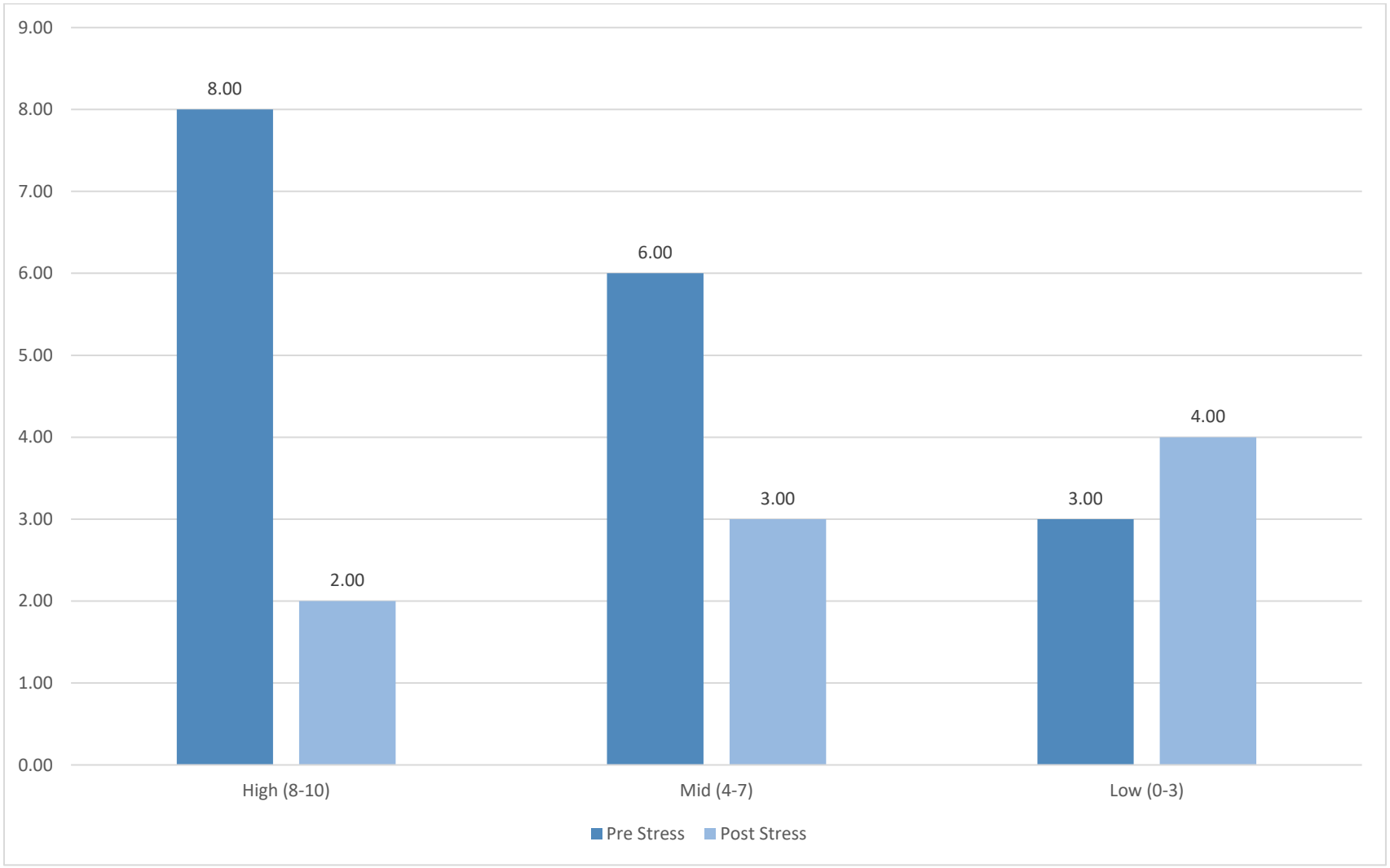

Table 4.3.2-5 Median Scores by Score Ranges for Pre vs. Post Exposure to Virtual Reality

	n	Pre-Stress	Post-Stress	% Change
High (8-10)	6	8.00	2.00	-75.00%
Mid (4-7)	7	6.00	3.00	-50.00%
Low (0-3)	3	3.00	4.00	33.33%

Figure 4.3.2-6 Change in Average Stress Score by Gender

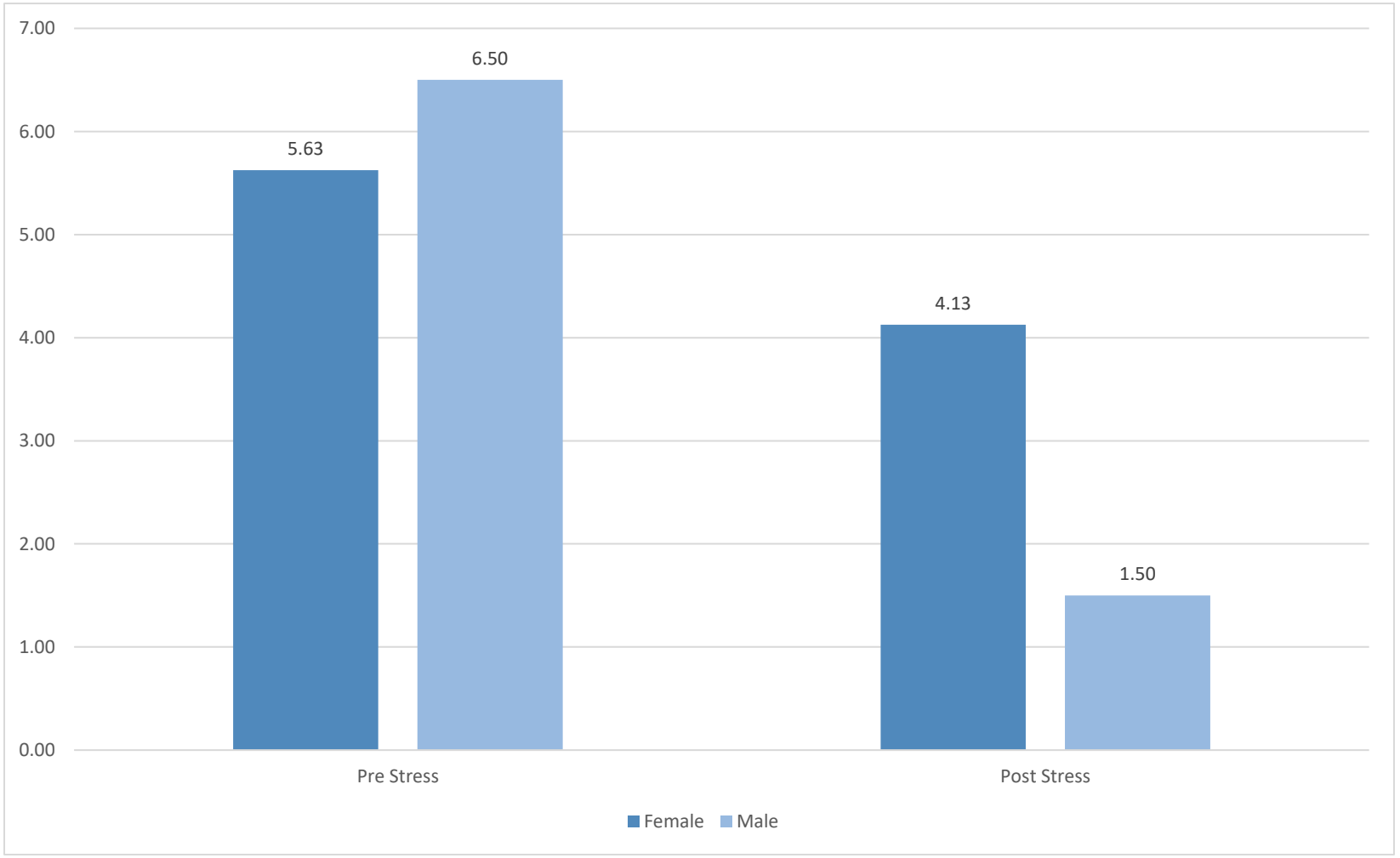

Table 4.3.2-6 Change in Average Stress Score by Gender

Gender	*n*	Pre-Stress	Post-Stress	% Change
Female	8	5.63	4.13	-26.67%
Male	8	6.50	1.50	-76.92%

The data indicates that female participants reported a significantly less reduction in stress levels (26.67%) than male participants (76.92%). This disparity may be explained by how different genders perceive stress and, cope with it. A study by Puranova found that women (females) experiences greater emotional exhaustion than their male counterparts. (Puranova, 2010).

> 'Some research suggests that stressors can be experienced differently by men and, women because of differences not just in perception but also in how they are exposed to stressors, as well as differences in coping.'.
>
> (Fida, 2023).

It is noted that many more studies about the gender difference with perceptions of, and, coping mechanisms used to deal with stress are inconsistent. (Gyllensten, 2005).

It would be of interest to future studies to gather information on the generational changes to the idea that females look at stress differently than males, and, the finding that there might not be a difference. With the nature of

occupational roles, and, the narrowing of the gender gap in terms of the type work being done, may be less disparate with younger people than those from generations who inherit traditional attitudes towards work, and, the roles of females vs. males. Ausburn suggests that 'that males and, females may be differently affected by VR and, that females may be less comfortable, confident, and, capable in virtual learning environments, particularly when the environments are highly technical and, visually complex.'. (Ausburn, 2009).

It should be noted that female participants reported an average score of 8.5 when asked if they would recommend virtual reality technology for adoption to their organization. This is supportive of the idea that the delivery of the experience, and, technology limitations may be the cause of the low stress improvement score.

Figure 4.3.2-7 Change in Average Stress Score by Age

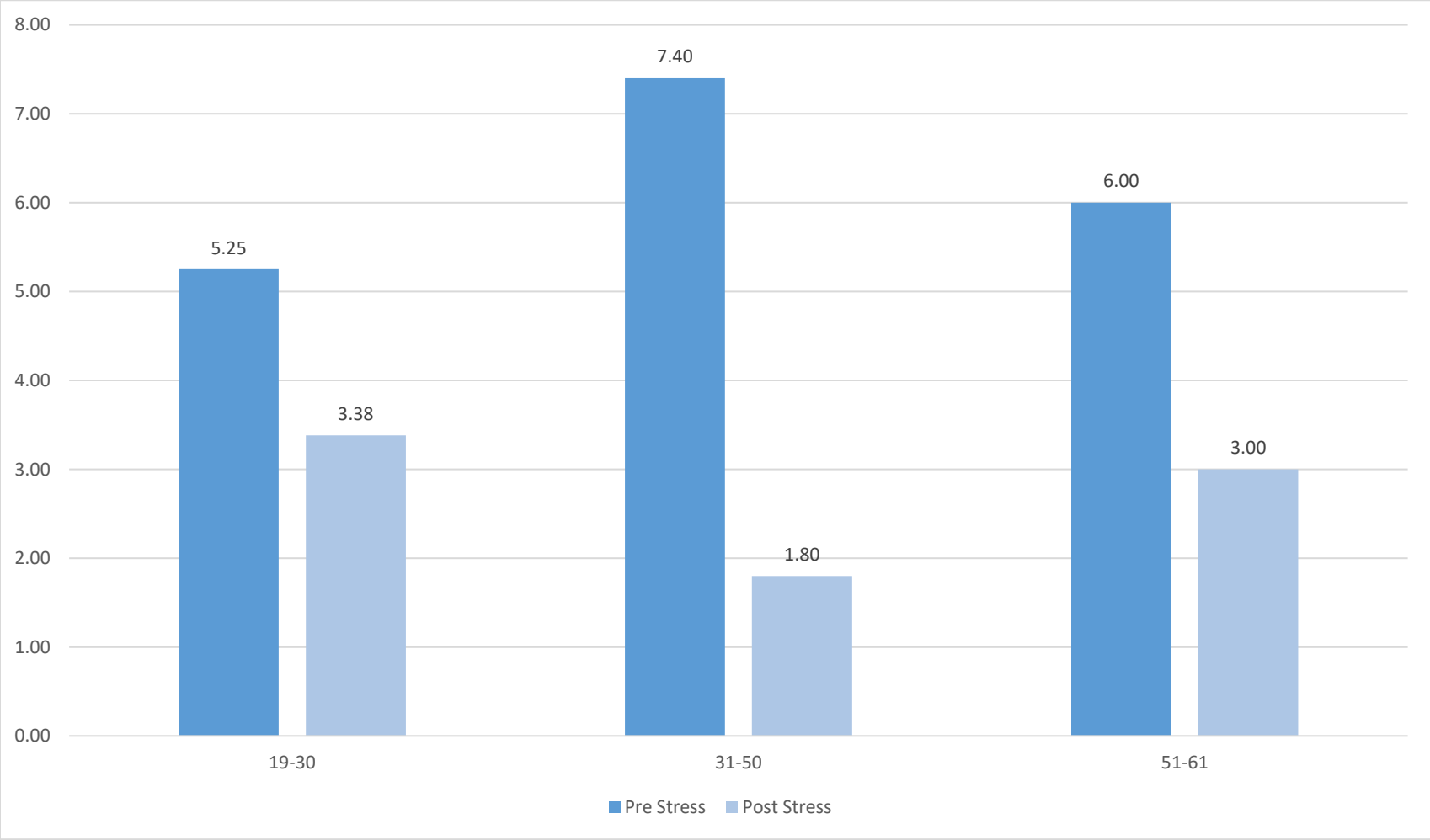

Table 4.3.2-7 Change in Average Stress Score by Age

Age Range	*n*	Pre-Stress	Post-Stress	% Change
19-30	8	5.25	3.38	-35.62%
31-50	5	7.40	1.80	-75.68%
51-61	3	6.00	3.00	-50.00%

When looking at the results by age, the range of 19 to 61 years has been grouped into generational segments. The data indicate consistency among all three groups, with the middle segment aged 31-50 year showing the most improvement in stress levels after being exposed to the virtual reality experiences. It should be noted that individual interaction with the experiment may have influenced this varied response. It can be generalized that a younger participant might have higher affinity with new technology, therefore extract more value from it. The data do not support this generalization. The willingness of different age groups may also have influenced the responses, as varying attitudes towards wanting help with stress, attention to the stimulus or recognizing potential may exist.

Vogels suggests that a younger population, millennials aged up to 38 years, receive technology at a slightly higher rate than those immediately older than them and, substantially more so than those much older. (Vogels, 2019). 'The common misconception is that older adults do not want to use or cannot use technology. But for an increasing number of older adults, this is not true.'. (Pew, 2003). Scott suggests that age differences are not a significant factor when determining how different generations embrace or are willing to accept help with reducing stress. (Scott, 2013).

Figure 4.3.2-8 Change in Average Stress Score for Participants With Prior Exposure to Virtual Reality for Stress Management vs. Participants With No Prior Exposure

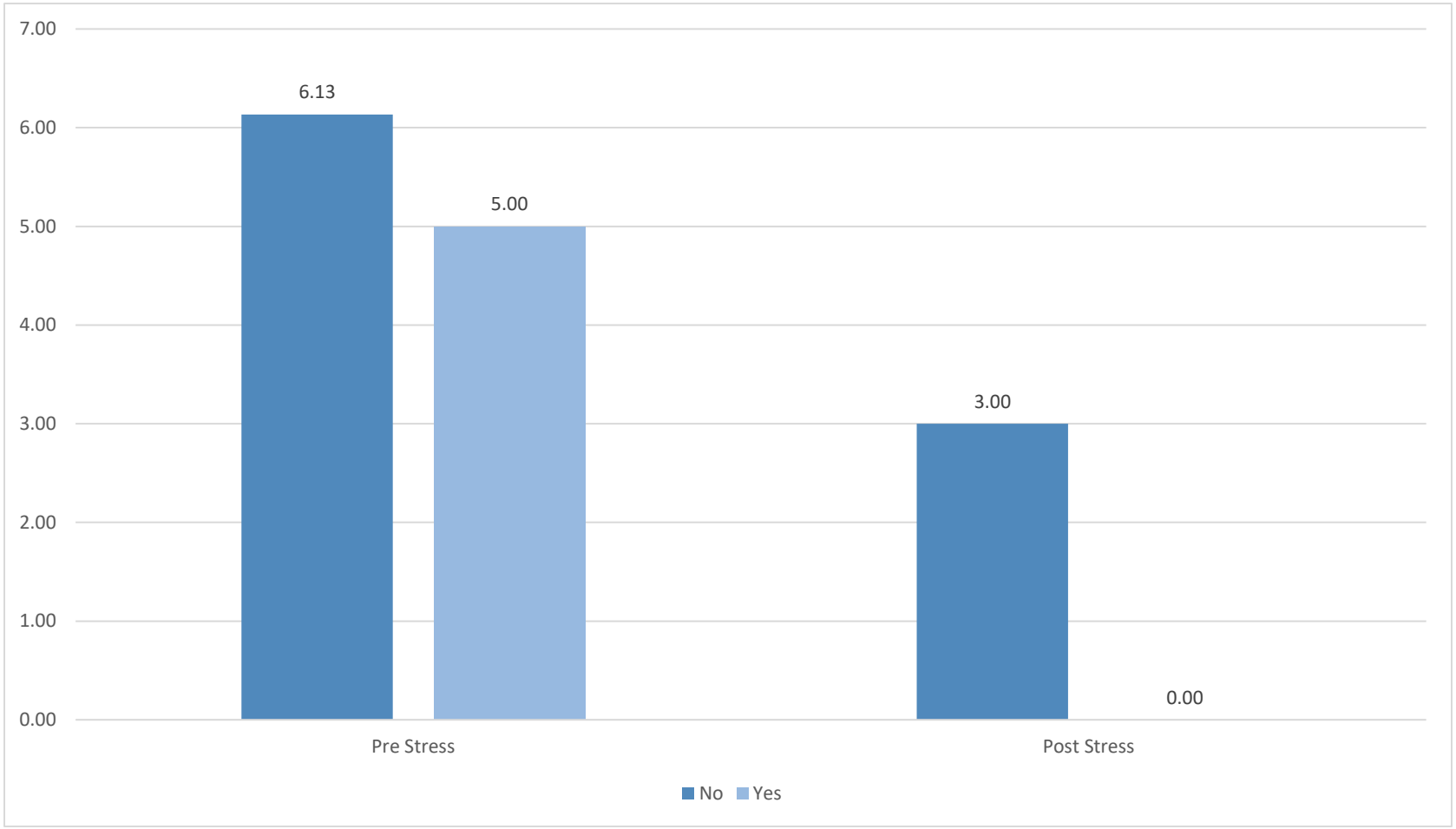

Table 4.3.2-8 Change in Average Stress Score for Participants With Prior Exposure to Virtual Reality for Stress Management vs. Participants With No Prior Exposure

	n	Pre-Stress	Post-Stress	% Change
No	15	6.13	3.00	-51.09%
Yes	1	5.00	0.00	-100.00%

All participants, except one report having no prior experience with virtual reality in relation to stress management. It is of interest that the 1 participant who reports to having prior exposure indicated a 100% reduction in stress levels after exposure to the virtual reality experience. This may be the result of familiarity and, acceptance of such technology. Familiarity with technology often develops in higher affinity with it and, the resultant reporting of the value that it offers. Exposure to technology in the past has been found to have an impact on acceptance adoption. (Jyothychandra, 2022).

Figure 4.3.2-9 Change in Average Stress Score by Highest Education Level Achieve by Participant

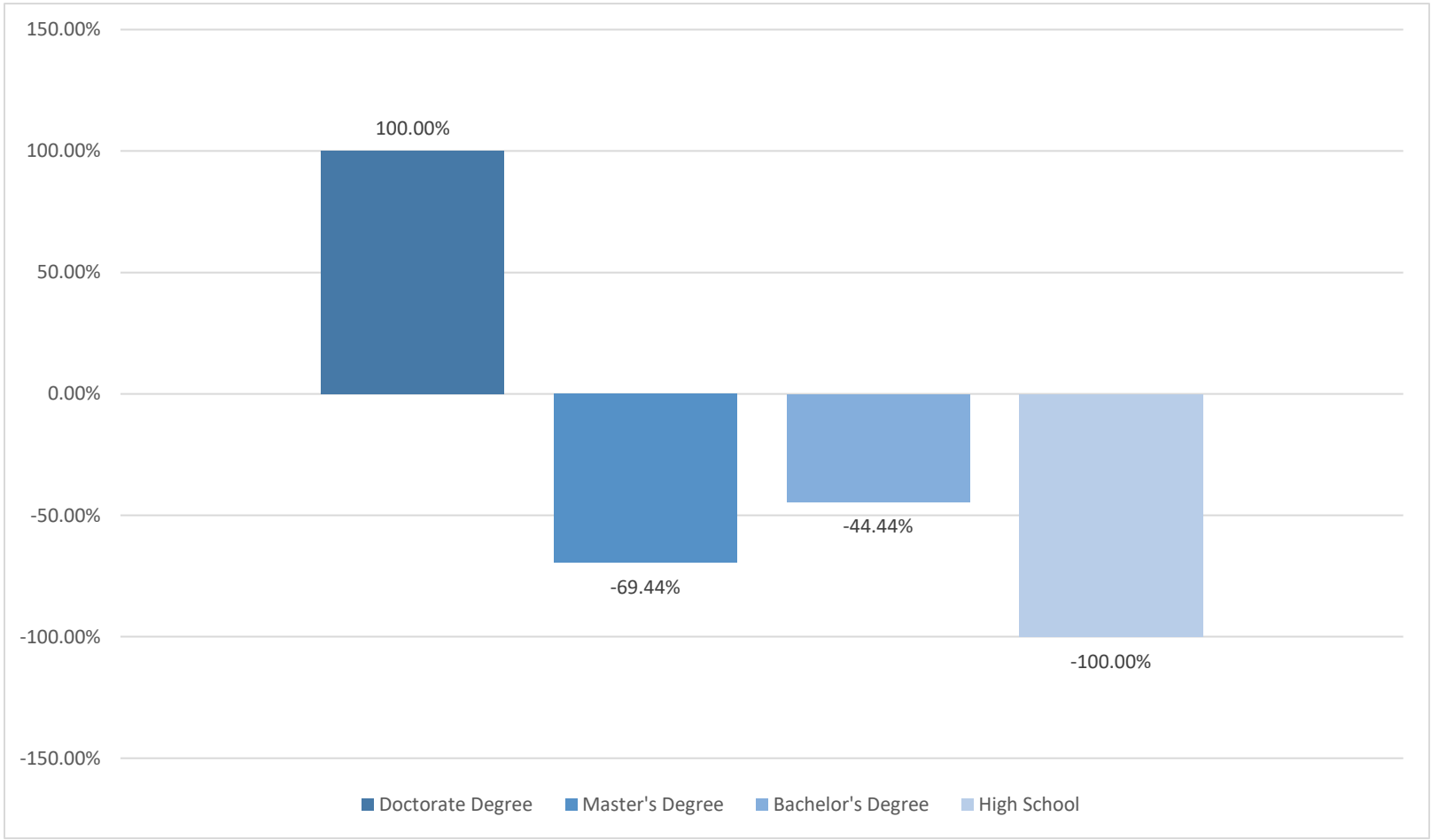

Table 4.3.2-9 Change in Average Stress Score by Highest Education Level Achieve by Participant

Education Level	*n*	Pre-Stress	Post-Stress	% Change
Doctorate Degree	1	2.00	4.00	100.00%
Master's Degree	6	6.00	1.83	-69.44%
Bachelor's Degree	8	6.75	3.75	-44.44%
High School	1	5.00	0.00	-100.00%

It can be stereotyped that individuals with higher levels of education are more learned and, tend to report more favourable acceptance of technology, and, are more savvy in terms of seeing potential benefits, such as helping with reducing stress. Date from a Pew research study indicate that education is an influence on the adoption, and, attitudes towards technology. The study also indicated other influencing factors such as socio-economic status. (Pew, 2004). [2]

The data above indicates that the participant with the highest level of education (Doctorate Degree) indicates a significant increase in stress levels after exposure to virtual reality experiences. This represents the perception of 1 out of 16 participants, and, is most likely related to how the technology delivery took place, and, perhaps the contextual framework of when the study was conducted. Without further data, and, an opportunity of further investigation through interviewing the participant, more insight cannot be added to this result. It should be noted that the vast majority of participants, at other levels of education reported significant improvements in stress levels.

[2] For the purposes of this study, data about socio-economic statis was not collected.

Figure 4.3.2-10 Change in Average Stress Score by Organization Size (Participant Employer)

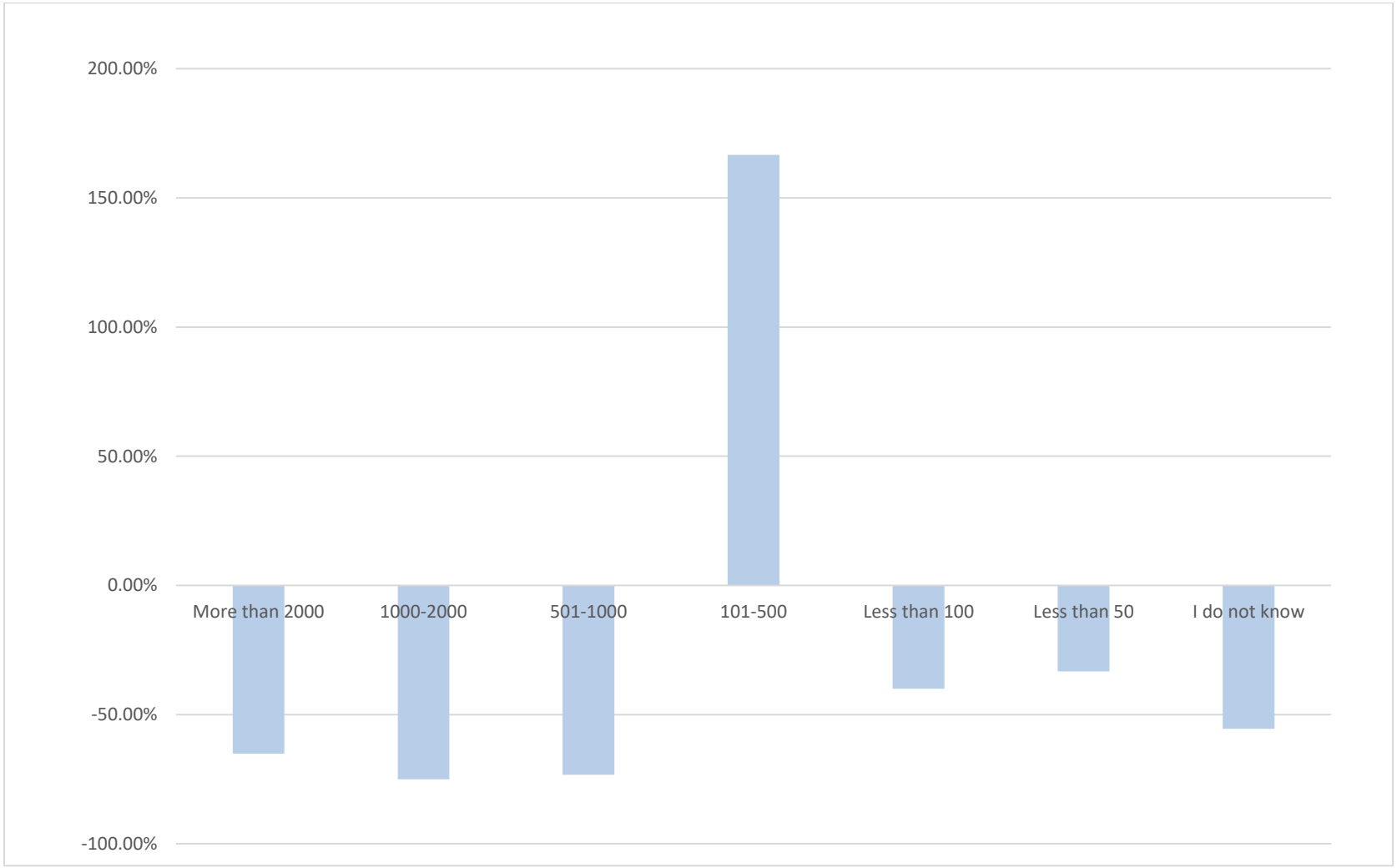

Table 4.3.2-10 Change in Average Stress Score by Organization Size (Participant Employer)

Organization Size	*n*	Pre-Stress	Post-Stress	% Change
More than 2000	6	7.17	2.50	-65.12%
1000-2000	1	8.00	2.00	-75.00%
501-1000	2	7.50	2.00	-73.33%
101-500	1	3.00	8.00	166.67%
Less than 100	2	5.00	3.00	-40.00%
Less than 50	2	4.50	3.00	-33.33%
I do not know	2	4.50	2.00	-55.56%

The data suggest that organization size (participant employer) is not indicative of a pattern of acceptance of virtual reality or an indicator of reduction in stress levels. The data show that 1 participant employed at a smaller organization reported a significant increase in stress levels. This represents the perception of 6.25% of participants, and, is most likely related to how the technology delivery took place, and, perhaps the contextual framework of when the study was conducted. Without further data, and, an opportunity of further investigation through interviewing the participant, more insight cannot be added to this result. It should be noted that the vast majority of participants, at other levels of education reported significant improvements in stress levels.

Although the data supports the idea that participants working for larger employers report the greatest improvement in stress levels, smaller organizations also show favourable scores. It may be that those employed by larger organizations have greater

causes of stress, reported a stressful situation in line with this idea, and, benefitted the greatest from exposure to virtual reality.

Figure 4.3.2-11 Change in Average Stress Score by Responses to ‘My organization takes workplace stress seriously & has programs in place to help me’.

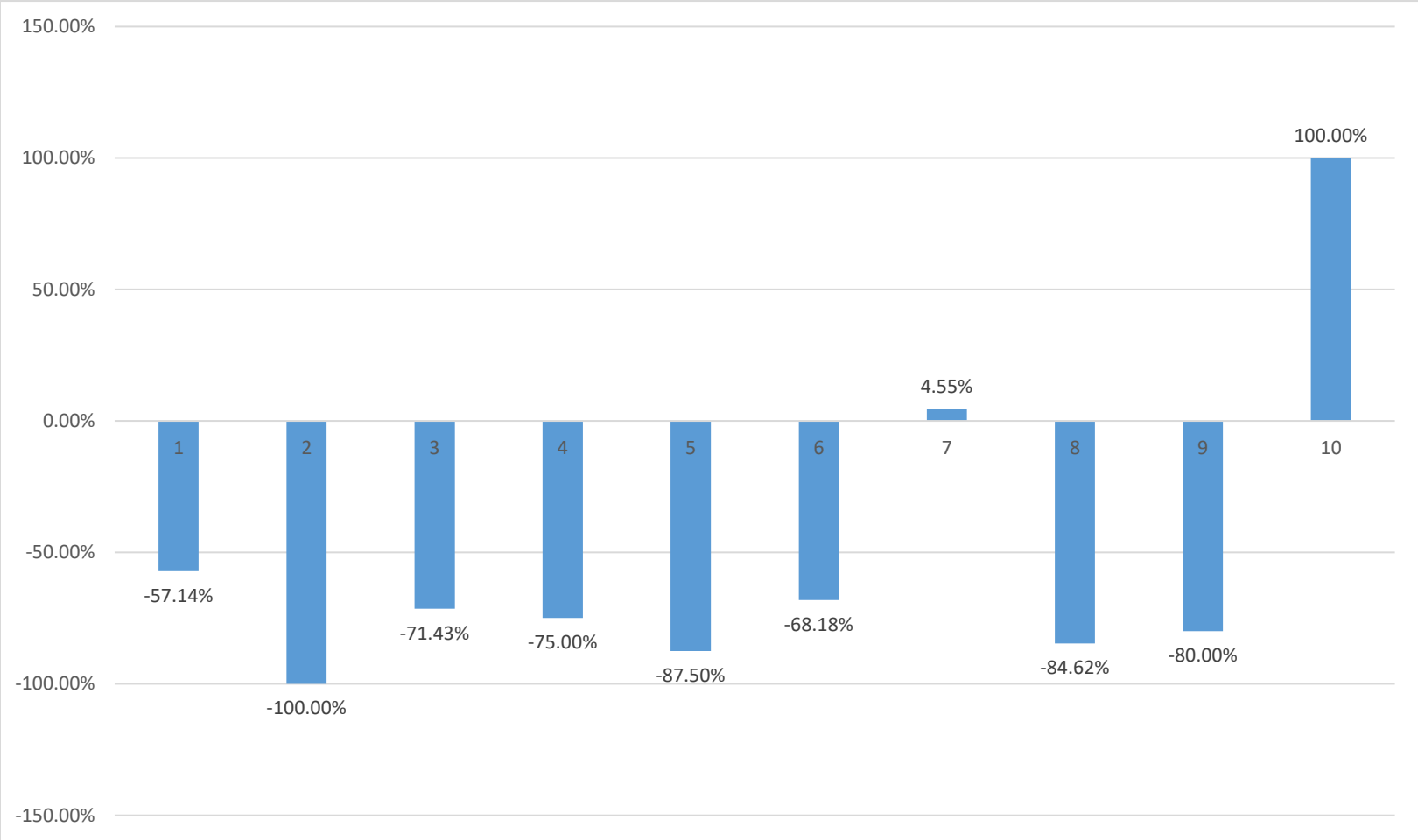

Table 4.3.2-11 Change in Average Stress Score by Responses to 'My organization takes workplace stress seriously & has programs in place to help me'.

Score	n	Pre-Stress	Post-Stress	% Change
0	1	7.00	3.00	-57.14%
1	1	3.00	0.00	-100.00%
2	1	7.00	2.00	-71.43%
3	1	8.00	2.00	-75.00%
4	1	8.00	1.00	-87.50%
6	3	7.33	2.33	-68.18%
7	4	5.50	5.75	4.55%
8	2	6.50	1.00	-84.62%
9	1	5.00	1.00	-80.00%
10	1	2.00	4.00	100.00%

When asked if their organization takes workplace stress seriously, and, has programs to help with it, participants across the board reported a reduction in stress levels. The exceptions being 2 participants who reported increases in stress levels. It should be noted that the 1 participant who consistently reports a significant increase in stress levels after exposure to virtuality reality is most likely doing so due to the delivery of the experiences, and, the context within which they participated. It is difficult to determine this without further investigation. The overall results indicate no correlation between organizational awareness and, changes in stress level scores. The data overwhelmingly support the foundation question.

Figure 4.3.2-12 Average Scores for Responses to ‘I would recommend that my organization use VR experiences to help with stress (anxiety)’.

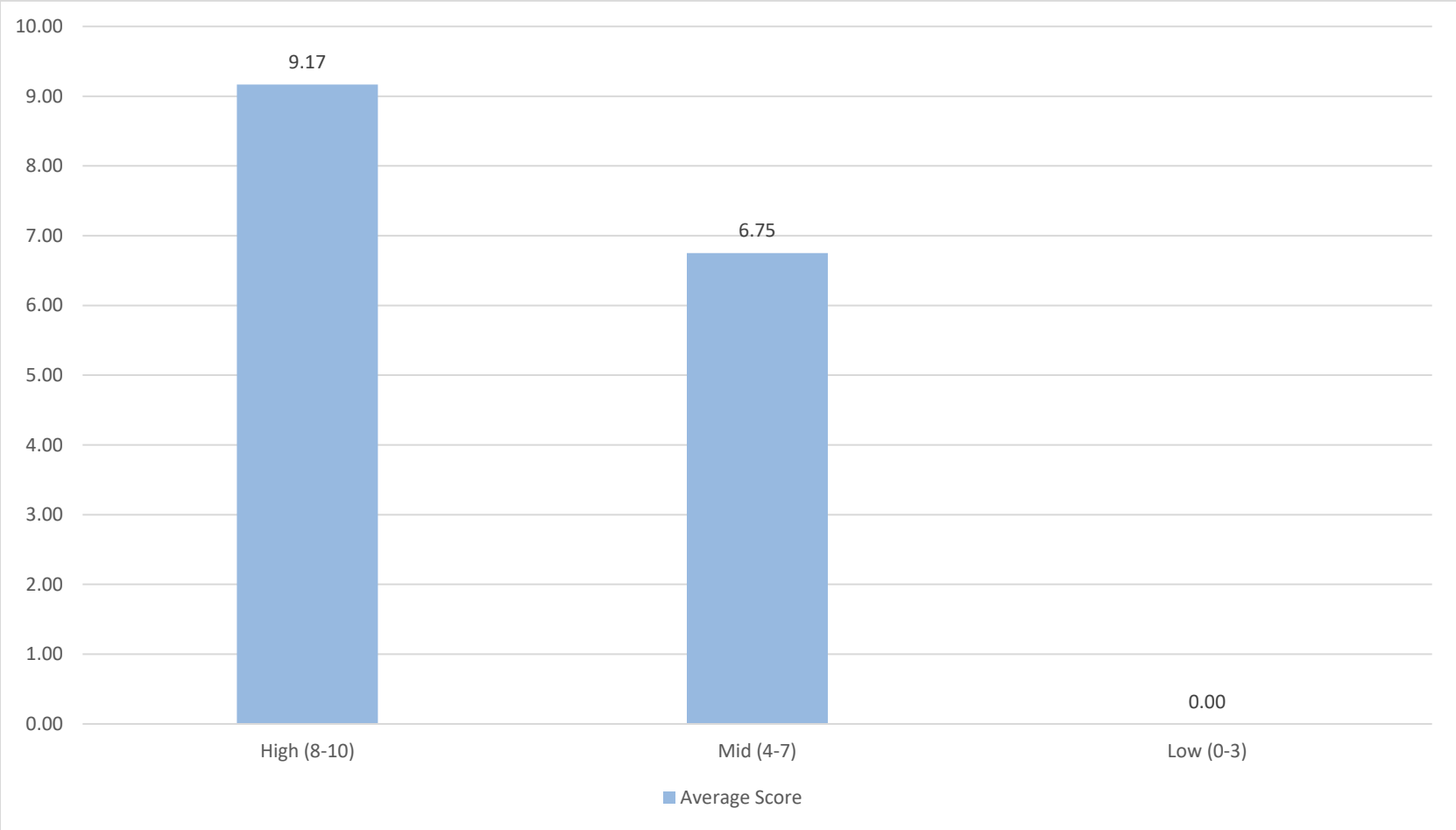

Table 4.3.2-12 Average Scores for Responses to 'I would recommend that my organization use VR experiences to help with stress (anxiety)'.

Average	8.56

	n	Average Score
High (8-10)	12	9.17
Mid (4-7)	4	6.75
Low (0-3)	0	0.00

A highly significant average score of 8.56 (out of 10) is reported when asked if participants would recommend virtual reality experiences for adoption to their organization. Looking at score ranges from high, mid to low, no participant reported a low recommendation score, with most report an average score of 9.17 (out of 10) in the high range. This is indicative of the benefit, and, perceived value of the technology, independent of how the participant reported on other variables. Participants who reported lower levels of stress reduction, also see value, and, understand that the limitation of exposure in the context of this study does not mean that the technology is not of value. Participants most likely see broader benefits when organization elaborate on the delivery, and, quality of the experiences within a more formal, and, familiar environment.

Figure 4.3.2-13 Average Score for Responses to ‘My Organizations Takes Workplace Stress Seriously and, Has Programs in Place to Help Me’.

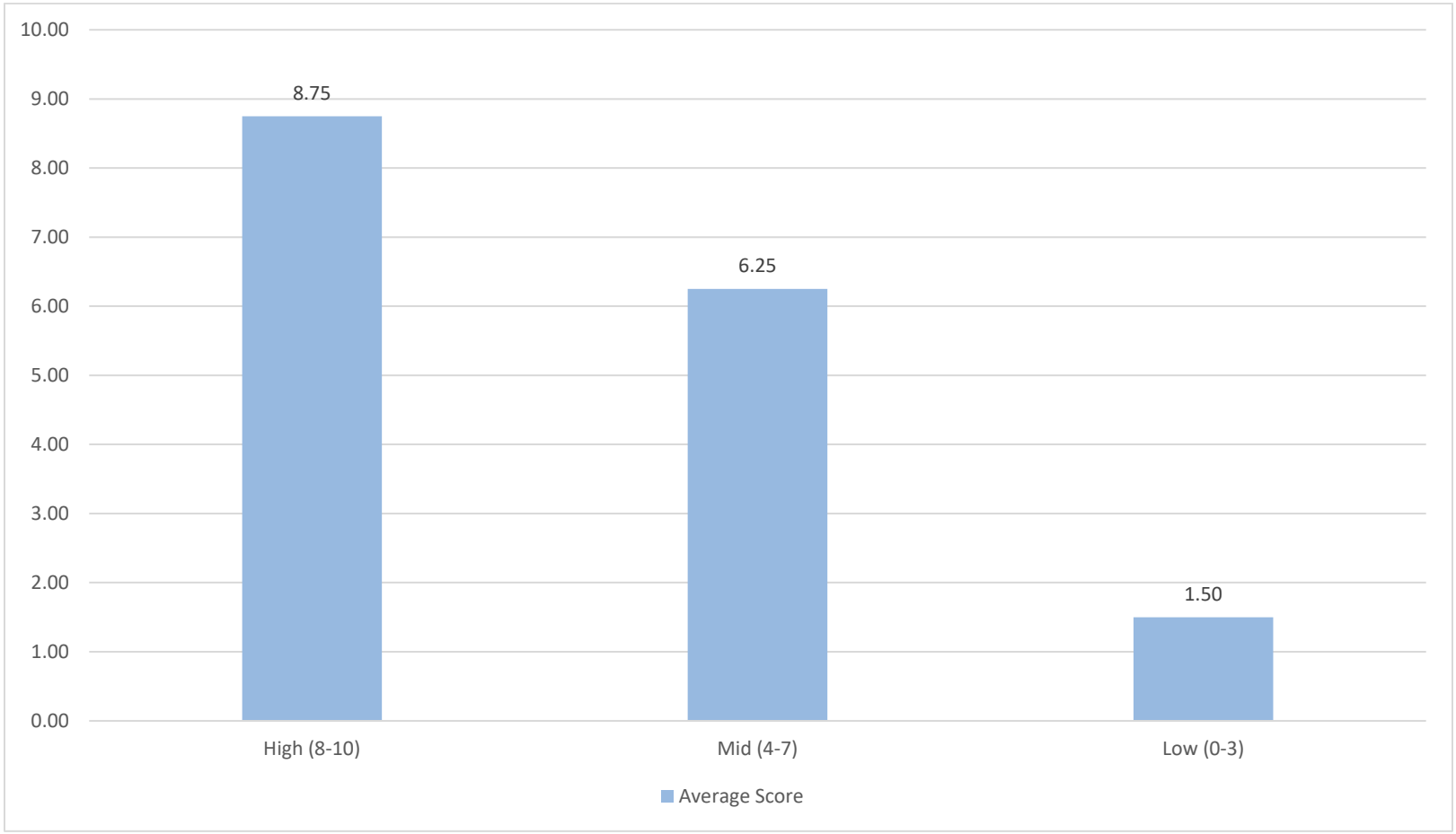

Table 4.3.2-13 Average Score of Responses to ‘My Organizations Takes Workplace Stress Seriously and, Has Programs in Place to Help Me’.

Average	5.69

	n	Average Score
High (8-10)	4	8.75
Mid (4-7)	8	6.25
Low (0-3)	4	1.50

This chart and, table show data to support findings from previous sections, and, to add additional perspective about the participant population as being a representative sample that is valid for the purposes of this research study.

Figure 4.3.2-14 Average Score of Responses to ‘Workplace stress influences my at-home life (including relationships)’.

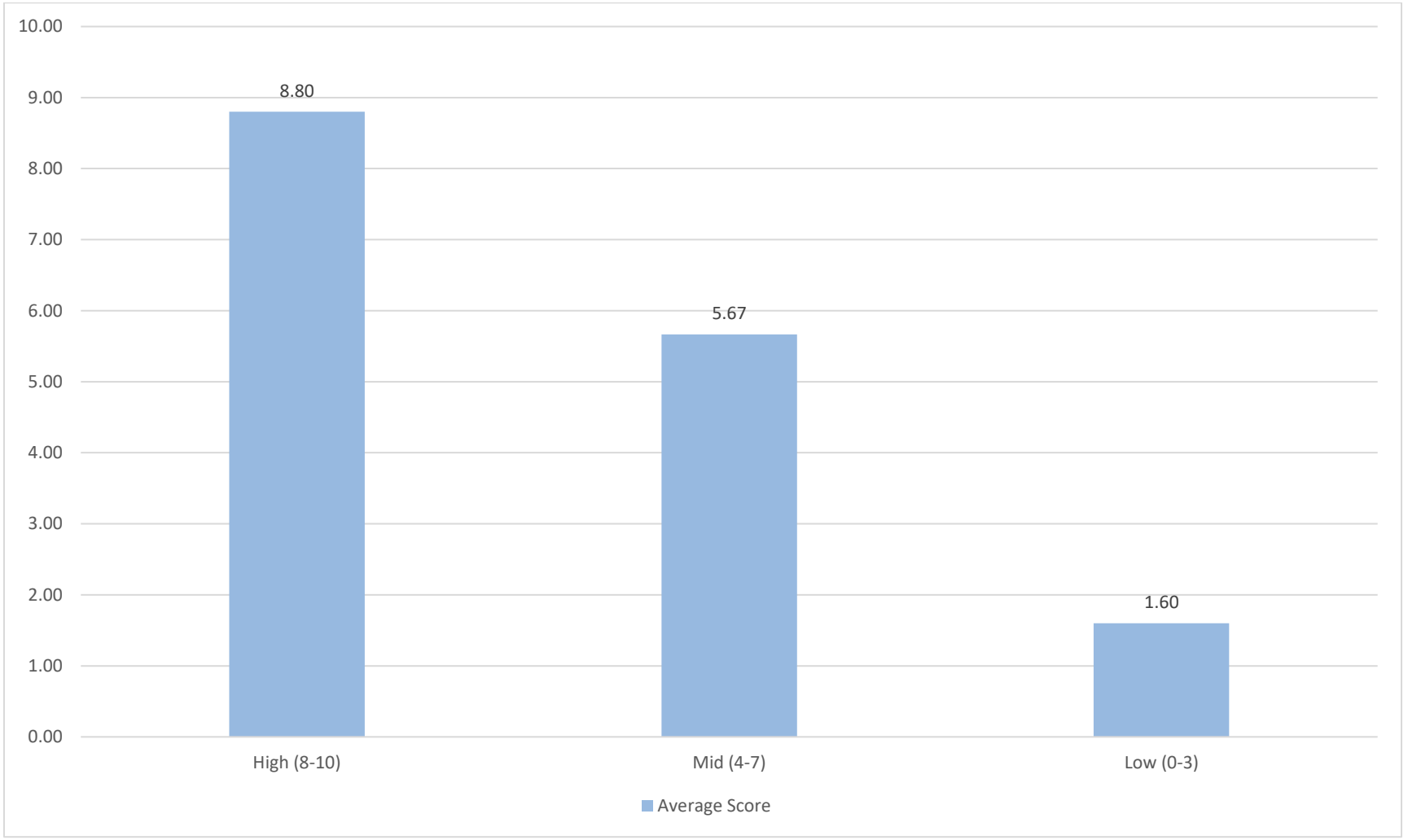

Table 4.3.2-14 Responses to 'Workplace stress influences my at-home life (including relationships)'.

Average	5.38

	n	Average Score
High (8-10)	5	8.80
Mid (4-7)	6	5.67
Low (0-3)	5	1.60

This chart and, table show data to support findings from previous sections, and, to add additional perspective about the participant population as being a representative sample that is valid for the purposes of this research study.

The data indicates that a significant number of participants provided an average score in the mid to high range, with an average of 5.38. This data adds value to the idea that workplace stress has consequential effect to individual lives outside of work. Although this study did not define influences, it is assumed that this idea would be understood as negative effects. It is also important to note that influences of workplace stress on at-home life can have multiplier results that can be highly detrimental to the organization. Detriments in this context may include increased turnover, low quality of work or performance, individual conflict, and, other consequences.

After exposure to the virtual reality experiences, participants were asked what changes they would suggest. This section provides insights, in summary, about what participants have reported. Verbatim commentary is presented in an Appendix J.

Table 4.3.2-15 Participants Submitting Free Form Comments

	n	%
Number of participants who provided free form comments.	13	81.25%
Number of participants who did not answer this question.	3	18.75%

Comments represent net promoters and, no negative suggestions were made. It should be noted that the 3 participants who did not provide commentary submitted the lowest score when asked if they would recommend such technology to their employer. 2 of these participants reported that their stress levels did not improve at all.

Participants who provided comments suggest;

- Subtitles and, Visuals: Consider incorporating subtitles and, more visuals to enhance the experience.
- Interactivity: Introduce interactive components such as movement, or ways to encourage more active participation from the audience.
- Audio Enhancements: Use a surround sound headset to create an immersive audio environment.
- Guided Practice: Include guided meditation, breathing exercises, and, more relaxing music. Allow time for participants to practice and, repeat instructions, enhancing engagement and, ensuring they actually apply what is being taught.

- Encouraging Practice: Implement elements that encourage the audience to interact and, practice the techniques being presented.

Figure 4.3.2-15 Participation by Gender

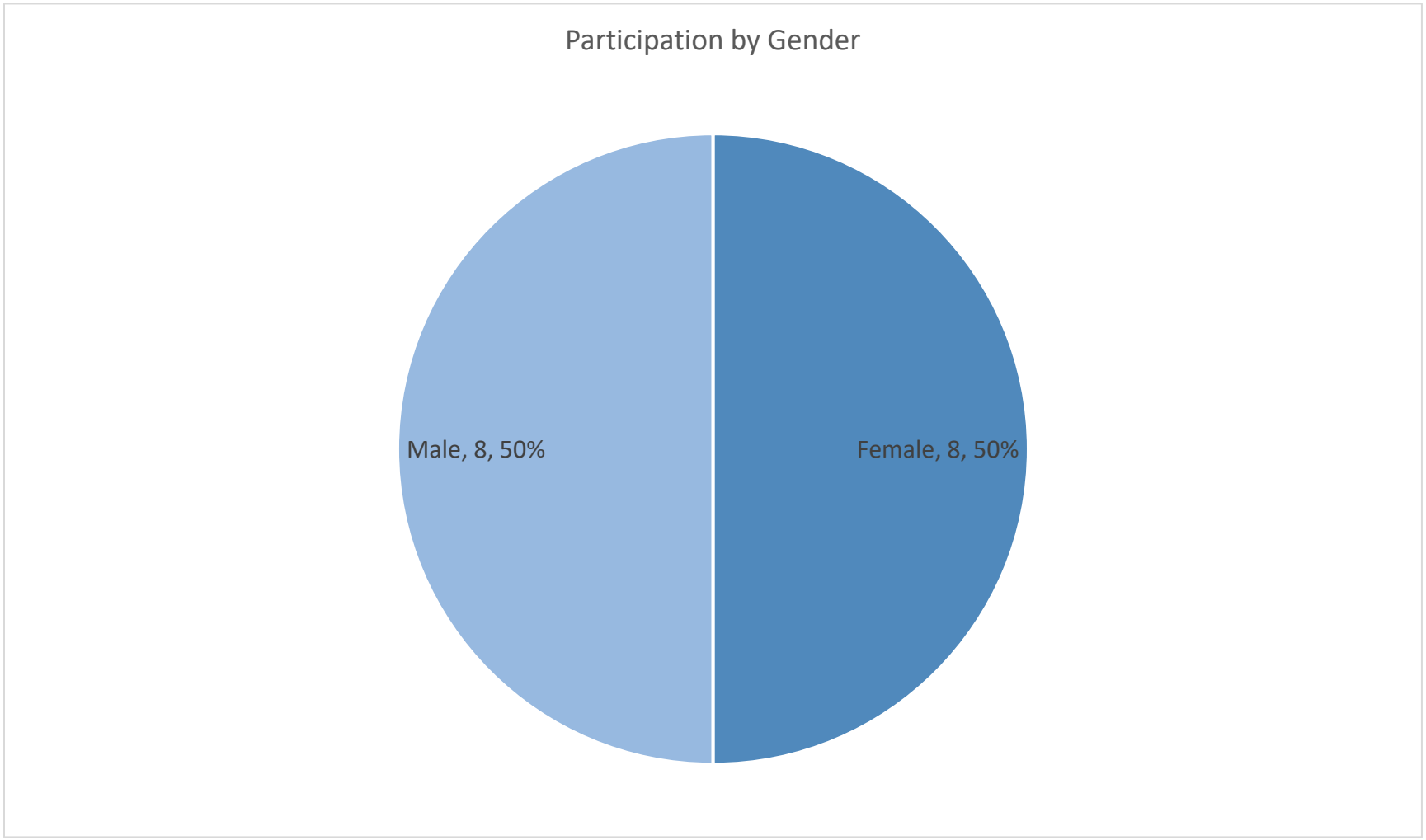

Table 4.3.2-16 Participation by Gender

Gender	*n*	%
Female	8	50.00%
Male	8	50.00%
Total	**16**	**100.00%**

This chart and, table show data to support findings from previous sections, and, to add additional perspective about the participant population as being a representative sample that is valid for the purposes of this research study.

Figure 4.3.2-16 Participation by Highest Education Level

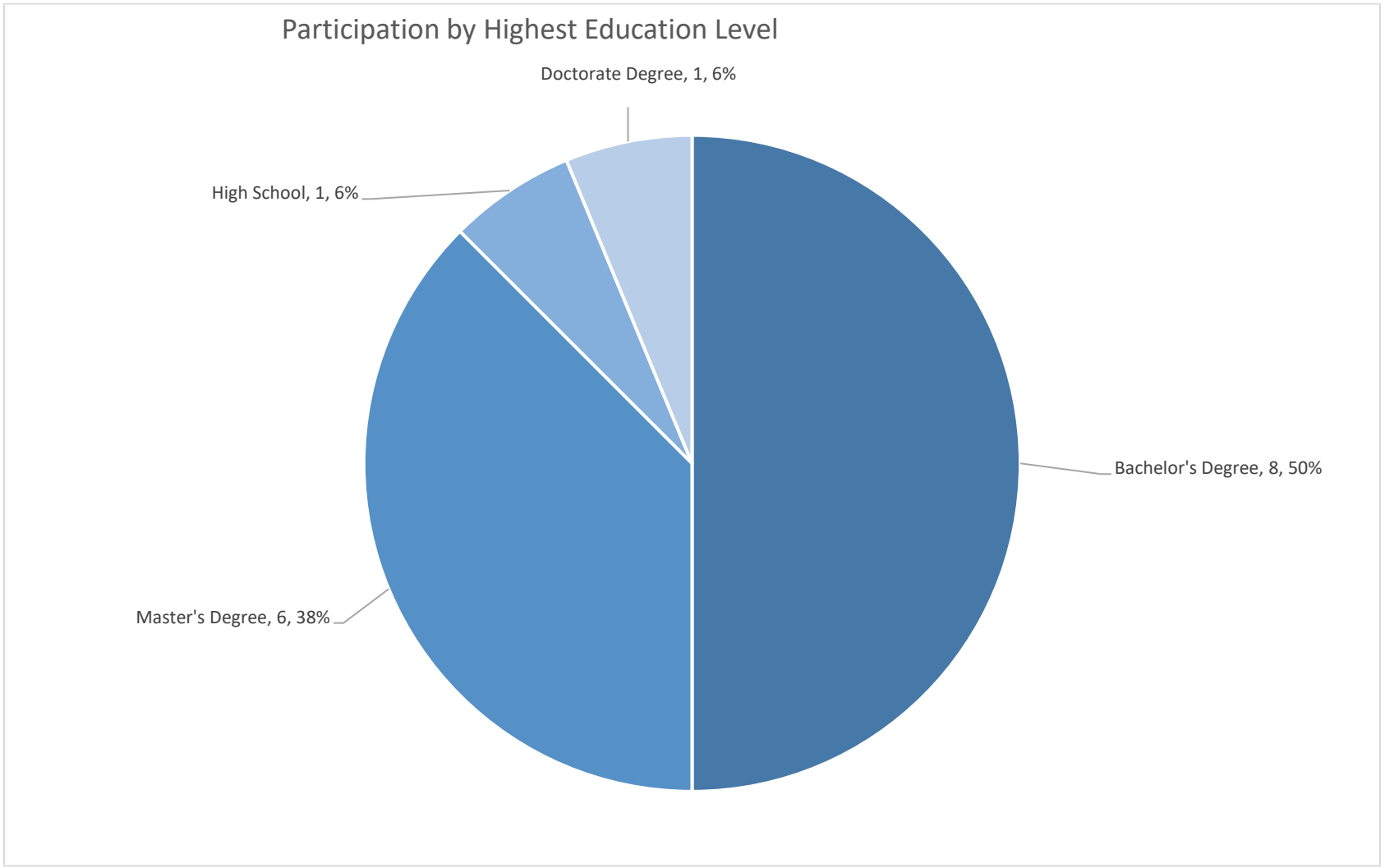

Table 4.3.2-17 Participation by Highest Education Level

Highest Education Level	*n*	%
Bachelor's Degree	8	50.00%
Master's Degree	6	37.50%
High School	1	6.25%
Doctorate Degree	1	6.25%
Total	**16**	**100.00%**

This chart and, table show data to support findings from previous sections, and, to add additional perspective about the participant population as being a representative sample that is valid for the purposes of this research study.

Figure 4.3.2-17 Participation by Job Type

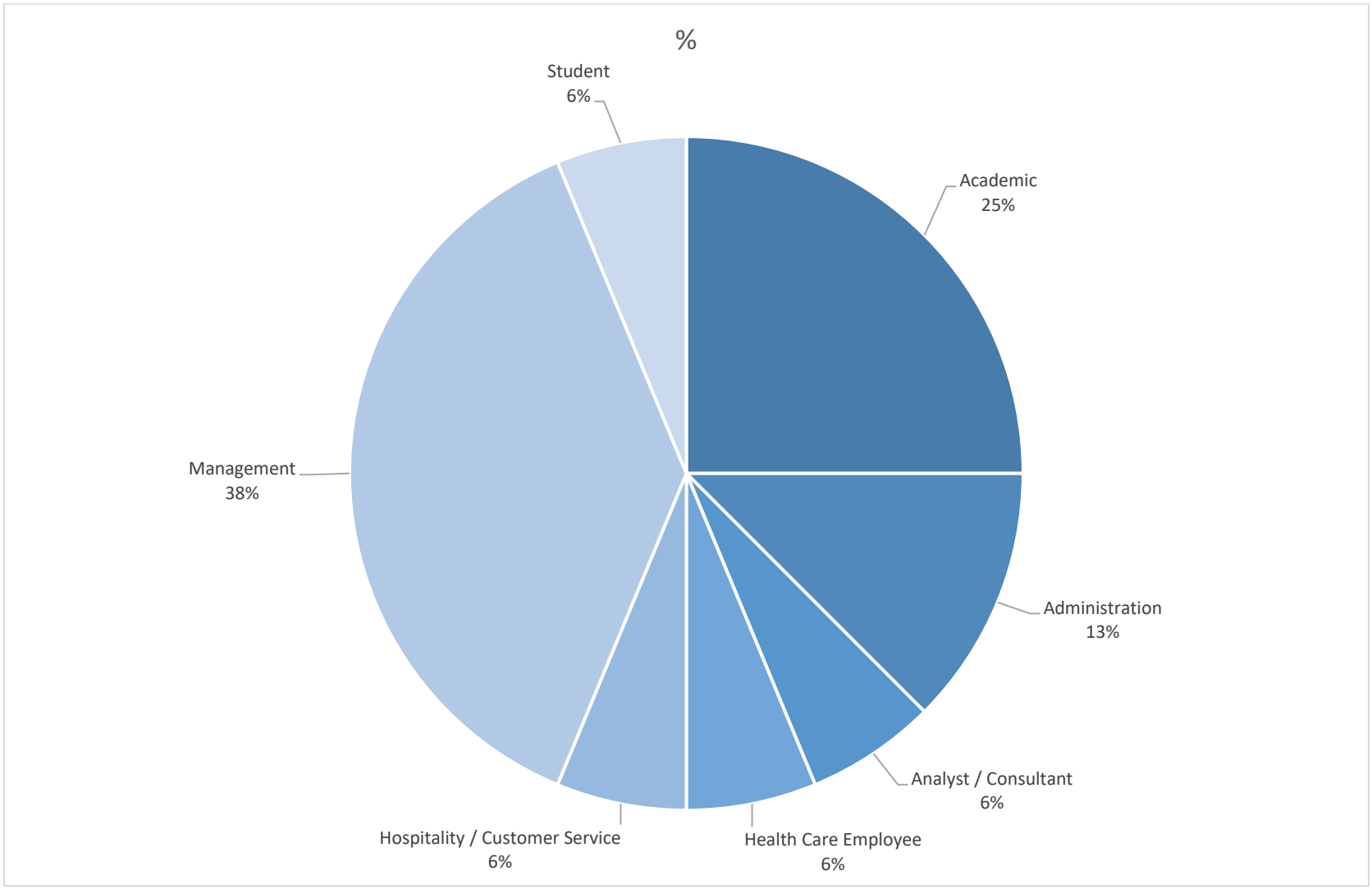

Table 4.3.2-18 Participation by Job Type

Job Type	*n*	%
Academic	4	25.00%
Administration	2	12.50%
Analyst / Consultant	1	6.25%
Health Care Employee	1	6.25%
Hospitality / Customer Service	1	6.25%
Management	6	37.50%
Student	1	6.25%
Total	16	100.00%

This chart and, table show data to support findings from previous sections, and, to add additional perspective about the participant population as being a representative sample that is valid for the purposes of this research study.

Figure 4.3.2-18 Participation by Industry

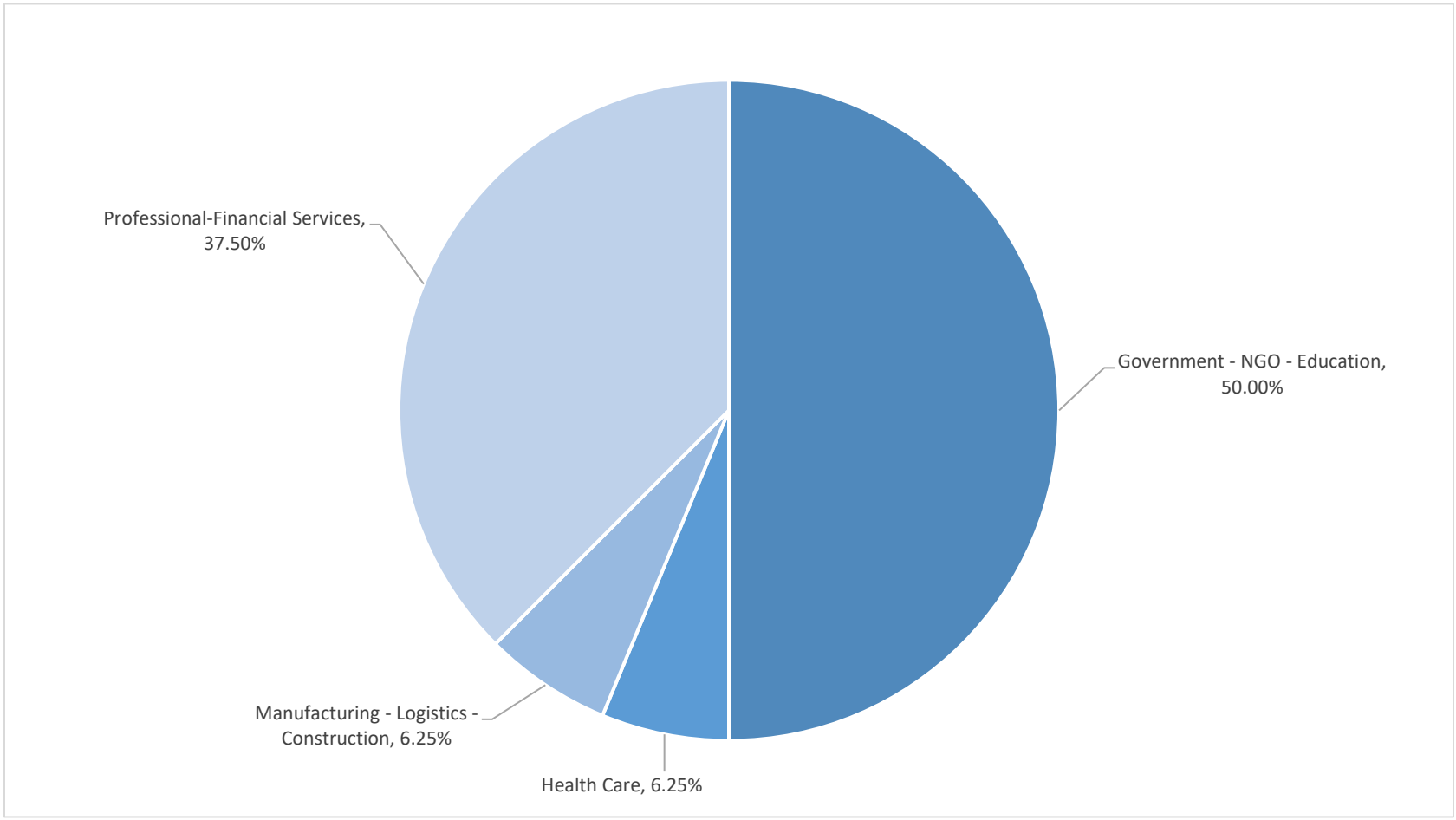

Table 4.3.2-19 Participation by Industry

Industry	*n*	%
Government - NGO - Education	8	50.00%
Health Care	1	6.25%
Manufacturing - Logistics - Construction	1	6.25%
Professional-Financial Services	6	37.50%
Total		100.00%

This chart and, table show data to support findings from previous sections, and, to add additional perspective about the participant population as being a representative sample that is valid for the purposes of this research study.

Figure 4.3.2-19 Participation by Years in Profession

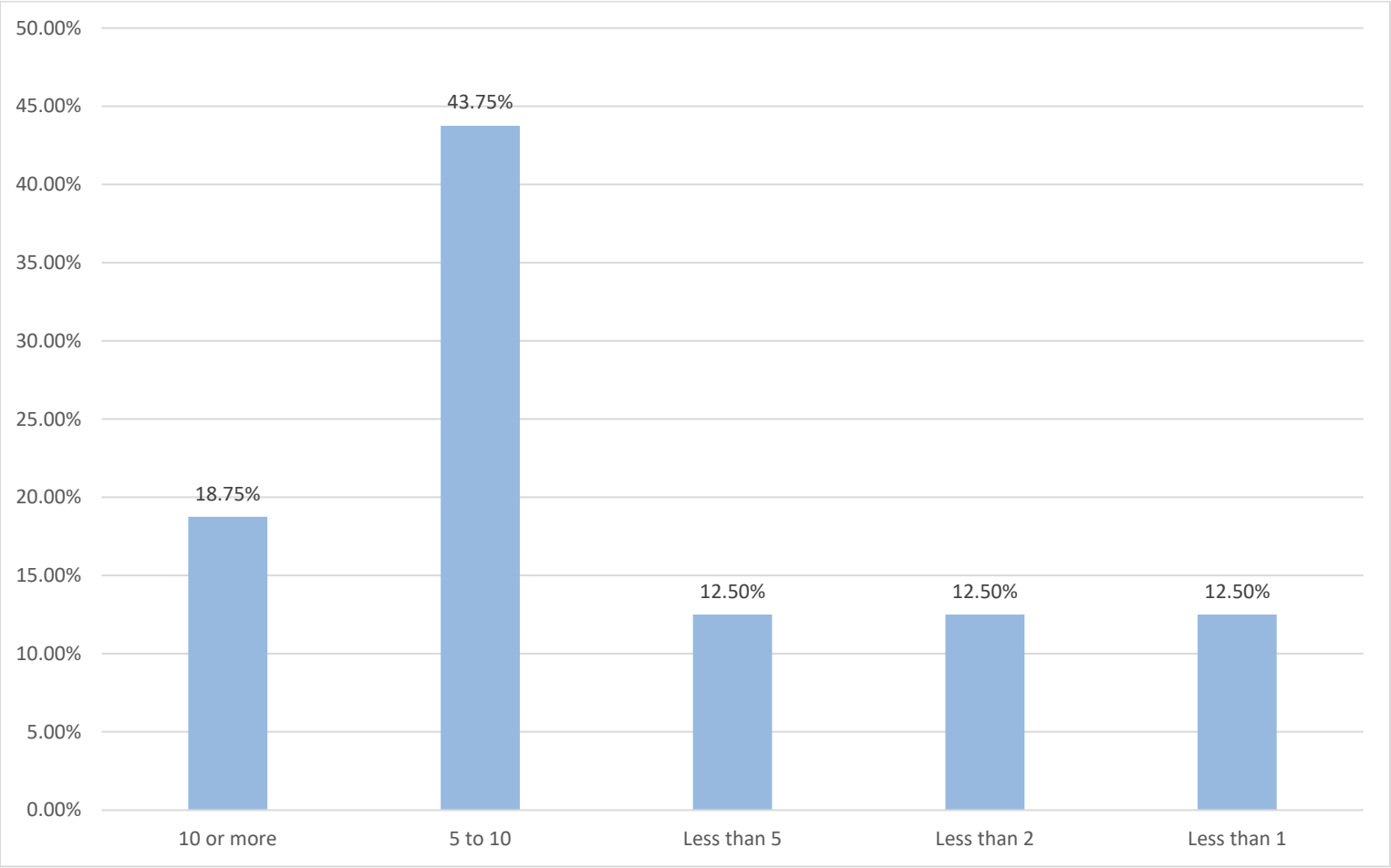

Table 4.3.2-20 Participation by Years in Profession

Years	n	%
10 or more	3	18.75%
5 to 10	7	43.75%
Less than 5	2	12.50%
Less than 2	2	12.50%
Less than 1	2	12.50%
Total	16	100.00%

This chart and, table show data to support findings from previous sections, and, to add additional perspective about the participant population as being a representative sample that is valid for the purposes of this research study.

Figure 4.3.2-20 Participation by Size of Organization

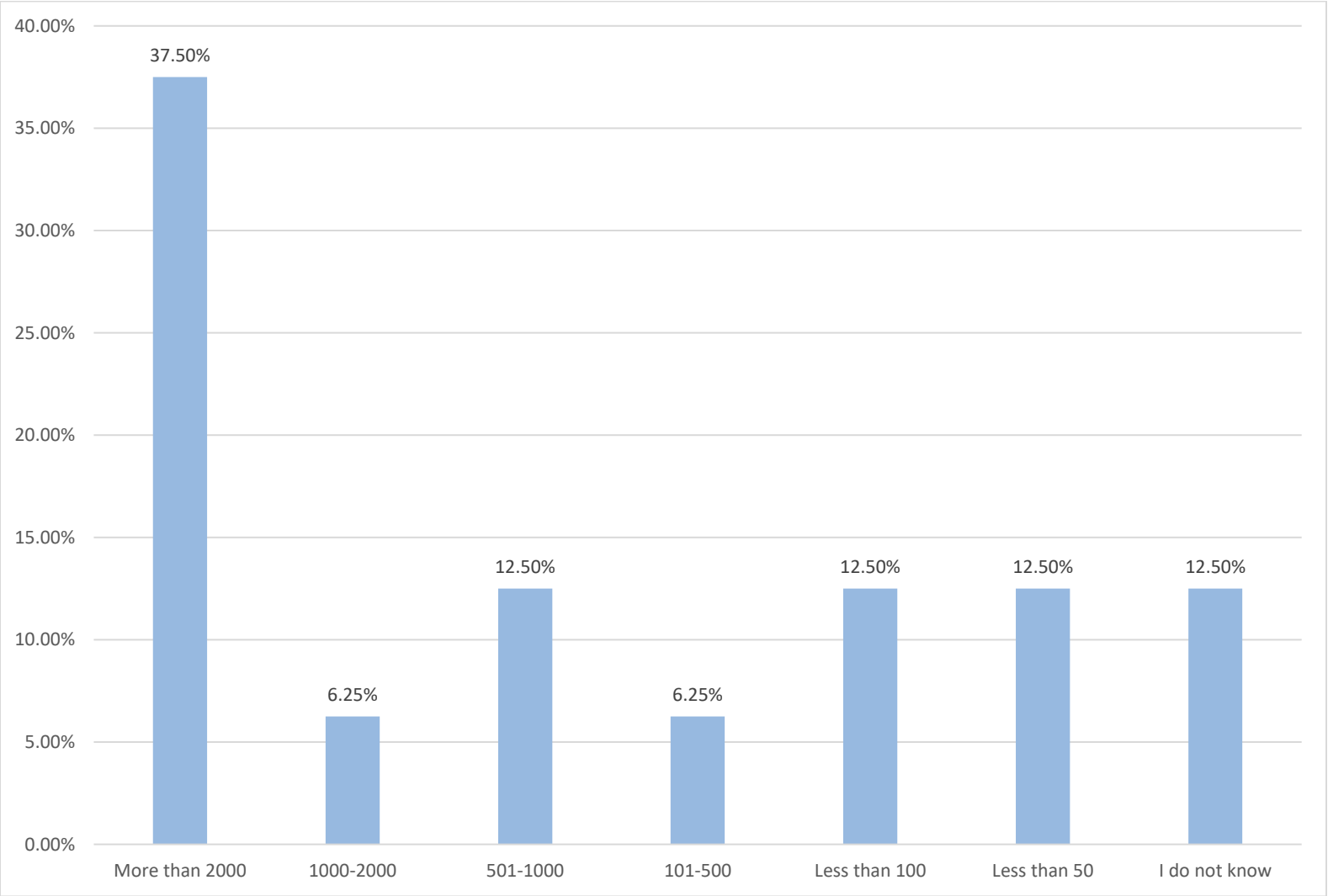

Table 4.3.2-21 Participation by Size of Organization

Years	*n*	%
More than 2000	6	37.50%
1000-2000	1	6.25%
501-1000	2	12.50%
101-500	1	6.25%
Less than 100	2	12.50%
Less than 50	2	12.50%
I do not know	2	12.50%
Total	16	100.00%

This chart and, table show data to support findings from previous sections, and, to add additional perspective about the participant population as being a representative sample that is valid for the purposes of this research study.

4.3.3 Findings – Section 2 - General Workplace Stress Pulse Survey

This second part of the findings section outlines the results of the general population survey that provides insights into;

- The types of organizations participants work for,
- The nature of their occupation,
- Perceived causes of workplace stress,
- Mechanisms and, programs available to cope with such stress (institutional level),
- Specific effects of such stress.

Data is presented in graphical format, followed by a data table representation and, analysis narrative.

Where a score is represented, a Likert (Graphical Rating Scale) has been used. Scores are rates as follows;

- Zero (0) is the lowest score associating with a sentiment of Strongly Disagree,
- Ten (10) is the highest score associating with a sentiment of Strongly Agree.

In some representations, an aggregate of scores is scaled as follows;

Score Range	Aggregate Rating Label	
0-3	Low	
4-7	Mid	
8-10	High	

Figure 4.3.3-1 Responses to “My organization takes workplace stress seriously & has programs in place to help me.” by Job Type

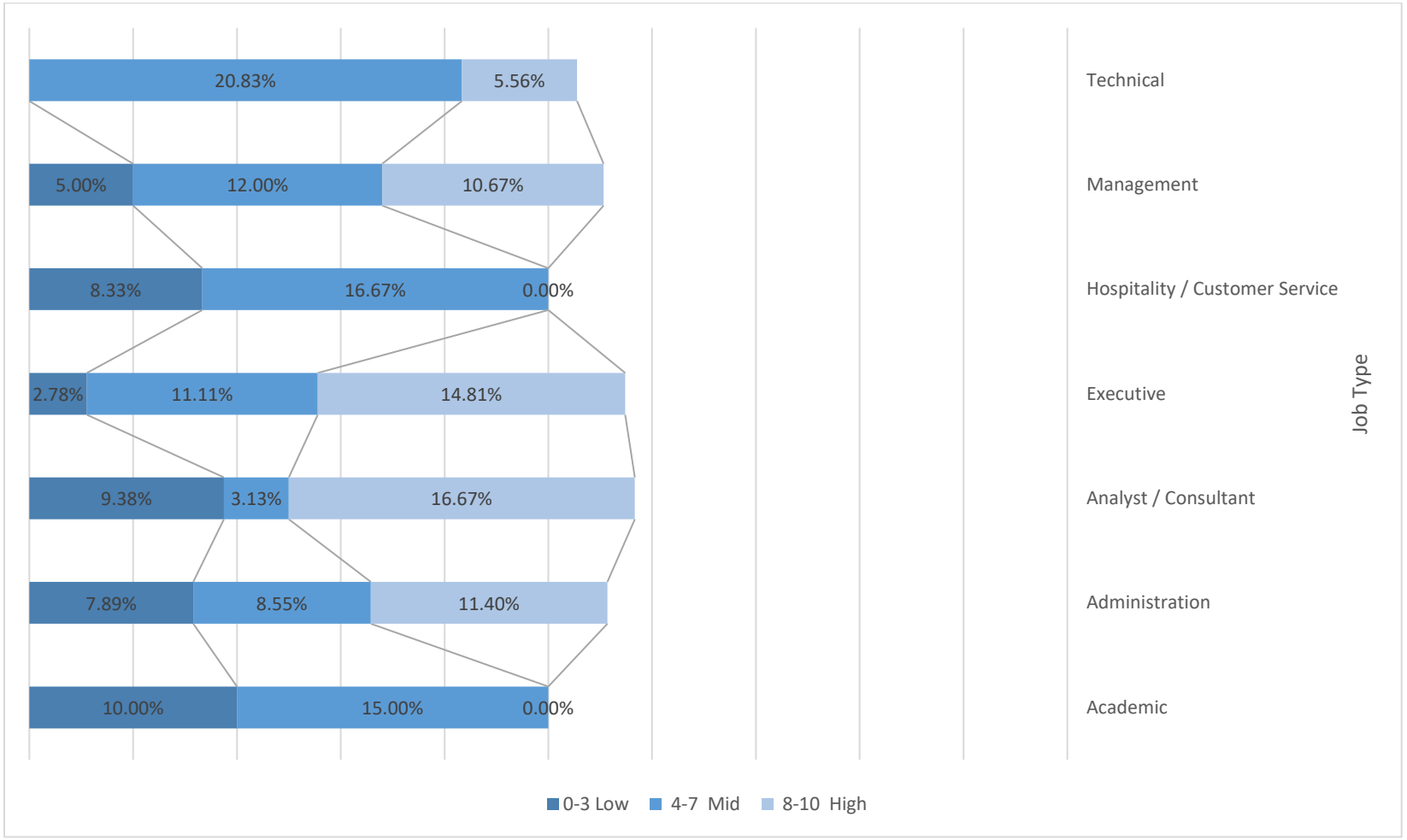

Table 4.3.3-1 Responses to “My organization takes workplace stress seriously & has programs in place to help me.” by Job Type

Job Type	0-3 Low	4-7 Mid	8-10 High
Academic	10.00%	15.00%	0.00%
Administration	7.89%	8.55%	11.40%
Analyst / Consultant	9.38%	3.13%	16.67%
Executive	2.78%	11.11%	14.81%
Hospitality / Customer Service	8.33%	16.67%	0.00%
Management	5.00%	12.00%	10.67%
Technical	0.00%	20.83%	5.56%
Total	6.50%	11.00%	10.00%

Overall, all job types report that their organizations have programs to help with workplace stress. Job types providing the most promoting scores (high) are represented by management, or administration. The lowest detracting scores are represented by participants working in the academic, hospitality and, technology jobs.

It is suggested that the relatively high scores given by management level participants may be due to their role of being he designers and, providers of programs associated with helping employees with workplace stress. This may be a result of optimism bias. (Flyvbjerg, 2021).

Lower detracting scores given by those working in academic and, hospitality settings may have resulted from the nature of their occupation. These occupations often involve fast-paced environments and, might not be highly paid and, are very much public facing, with the challenges associated with varied exposure to negative behaviours. (Yusriani, 2023). Although their employers might be providing standard programs to

help with stress, the elevated levels of workplace anxiety may be associated with a perception of having access to less help from their employers.

Figure 4.3.3-2 Responses to “Workplace stress influences my at-home life (including relationships).” by Job Type

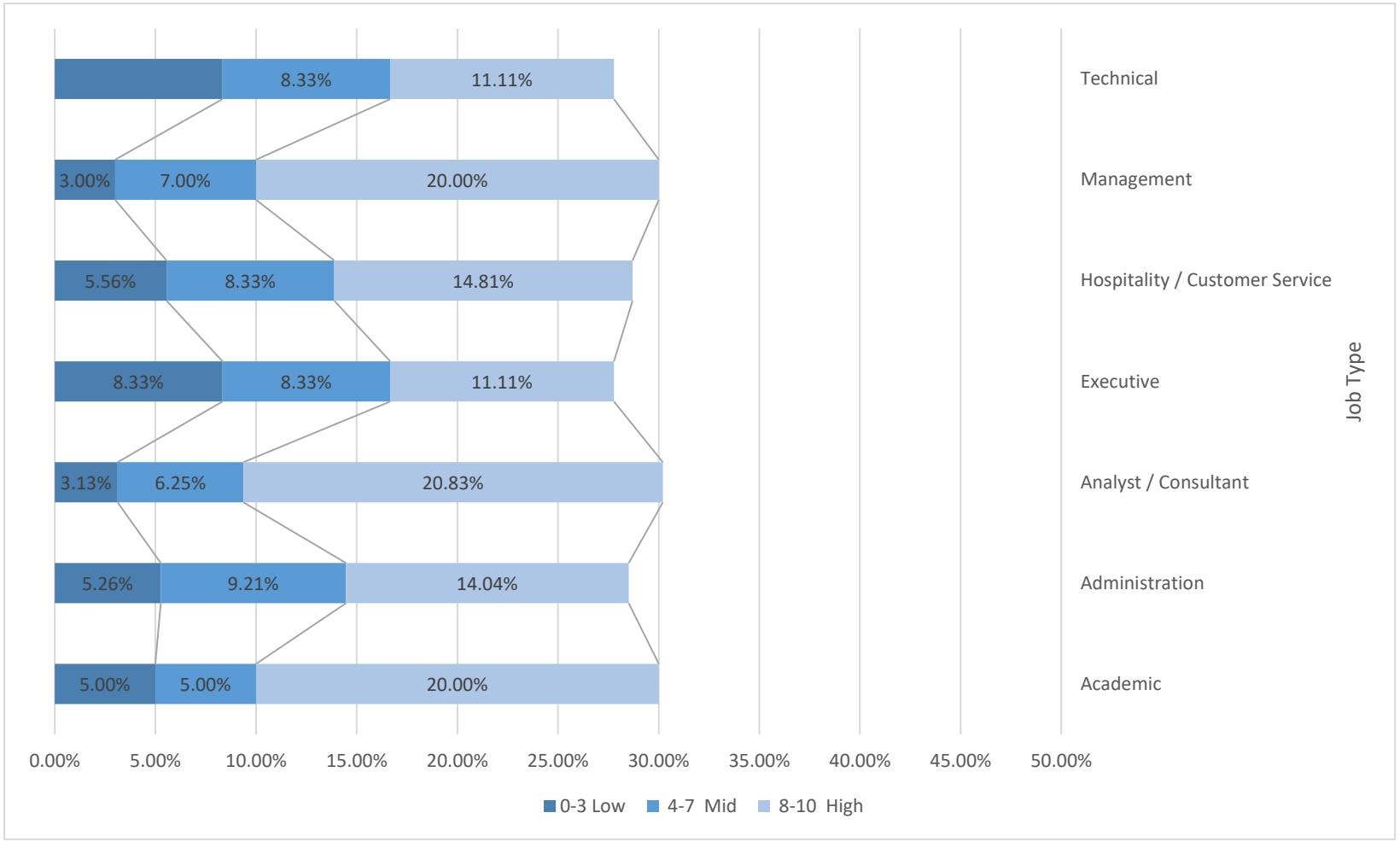

Table 4.3.3-2 Responses to "Workplace stress influences my at-home life (including relationships)." by Job Type

Job Type	0-3 Low	4-7 Mid	8-10 High
Academic	5.00%	5.00%	20.00%
Administration	5.26%	9.21%	14.04%
Analyst / Consultant	3.13%	6.25%	20.83%
Executive	8.33%	8.33%	11.11%
Hospitality / Customer Service	5.56%	8.33%	14.81%
Management	3.00%	7.00%	20.00%
Technical	8.33%	8.33%	11.11%
Total	5.00%	8.00%	16.00%

When asked if workplace stress affects their life outside of work, participants have indicated predominantly scores in the high rating category. This result is evidenced across job types and, is not exclusive to any particular one, however the highest percentage of responses are represented by those who may have jobs that are inherently stressful, therefore taking the stresses to their domestic environments. Coleman, in an article about work-stress, suggests 'work-life interference are higher among those who "hold professional jobs with more authority, decision-making latitude, pressure, and, longer hours.'. (Coleman, 2016). This is indicative of the jobs that provided the highest scored related to this question, jobs that most likely require work to be taken home and, continual thinking about work.

Figure 4.3.3-3 Responses to “My organization takes workplace stress seriously & has programs in place to help me.” by Industry

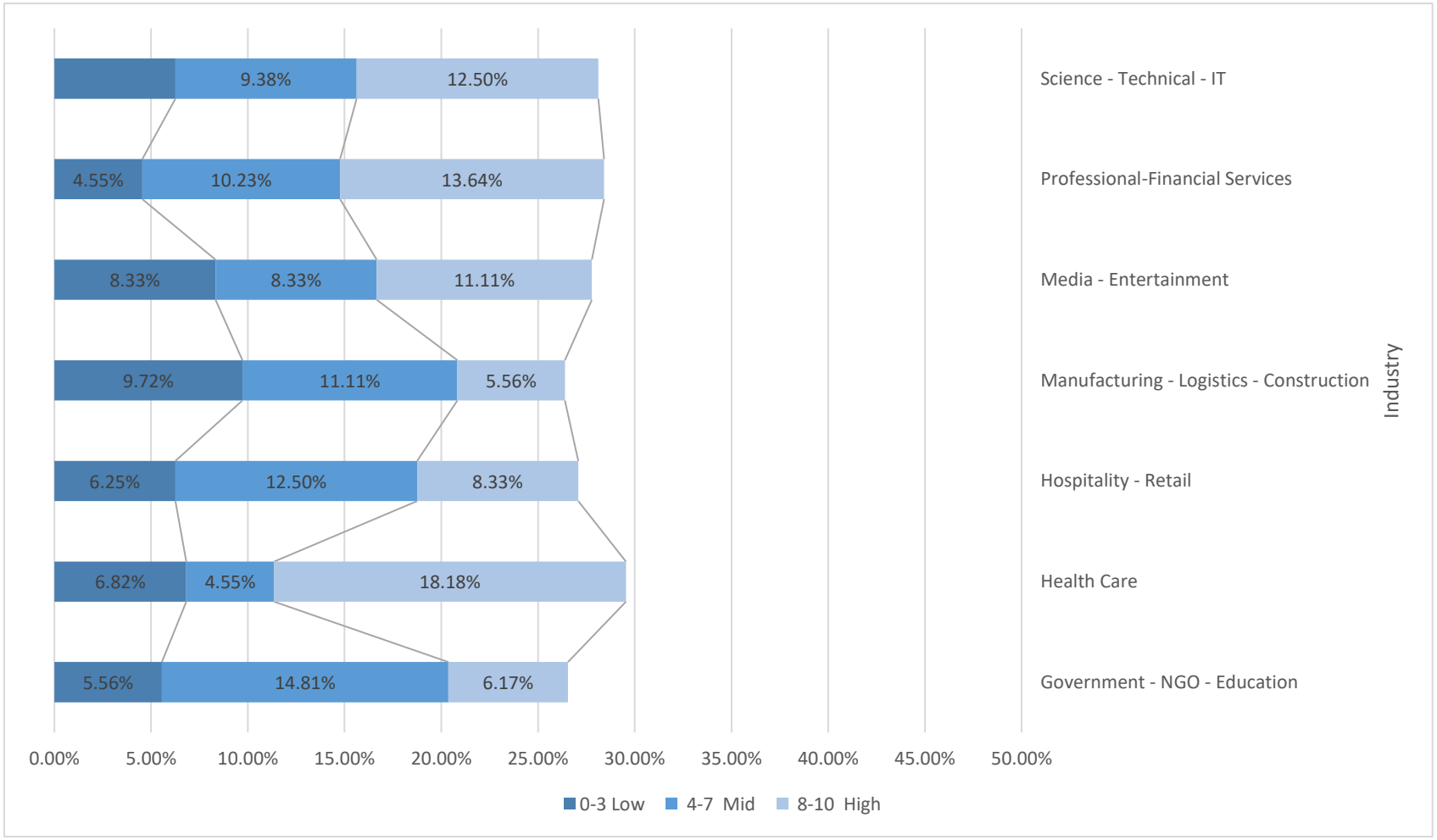

Table 4.3.3-3 Responses to "My organization takes workplace stress seriously & has programs in place to help me." by Industry

Industry	0-3 Low	4-7 Mid	8-10 High
Government - NGO - Education	5.56%	14.81%	6.17%
Health Care	6.82%	4.55%	18.18%
Hospitality - Retail	6.25%	12.50%	8.33%
Manufacturing - Logistics - Construction	9.72%	11.11%	5.56%
Media - Entertainment	8.33%	8.33%	11.11%
Professional-Financial Services	4.55%	10.23%	13.64%
Science - Technical - IT	6.25%	9.38%	12.50%
Total	6.50%	11.00%	10.00%

Participants associated with the health care industry strongly indicate that their organization takes workplace stress seriously and, has programs to help them. This study is conducted with participants in the Canadian context. Canadian health care systems are mostly government funded, with strong requirements for extended benefits for employees and, programs to help with work-life balance, which includes stress related benefits. Canada, in 2013, introduced a national voluntary standard on psychological safety in the workplace, with the health care sector being beneficiary of this standard. "…a fundamental way to better healthcare is through healthier healthcare workplaces; and, it is unacceptable to work in, receive care in, govern, manage and, fund unhealthy healthcare workplaces." (HealthcareCAN, 2015).

It should be noted that the manufacturing industry type has participants that reported a low rating range the most. It is possible that this industry includes the lowest paying jobs, with ease of entry into the job, with fewer educational requirements. This

may lead employers in this industry type to not offer supports to help with workplace stress, as do those with jobs that are more skilled, involved, creative and, difficult to recruit for. Employees in the manufacturing, logistics and, construction organizations report noticing that there are fewer support to help with workplace stress for them, then their corporate counterparts. (ISHN, 2022).

Figure 4.3.3-4 Responses to “Workplace stress influences my at-home life (including relationships).” by Industry

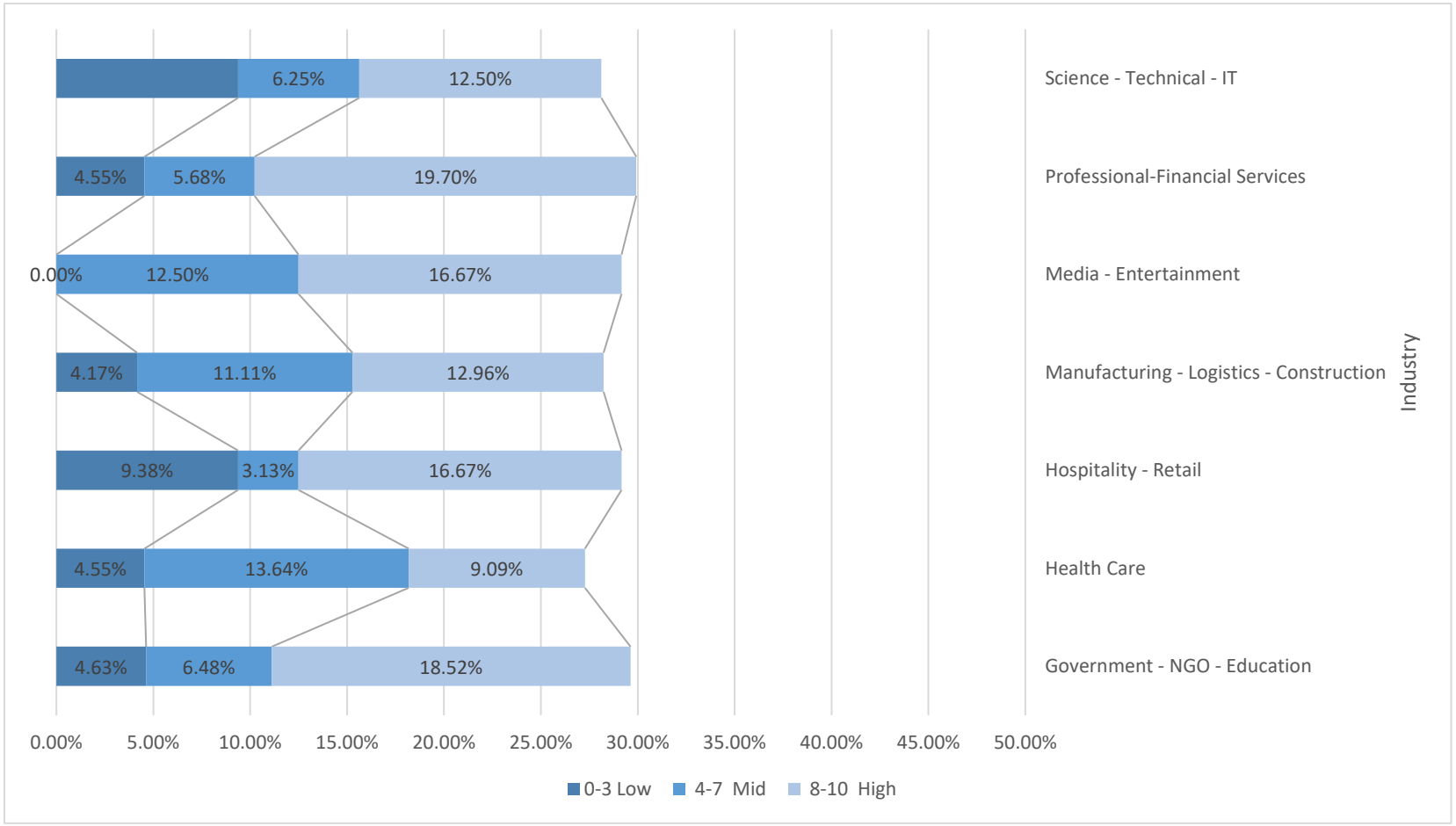

Table 4.3.3-4 Responses to “Workplace stress influences my at-home life (including relationships).” by Industry

Industry	0-3 Low	4-7 Mid	8-10 High
Government - NGO - Education	4.63%	6.48%	18.52%
Health Care	4.55%	13.64%	9.09%
Hospitality - Retail	9.38%	3.13%	16.67%
Manufacturing - Logistics - Construction	4.17%	11.11%	12.96%
Media - Entertainment	0.00%	12.50%	16.67%
Professional-Financial Services	4.55%	5.68%	19.70%
Science - Technical - IT	9.38%	6.25%	12.50%
Total	5.00%	8.00%	16.00%

Participants report that the workplace stress affects their home life in a consistent manner across industries. This is no significant pattern in industries that report low or high scores related to this question. The only exception is a lower aggregate rating percentage from those associated with the hospitality and, science industries.

Figure 4.3.3-5 Responses to “My organization takes workplace stress seriously & has programs in place to help me.” by Organization Size

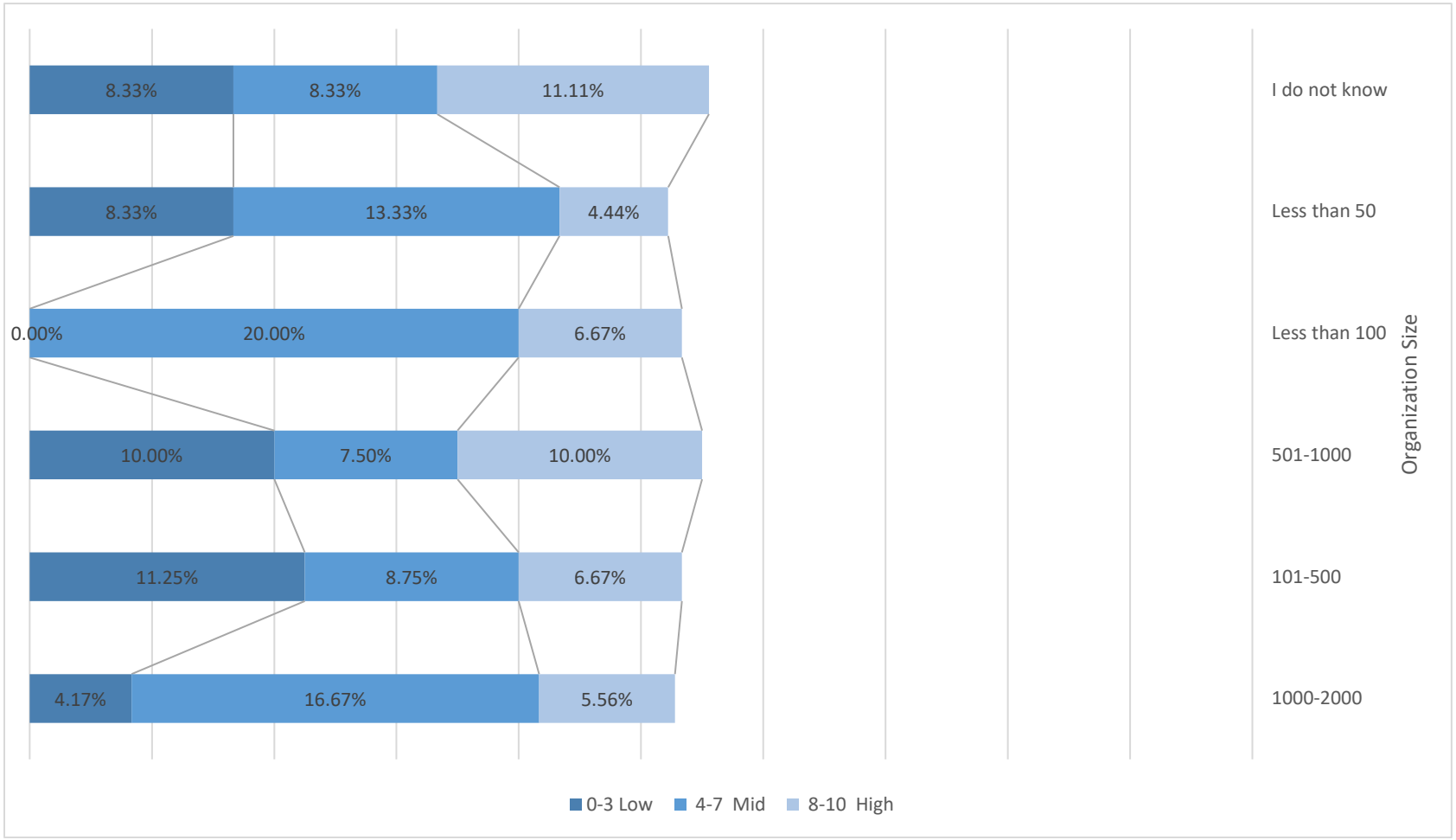

Table 4.3.3-5 Responses to "My organization takes workplace stress seriously & has programs in place to help me." by Organization Size

Organization Size	0-3 Low	4-7 Mid	8-10 High
More than 2000	3.66%	10.37%	14.63%
1000-2000	4.17%	16.67%	5.56%
101-500	11.25%	8.75%	6.67%
501-1000	10.00%	7.50%	10.00%
Less than 100	0.00%	20.00%	6.67%
Less than 50	8.33%	13.33%	4.44%
I do not know	8.33%	8.33%	11.11%
Total	6.50%	11.00%	10.00%

The data indicate that larger organizations, with more than 2000 employees have participant membership that reported a high aggregate score when asked if workplace stress is being taken seriously and, that programs are provided by the employer. It is interesting to note that a large number of participants reported not knowing how large the organization is in terms of staff. This may be an indication of the large size, as it would be more difficult to organically determine size, as opposed to smaller organizations where staff number are more quantifiable.

The fact that participants from larger organizations perceive that their employer takes workplace stress seriously and, has programs to help with it, might be a result of available of resources. It may be that larger organizations have more formal administrative processes in place to recognize, formalize and, create program related to workplace stress. Smaller organizations, perhaps in growth mode, might not have the framework in place for such recognition or program development. Howatt suggests that

large employers are more likely to have mental health supports in place than smaller ones. (Howatt, 2022).

Figure 4.3.3-6 Responses to “Workplace stress influences my at-home life (including relationships).” by Organization Size

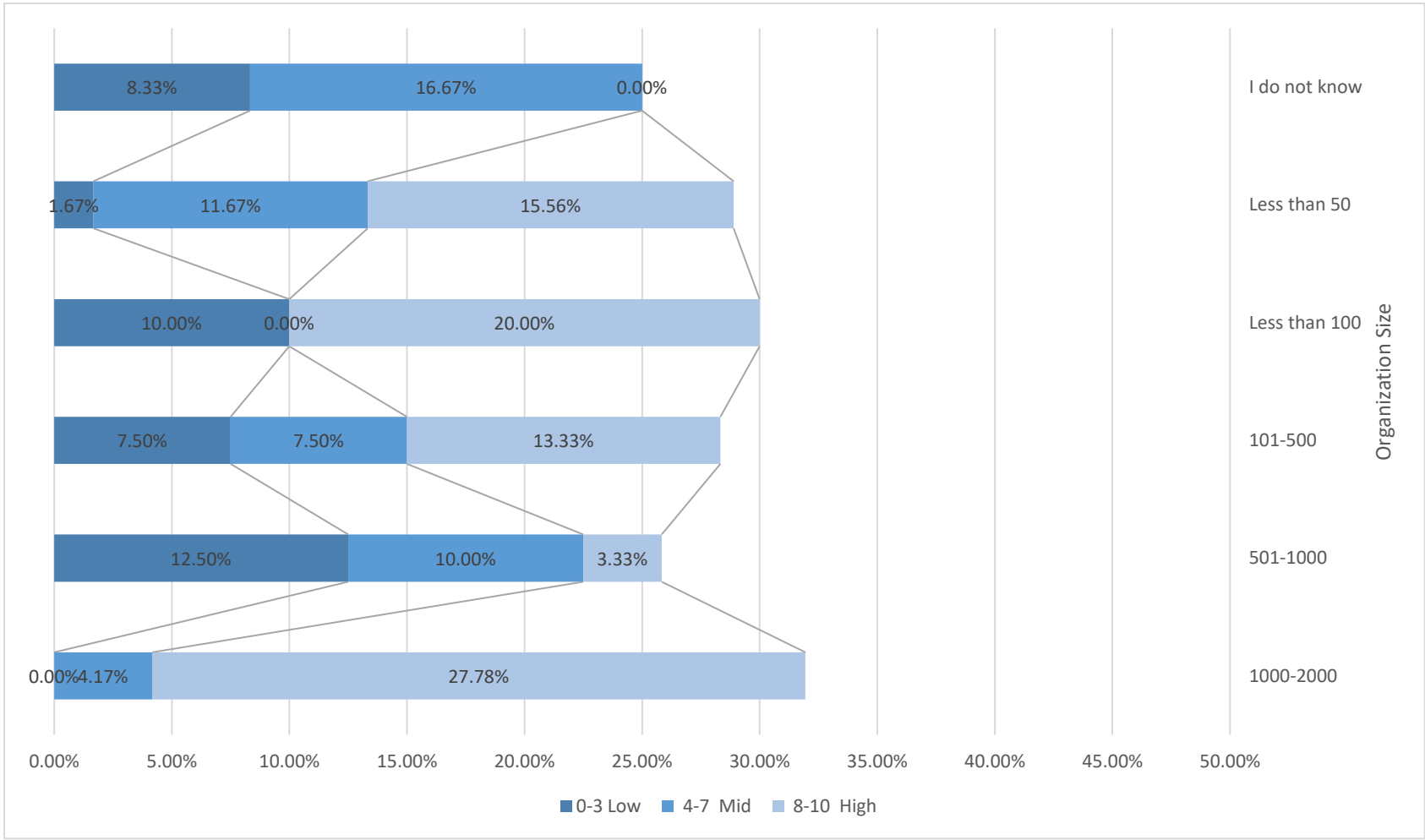

Table 4.3.3-6 Responses to “Workplace stress influences my at-home life (including relationships).” by Organization Size

Organization Size	0-3 Low	4-7 Mid	8-10 High
More than 2000	3.05%	7.32%	19.51%
1000-2000	0.00%	4.17%	27.78%
501-1000	12.50%	10.00%	3.33%
101-500	7.50%	7.50%	13.33%
Less than 100	10.00%	0.00%	20.00%
Less than 50	1.67%	11.67%	15.56%
I do not know	8.33%	16.67%	0.00%
Total	5.00%	8.00%	16.00%

In terms of the relationship between organization size and, participants reporting if workplace stress influences their home life, a large percentage scored in the high aggregrate range. Further to this indication, 0% of members in a large organization fo 1000-2000 reported a low score for this question, indicating a strong propensity to agree with the statement. This indication might be the result of higher pressures in a formalized environment that is characteristic of larger organizations. Demand to maintain status, growth and, perform may be higher in larger organizations, with smaller ones have a more clear communication channel with superiors, added supports of colleagures, since the environment may be more congenial and, personal. MTCT suggest that small businesses offer a more personal work ecosystem with realistic and, meaningful impact for change and, much flexibility. (MTCT, 2024).

Figure 4.3.3-7 Responses by Job Type

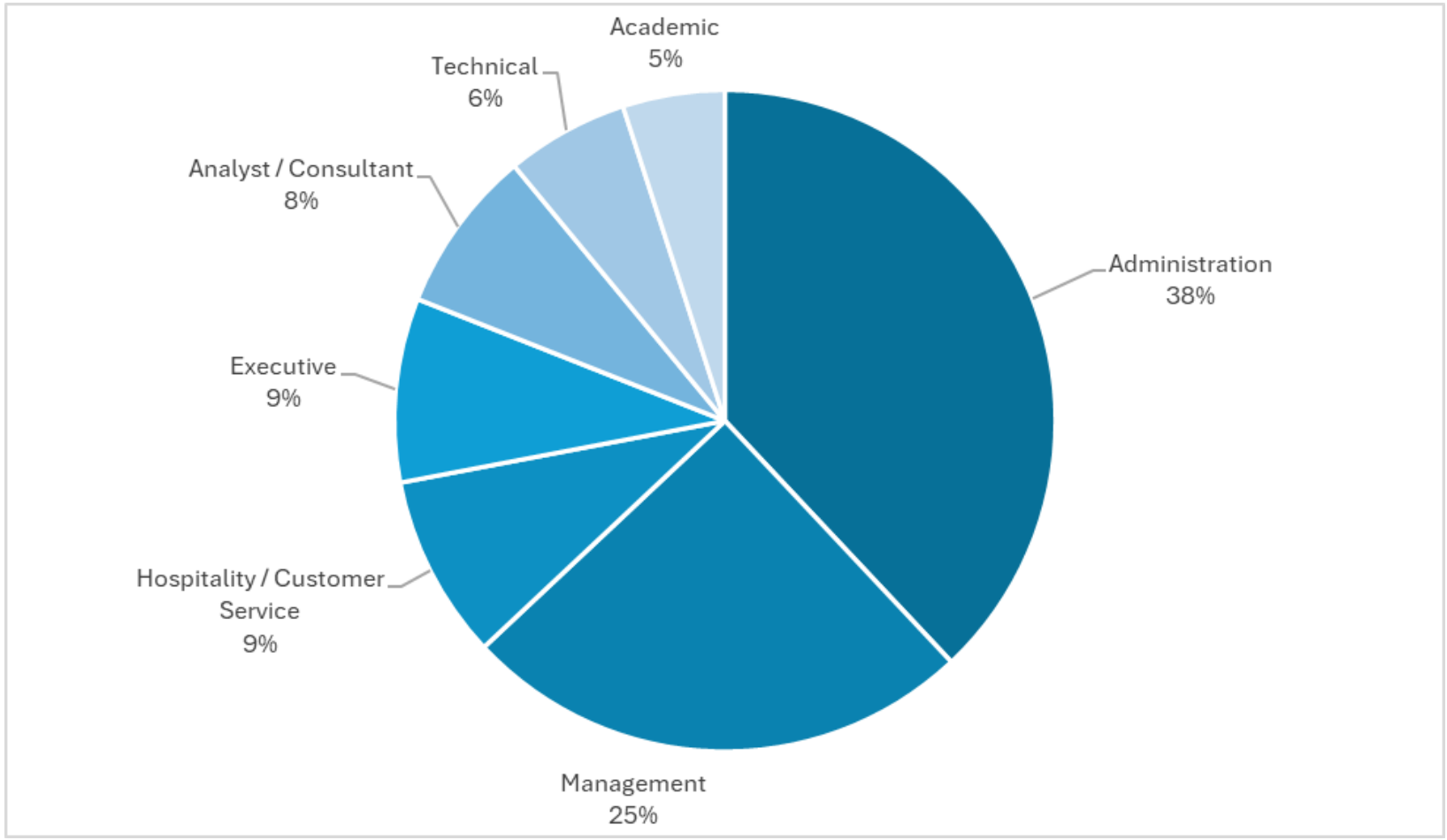

Table 4.3.3-7 Responses by Job Type

Job Type	*n*	%
Administration	38	38.00%
Management	25	25.00%
Hospitality / Customer Service	9	9.00%
Executive	9	9.00%
Analyst / Consultant	8	8.00%
Technical	6	6.00%
Academic	5	5.00%
Total	**100**	**100.00%**

See Appendix H for details about specific job titles.

A majority of respondents report having an administrative role in their organization, with management being the second most reported job type. Other job types include a representative segment of the workplace population. It should be noted that the scope of this research study did not reach out to individuals with industrial or maintenance job types. This is due to the author not having a network of potential participants who are members of the particular group. Future and, further elaborative studies can gather and, analyse evidence to assess the value of virtual reality experience to help with workplace stress mitigation.

It should be noted that the high degree of participation by administrative and, managerial roles provides more quality insights into the extent to which organizations recognize and, provide support for workplace stress. This is due to the fact that administrative roles most likely administer programs, are more likely to identify such stress and, are directly in contact with front-line staff. The high level of participation by management roles is important, as this group is a key to providing approval and, resources to help with workplace stress, starting with putting it on a strategic agenda.

Figure 4.3.3-8 Responses by Industry

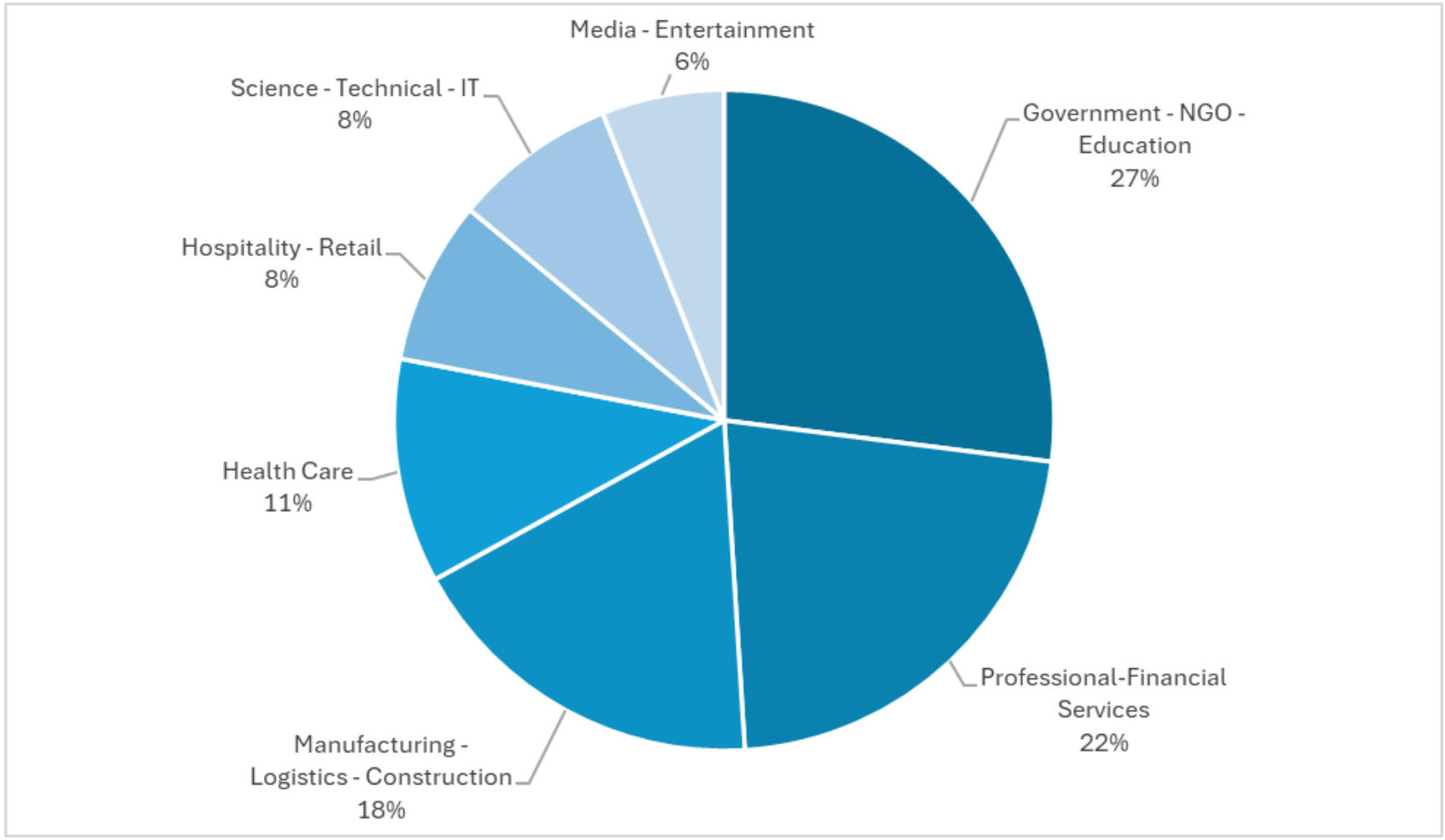

Table 4.3.3-8 Responses by Industry

Industry	*n*	%
Government - NGO - Education	27	27.00%
Professional-Financial Services	22	22.00%
Manufacturing - Logistics - Construction	18	18.00%
Health Care	11	11.00%
Hospitality - Retail	8	8.00%
Science - Technical - IT	8	8.00%
Media - Entertainment	6	6.00%
Total	**100**	**100.00%**

Participants are represented by membership in a variety of industries, with governmental/non-profit, professional services, manufacturing and, health care being the most participative. This pattern of participation is a result of the nature of the network the author has, which includes referral to others outside of the network, but people in the network. There is not significant impact on this study related to membership in a particular industry group, however it should be noted that governmental and, professional services agencies most likely have a higher affinity with recognizing and, promoting workplace stress programs. In a recent study, the health care industry reported the highest level of workplace stress, with education (governmental) and, hospitality in the top three. (Burton, 2024).

Figure 4.3.3-9 Responses by Years in Profession

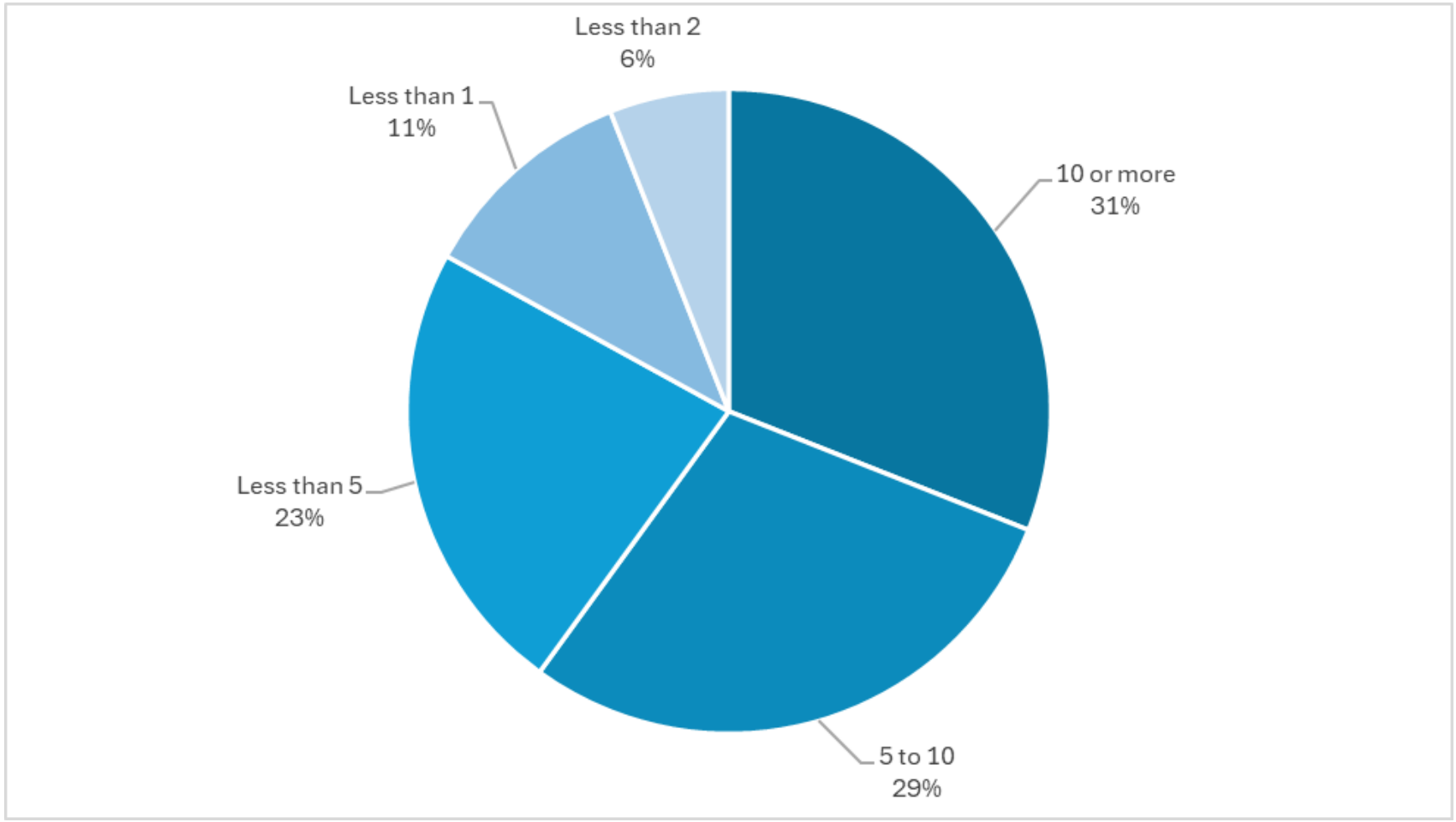

Table 4.3.3-9 Responses by Years in Profession

Years in Profession	*n*	%
10 or more	31	31.00%
5 to 10	29	29.00%
Less than 5	23	23.00%
Less than 1	11	11.00%
Less than 2	6	6.00%
Total	**100**	**100.00%**

Participants who have worked in their profession for the greatest number of years represent the most responses, with those having 5 or more years, representing 60% of the population. It is suggested that low participation by those with lower service years is a result of not having achieved affinity with the profession, job or workplace in general. Thus, with less seniority might not have had the time to assess and, evaluate the balance between building a career, entering the profession and, recognizing issues such as workplace stress that might impede their advancement.

As participants develop tenure in their profession, it is likely that they are more comfortable with recognizing personal association with the negative effects of their occupation, leading to an understanding and, affinity with the idea of workplace stress. Research indicates that older adults tend to cope with workplace stress better than younger ones. (Medaris, A., Poon, C., 2023). This might lead to a greater chance of reporting this type of stress and, general participating in studies such as this. It should also be noted that the network that the author promoted the study to has approximately 35% membership representative of recent graduates. In this case, recent would mean those with a college graduation within 3 years of the study.

Figure 4.3.3-10 Responses by Organization Size

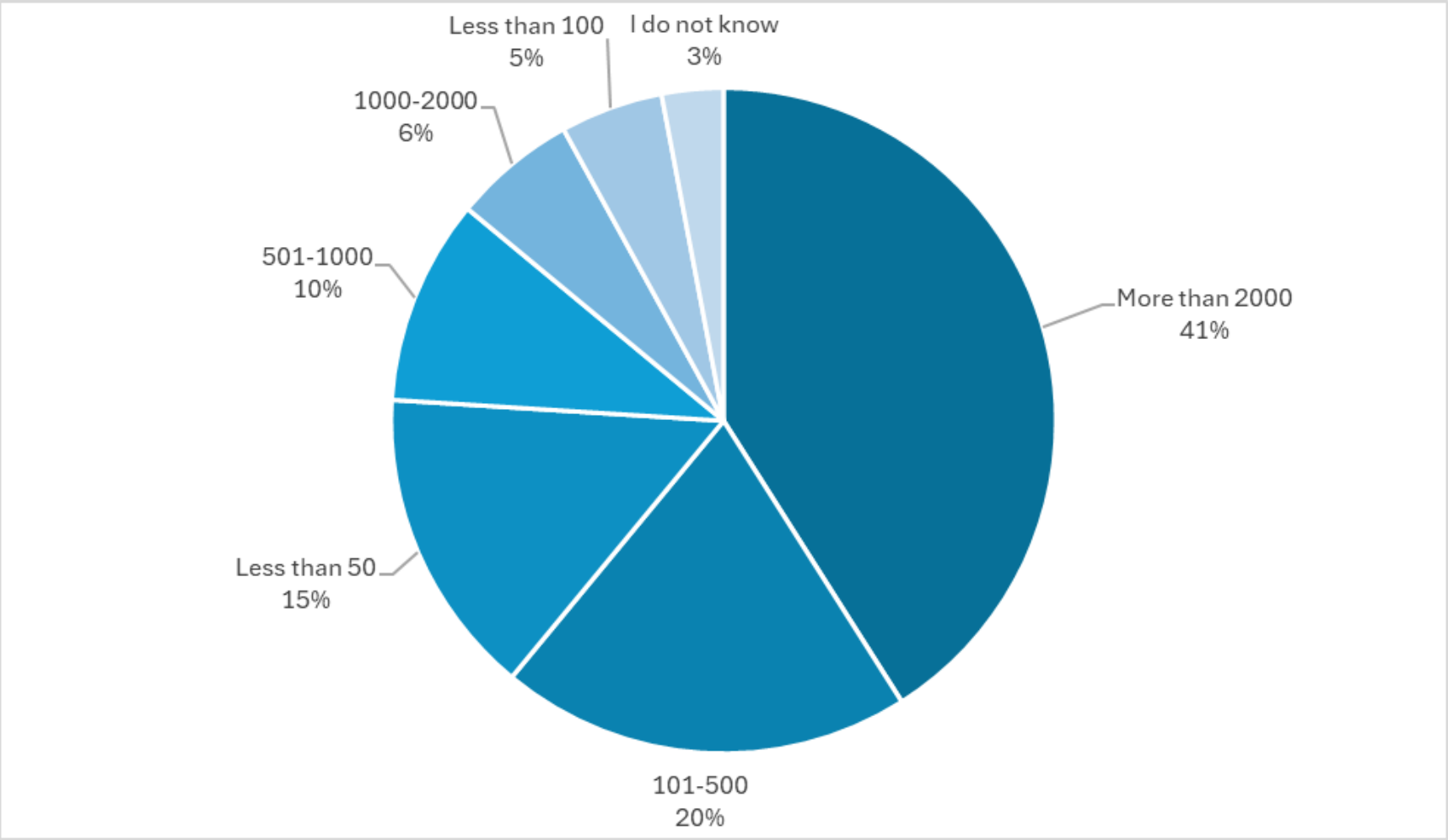

Table 4.3.3-10 Responses by Organization Size

Size of Organization	*n*	%
More than 2000	41	41.00%
101-500	20	20.00%
Less than 50	15	15.00%
501-1000	10	10.00%
1000-2000	6	6.00%
Less than 100	5	5.00%
Unsure	3	3.00%
Total	**100**	**100.00%**

The reported data indicates that a large number of respondents work for organizations that include 2000 or more staff. Further to this, this is not pattern in terms of size of organization and, participation. Since 41% of respondents are a part of very large organizations, it can be thought that the largest organizations operate in a culture where participation in studies is accepted and, important.

Figure 4.3.3-11 Responses to ‘My organization takes workplace stress seriously & has programs in place to help me’. 10-Strongly Agree, 0-Strongly Disagree.

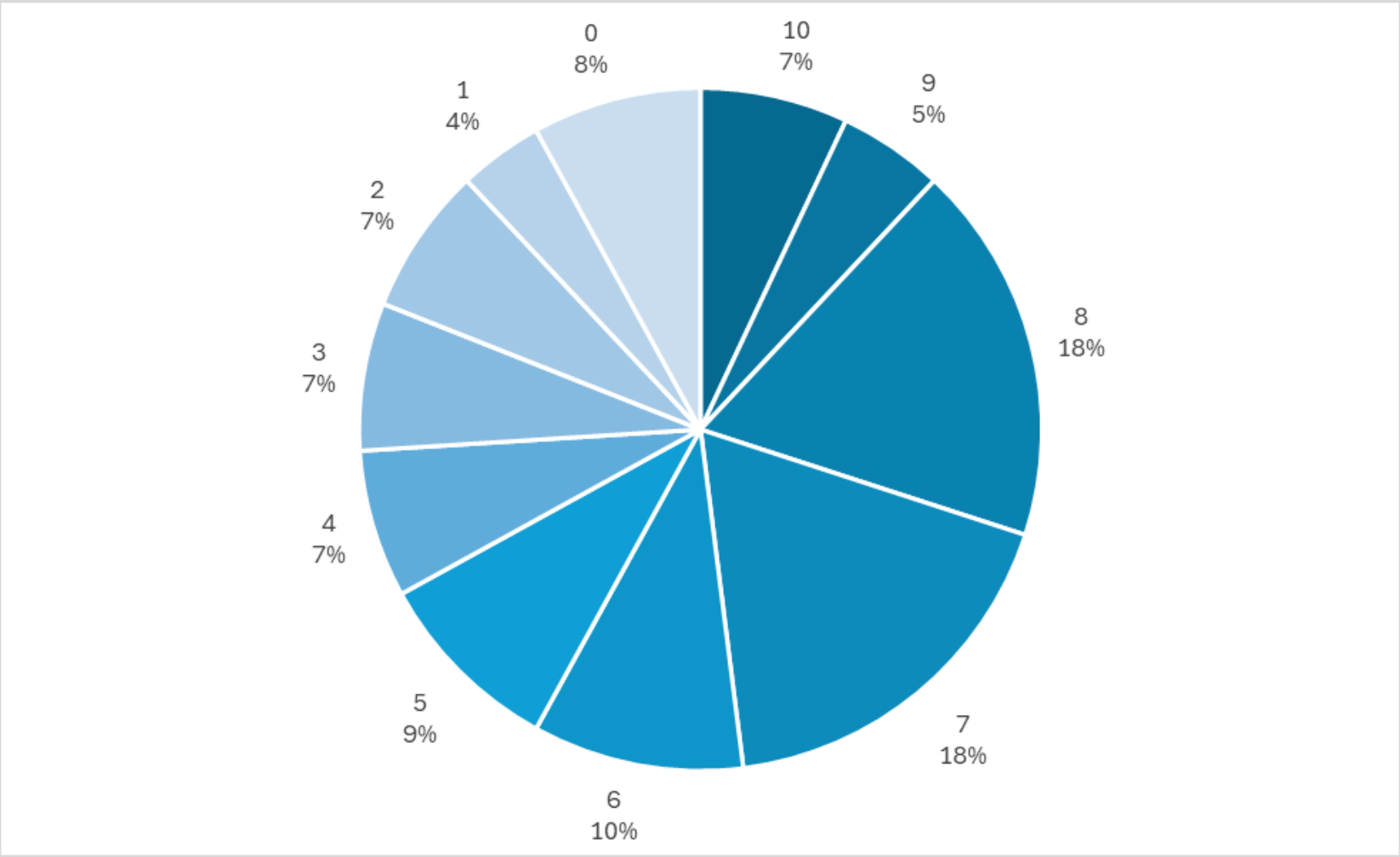

Table 4.3.3-11 Responses to ‘My organization takes workplace stress seriously & has programs in place to help me’. 10-Strongly Agree, 0-Strongly Disagree.

Score	*n*	%
10	7	7.0%
9	5	5.0%
8	18	18.0%
7	18	18.0%
6	10	10.0%
5	9	9.0%
4	7	7.0%
3	7	7.0%
2	7	7.0%
1	4	4.0%
0	8	8.0%
Total	**100**	**100.0%**

0-3	4-7	8-10
Low	Mid	High
26.00%	44.00%	30.00%

Participants, when asked how seriously their organization takes workplace stress and, provides programs to help, most reported a high score. To recognize that individual participants might not want to quantify their response with a definitive high score, the largest number of people reported a mid-score of 4-7. This finding is line with a study conducted by The American Psychological Association that reported a majority (77%) of workers are very or somewhat satisfied with how their employers are helping with workplace stress. (APA, 2023). This is not to suggest that the organizations reported are doing a superior job with workplace stress, however is an indication that the participant

does not want to commit to a high score because there is room for improvement. The case might also be that the participant does not know how to characterize the highest level of recognition by the organization or their provision for programs to help with such stress. This may result in survey response bias. (Kulas, 2018). This may lead to misleading approximations of true measures. (Tesio, 2023). This can prove to be a limitation to this study and, remedied with future research, with more elaborate orientation about the question.

The lowest scores were given by 26% of the population. This is significant to this study because it is an indication that much more can be done in many organizations, or indicate that there is a lack of understanding about workplace stress and, mechanisms to help with it. This segment of the population should provide the most insights into the effectiveness of virtual reality to help mitigate workplace stress. Murphy states “When employees give low scores on a survey, they're de facto telling leaders that they still care enough about the company to try to make changes.”. Low scores are an opportunity to recognize where improvements can be made to the organization. (Murphy, 2023).

Figure 4.3.3-12 Responses to ‘Workplace stress influences my at-home life (including relationships)’. 10-Strongly Agree, 0-Strongly Disagree.

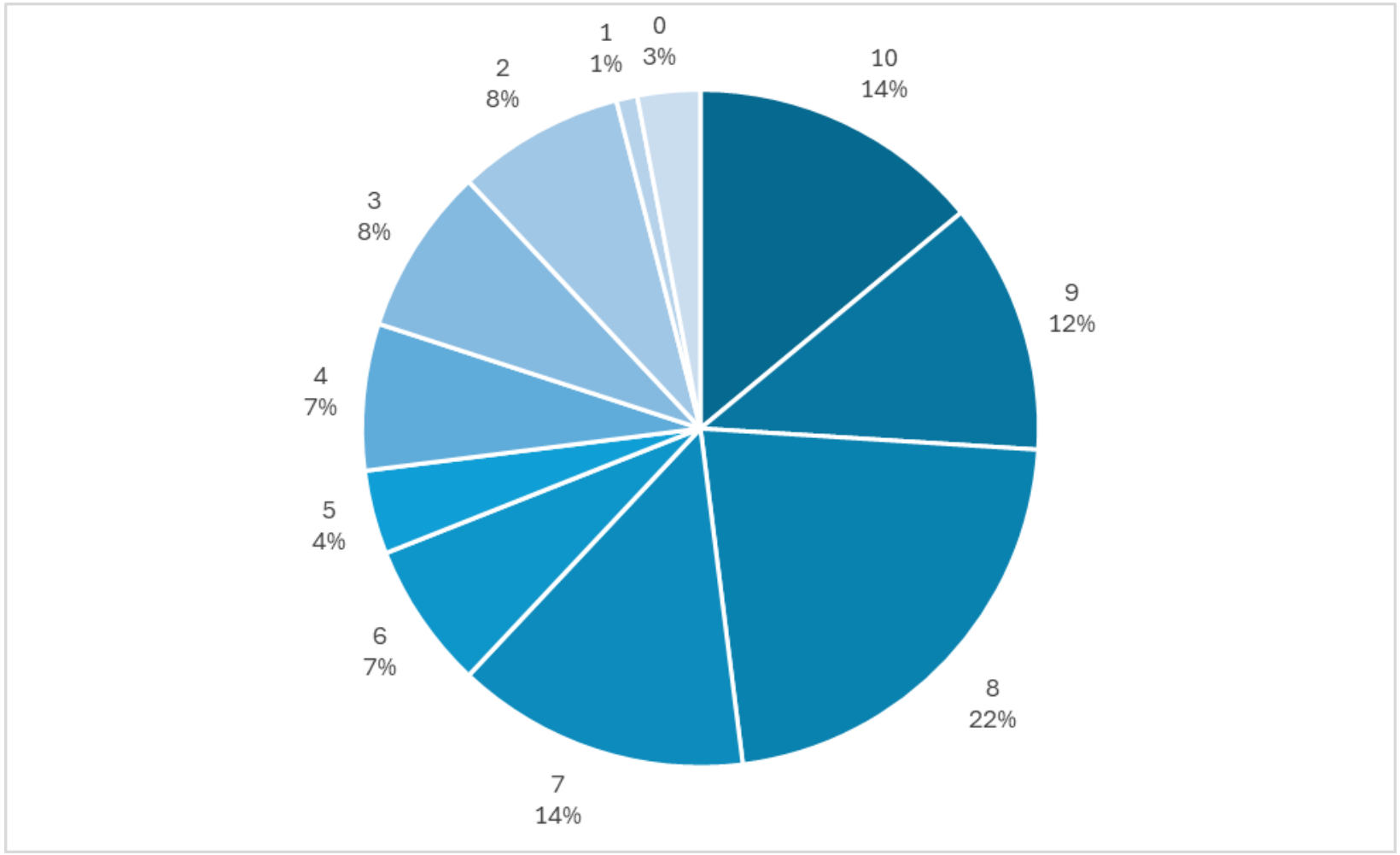

Table 4.3.3-12 Responses to 'Workplace stress influences my at-home life (including relationships)'. 10-Strongly Agree, 0-Strongly Disagree.

Influence on At-Home Life	*n*	%
10	14	14.0%
9	12	12.0%
8	22	22.0%
7	14	14.0%
6	7	7.0%
5	4	4.0%
4	7	7.0%
3	8	8.0%
2	8	8.0%
1	1	1.0%
0	3	3.0%
Total	**100**	**100.0%**

0-3 Low	4-7 Mid	8-10 High
20.00%	32.00%	48.00%

When asked if workplace stress affects their personal or home life, almost half, or 48% of participants provided a high score of 8-10%. Combined with a mid-score of 4-7, which might represent some that are not willing to commit to a higher score due to lack of understanding or affinity with the issue, there is substantial evidence of the need to do more to help with workplace stress.

Figure 4.3.3-13 Personal Association With Effects of Workplace Stress

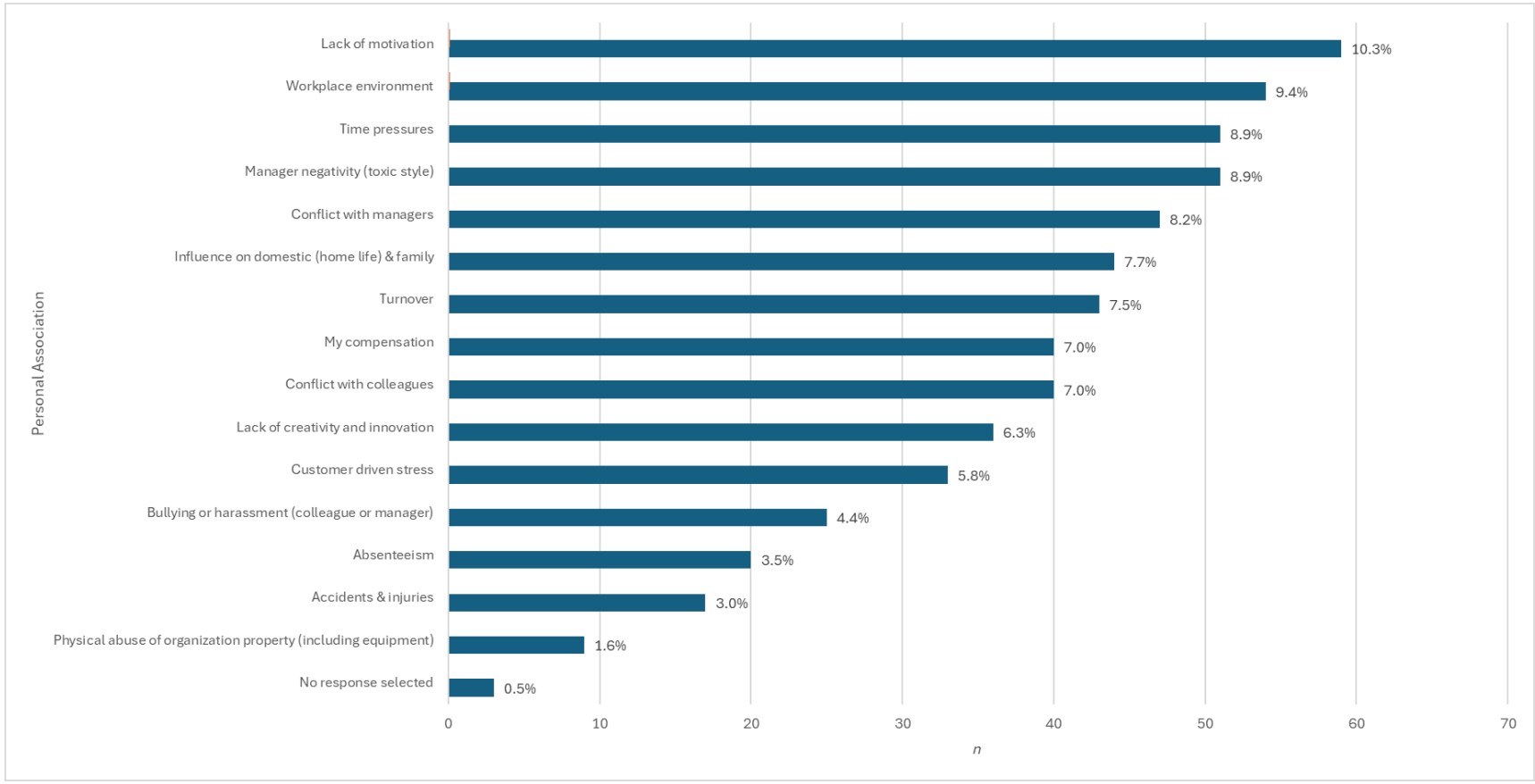

Table 4.3.3-13 Personal Association With Effects of Workplace Stress

Personal Association	*n*	%
Lack of motivation	59	10.3%
Workplace environment	54	9.4%
Time pressures	51	8.9%
Manager negativity (toxic style)	51	8.9%
Conflict with managers	47	8.2%
Influence on domestic (home life) & family	44	7.7%
Turnover	43	7.5%
Conflict with colleagues	40	7.0%
My compensation	40	7.0%
Lack of creativity and, innovation	36	6.3%
Customer driven stress	33	5.8%
Bullying or harassment (colleague or manager)	25	4.4%
Absenteeism	20	3.5%
Accidents & injuries	17	3.0%
Physical abuse of organization property (including equipment)	9	1.6%
No response selected	3	0.5%
Total	**572**	**100.0%**

Individual personal association or affinity with workplace stress is an important element in developing an understanding of how people perceive it. When asked about specific things that participants associate with workplace stress, responses ranged in type, however dominated by lack of motivation and, elements of the workplace environment itself. Davis suggests that lack of motivation leads to negative thoughts that can get in the way of productive work. Such motivation can stem from a number of other factors. (Davis, 2022).

Participants reported 45% of the time, that workplace stress is predominantly associated with things related to the work, the workplace or managers directly. It would be stereotyped that compensation or monetary reasons would be stressful, however this was reported by only 7% of the population. It is not to suggest that lesser reported associations are lacking in importance, as things such as accidents, or interactions with customers do have to be addressed and, programs put in place by management to help mitigate these causes and, related effects.

It is believed that lack of motivation, as reported by 10.3% of respondents is widely reported as it can be derived from a number of the other associations. In the absence of defining motivation in detail, respondents might have reported this due to management style, corporate culture, job dissatisfaction, conflict with colleagues and, even compensation. Future and, further research might provide more detailed and, focused insights into what motivation is and, how it impacts workplace stress. For the purposes of this study, if after being exposed to coping tools such as virtual reality experiences, results in the improvement in motivation, then there would be evidence that further research needs to be done.

Figure 4.3.3-14 Coping Options Offered by Organizations

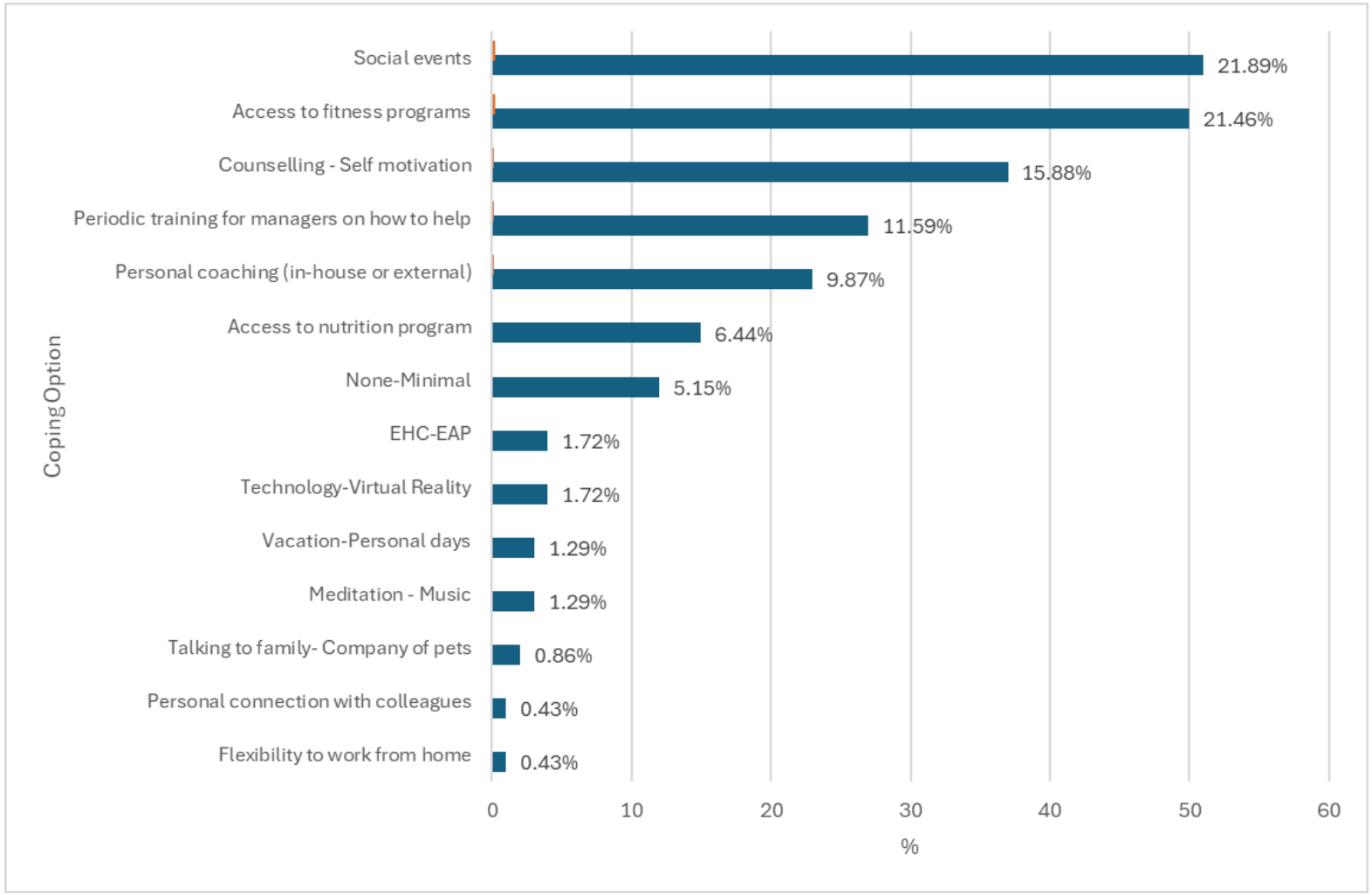

Table 4.3.3-14 Coping Options Offered by Organizations

Coping Options Used	*n*	%
Social events	51	21.89%
Access to fitness programs	50	21.46%
Counselling - Self motivation	37	15.88%
Periodic training for managers on how to help	27	11.59%
Personal coaching (in-house or external)	23	9.87%
Access to nutrition program	15	6.44%
None-Minimal	12	5.15%
EHC-EAP	4	1.72%
Technology-Virtual Reality	4	1.72%
Meditation - Music	3	1.29%
Vacation-Personal days	3	1.29%
Talking to family- Company of pets	2	0.86%
Flexibility to work from home	1	0.43%
Personal connection with colleagues	1	0.43%
Total	**233**	**100.00%**

Organizations, or all sizes, industries and, with varying styles, think of workplace stress as not important at all to extremely important (Table 4.5). As a result of this varying attitude towards workplace stress, which includes the recognition and, understand of, organizations offer programs that may help with the mitigation of such stress. It is not to suggest that all organizations offer such programs or have policies in place to help employees. Organizations to do offer some type of programs to help employees mitigate workplace stress are most likely larger and, participate in service-oriented industries. It is interesting to note that the results of this survey are contrary to a study done by Statistics

Canada which reports that workplace stress is more frequently caused by workloads and, balance with the personal life. (Statistics Canada, 2023).

Participants reported a variety of programs or policies offered by their organizations to help with workplace stress. Softer programs that are not considered clinical or direct intervention in nature dominate the responses with a rate of 59.23%. These soft programs include the availability of social events, fitness or wellness programs and, self-help counselling. The Canadian Centre for Occupational Health and, Safety report that there are many causes of workplace stress, so the strategies used also vary. (CCOHS, 2024).

Other program options include direct access things such as changing how managers manage, personal coaching (job related), nutrition subsidies to increased leisure time. These lesser reported programs are as important to helping employees cope with workplace stress as the more dominant ones, however the current participant population has reported as such. It should be noted at a significant 5.15% of participants reported that their organization offers none-to-minimum programming to help them. The World Health Organization, in a report suggest that organizational culture is key to how or if a firm helps employees with workplace stress and, that such culture determines how such problems are recognized and, dealt with. (Leka, 2003).

Figure 4.3.3-15 Personal Reasons for Experiencing Workplace Stress

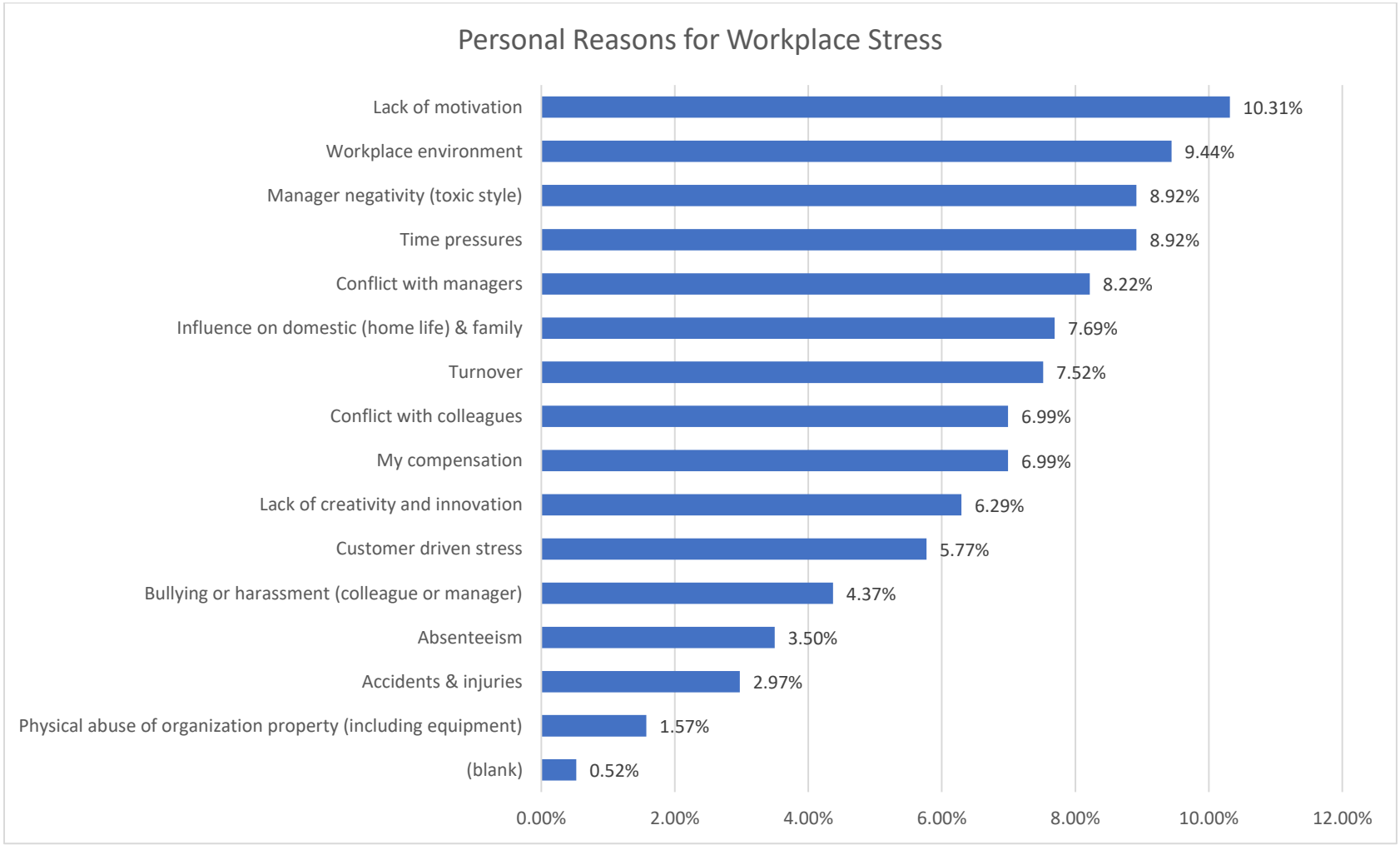

Table 4.3.3-15 Personal Reasons for Experiencing Workplace Stress

Reason for workplace stress	*n*	%
Lack of motivation	59	10.31%
Workplace environment	54	9.44%
Time pressures	51	8.92%
Manager negativity (toxic style)	51	8.92%
Conflict with managers	47	8.22%
Influence on domestic (home life) & family	44	7.69%
Turnover	43	7.52%
Conflict with colleagues	40	6.99%
My compensation	40	6.99%
Lack of creativity and, innovation	36	6.29%
Customer driven stress	33	5.77%
Bullying or harassment (colleague or manager)	25	4.37%
Absenteeism	20	3.50%
Accidents & injuries	17	2.97%
Physical abuse of organization property (including equipment)	9	1.57%
(blank)	3	0.52%
Total	**572**	**100.00%**

As indicated by the response data, 10.31% of participants reported that a lack of motivation is a primary reason for workplace stress. This study recognizes the limitation of the label of motivation, and, lack of definition of it. Motivation, from a personal perspective, can be connected to any of the other response types. A participant might develop stress because they are undermotivated by lack of compensation, conflict, ambiguity, fatigue, etc.

Looking at the other high response reasons, the workplace environment or hygiene factors is the second most frequently reported reason. Shin states, "…job stressors stemming from unfavorable work conditions can be considered as hygiene

factors that cause job dissatisfaction. This is because poor work conditions, such as heavy workloads, limited resources, and, dysfunctional equipment, can lead to employees' job dissatisfaction." (Shin, 2020).

Together with time pressures and, issues with the manager, these are the most significant reasons for developing workplace stress. It is possible that a major cause of lack of motivation can be manager toxicity, negativity, bullying or conflicts when them. In a study by the BJ Psych Bulliten, Bhui indicated that participants in a workplace stress survey indicated that negative working conditions and, practices by management, including unrealistic requests, unfair actions, lack of support and, breadth of decision ability are significant contributors to work stress. (Bhui, 2016).

It should be noted that conflict with colleagues (not direct reports) and, issues with compensation levels were also reported to a significant level by participants. It should also be noted that this survey was conducted during several months in 2024, in a Canadian context. This period within the economic timeline is characterized by unusually elevated levels of consumer price inflation, which may result in the perception of otherwise adequate compensation to be perceived as lacking. "Canadians continue to feel the negative impacts of high inflation…". (Bank of Canada, 2024).

Table 4.3.3-16 Open Ended (Other) Reasons for Workplace Stress

When asked for reasons for experiencing workplace stress, other than the pre-filled ones in the survey, respondents provided further evidence. Appendix I outlines the unedited comments provided. Although similar to the pre-filled list, respondents indicated some unique such as;

Workload,	Work-Life Balance,	Fulfillment,
Communication,	Training,	Gossip,
Burnout,	Turnover,	Harassment,
Toxic,	Expectations,	Rising Demands,
Conflicts,	Leadership,	Cultural Influences,
Management,	Health,	No Incentives,
Job Security,	Underpaid,	Poor Compensation,
Negativity,	Policy,	Systemic Issues,
Overwork,	Exclusion,	Flexibility,
Uncertainty,	Micromanagement,	Performance Reviews,
Bullying,	Meetings,	Administrative Work,
Culture,	Resource,	Recession,
Compensation,	Motivation,	Pressure,
Lack of Direction,	Guidelines,	Professional,
Growth,	Professionalism,	Atmosphere,
Support,	Outdated,	Micro aggression.

Of the unique sentiments submitted in the open-ended question, unique appear, such as;

- Bullying,
- communication,
- burnout,
- toxic,
- culture,
- exclusion,
- micromanagement,
- micro aggression,
- systemic issues,
- performance reviews.

It should be noted that individual understanding and, experience with the words provided in this section do not necessarily reflect the sentiment of a majority or a significant number of people. Individual participants reflect on their own experience differently and, may respond with certain bias, or provide indication of frustration that might not be influential towards or influenced by what their organization is actually doing or not doing.

4.4. Summary

The various data elements demonstrated in chapter 4 are indicative of support for the foundation hypothesis that virtual reality experiences are effective in helping cope with workplace stress. Validation of the results based on variables such as gender, age, industry, and, occupation provide information as to any patterns of acceptance, and, effectiveness of VR technology for the stated purpose.

It is noted that, with a relatively small sample size, the results, in some cases, provide general indications. These indications are of value to furthering research related to the foundational hypothesis, and, may serve as guidance to this future research.

More discussion is presented in chapter 5.

CHAPTER 5 – DISCUSSION, CONCLUSIONS AND, IMPLICATIONS

5.1. Introduction

Research must serve a purpose, and, have a sound methodology to support any findings. The purpose of the research should be of value to society in general, with benefits specific to a segment, which may be industry, government, non-governmental organizations or the public in general. Research that validates an idea, philosophy, technology or process is of importance as it can further its' use to benefit the population. Research that invalidates previous work, is as important as it moves scientific thought in a direction that defines further work that may achieve innovative outcomes.

This study is based on a purpose that serves to establish the effectiveness of specific technology to aide with the reduction of stress. Workplace stress is the focus of this study, with the idea that virtual reality technology, and, curated experiences can help with the mitigation of anxiety in this context.

The research indicates that workplace stress can have consequential implications to the individual, team, organization and, society in general. The literature has shown that individual quality of life, and, that of family members can be impacted by workplace stress. Further to this consequence, those experiencing such stress can be less productive, create a toxic workplace environment, cause accidents, be less innovative,

and, demonstrate low motivation. The impact to the economy can be detrimental if not dealt with.

Research also indicates that there are many ways that workplace stress is dealt with. Many approaches are traditional, such as meditation, holistic approaches, medication, and, intervention by qualified therapists. The research also shows us that many organizations do not provide mechanisms or programs to help their employees cope with workplace stress, do not do enough or anything to eliminate or limit the triggers of workplace stress. It is not to say that many organizations do have programming in place to help employees with such stress, but literature indicate that this is existent in larger organizations that have resources to do so.

Virtual reality technology is not new, but is emerging rapidly in terms of the functionality it offers, and, the range of applications available. Although traditionally used for gaming, and, other entertainment purposes, virtual reality technology has the capability of distributing rich media that may be effectively used to help with stress mitigation, and, other broader applications in the personal well-being context.

This study used up to 5 virtuality experiences based on established stress reduction practices. The experiences were delivered to the participants through the use of virtual reality headsets, or by interacting on a desktop computer. All participants were provided a quiet space free from distraction and, neutral surroundings. Participants were asked to complete a pre-exposure survey to establish the extent to which workplace

stress existed in one instance that was recalled. Participants, after being exposed to the virtual reality experience, were given a post exposure survey to establish if stress was mitigated or not. Participants were also asked questions related to their perceptions about stress, and, elements related to how their respective organization helps with workplace stress. Other questions were asked to determine some demographic, and, contextual information.

This section outlines the purpose of the study and, provides a summary of findings. Future implications are also discussed in relation to the benefits the findings of this study can provide to further work in the field.

5.2. Summary

The foundational question of this study is to determine if virtual reality experiences can aide in the reduction of workplace stress. The results in section 4.3.2 indicate that it can. With a sound methodology, the study used a representative sample to test if the effects of the use of virtual reality experiences are a positive influence on workplace stress. Positive influence in this context means that it helps to mitigate workplace stress experienced by the individual participant.

The literature review found that there is support for methods used to help mitigate stress, and, indicate that workplace stress has highly consequential (negative) impact on organizations, individuals, and, society in general. The literature review provides some evidence to support the use of technology to aide with stress mitigation, however, the

existence of studies that address virtual reality is lacking, especially those that are peer reviewed works. The curated literature review does provide support for the hypothesis, and, very little evidence to negate the effect of virtual reality technology in the context of workplace stress.

The results found in section 4.3.2 indicate that with 13 (81.25%) participants, stress levels reduced after exposure to virtual reality experiences. In 2 (12.50%) cases, stress levels increased, and, 1 (6.25%) case indicated no change in stress levels. Where participants indicated an increase in stress levels or no change at all, they reported an average score of 7.67 (out of 10) when asked if they would recommend adoption of VR to their organizations. This result indicates a structural issue with the delivery of the virtual reality experiences and, the resulting effect on stress. The data from those indicating improvements in stress levels after exposure to VR provides conclusive evidence to support the hypothesis.

5.3. Implications and, Future Research

It is acknowledging that the scope of this study is limited by the questions addressed, the size of participant population, and, the nature of the virtual reality experiences. The implications can be significant, as organizations experience high costs, both monetary, and, social as a result of workplace stress. Impact on productivity, motivation, innovation, and, organizational culture can be significant. The implications of the results of this study can have wider impact to how stress is coped with. Combined with more clinical applications of virtual reality, the results can be beneficial to health

care providers, and, have direct impact beyond the workplace. Academic institutions can be impacted by the findings of this study by starting though around the use of virtual reality to help learners cope with stress. Organizations in general can use the foundational work of this study to further define what their role is in helping their staff, and, better control the effects of not doing so.

Using the evidence shown in this study to validate the primary questions, it is hoped that future research will be undertaken to explore more related, and, divergent questions to further prove the effectiveness of the use of virtuality experiences to help mitigate workplace stress. It is also of interest to see further research done in a more formal clinical setting, with a longitudinal methodology to establish reliability.

Future research should focus on additional validation of the ideas presented in this study. Further studies should also expand on these findings to explore settings outside of the workplace, and, by using a more varied set of experiences that are applied to virtual reality technology. The use of a broader range of coping techniques, more rich media, interactivity, and, agile experiences to engage with the participant in a more meaningful way. It is also suggested that future research focus on the effectiveness of such technology in relation to more detailed demographic profiles. It would be of great benefit by looking further into how virtual reality has effect on diverse populations such as ethnic, varying generations, and, those with different mental health backgrounds.

5.4. Conclusion

As outlined throughout this report, the results are in support of the primary questions and, show that the use of virtual reality technology is a sound practice in helping individuals cope with workplace related stress. As the technology evolves to provide more user-friendly form factors, more approachable price points, and, a broader range of application that can be used, the adaptation of it will be promoted. With this expansion of availability, and, accessibility, it is thought that more application developers, in conjunction with care providers, organizations, and, other entities will support the development of richer, more interactive experiences with more variety of topical content and, styles. It is anticipated, with hope, that other researchers will conduct more varied, and, in-depth studies to explore the uses of virtual reality technology for stress mitigation, and, that funding organizations become key participants in this important field.

Doing this research has been satisfying, and, engaging. I have validated what I believed to be a good idea, with universal application. This study has allowed me to become a better scientist in the sense that my approach to inquiry is more defined, and, I am more aware of that which is possible with a sense of awareness, curiosity, and, a genuine want to find solutions to help individuals, institutions, and, society in general. I am looking forward to reading research that may be conducted to further the ideas found in this study.

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APPENDICES

APPENDIX A – LETTER OF INFORMED CONSENT

Workplace Stress Pulse Survey
Letter of Information & Consent

This survey is purposed to collect information about the understanding of, attitudes towards and methods to resolve workplace stress. The data will be used as part of a broader study related to the use of virtual reality to help mitigate workplace stress. The benefits of the study are to expand the knowledge base about workplace stress, how it is defined, perceived and mitigated. The study may also benefit the potential use of technology to aid coping strategies.

The broader study titled 'The Use of Virtual Reality Experiences to Aid the Reduction of Workplace Stress' is being conducted as partial fulfilment of the requirements of the Doctor of Business Administration program supervised by Dr. Saša Petar of the Swiss School of Business and Management Geneva.

Participation is completely voluntary, and you may withdraw your consent while you are completing the survey. If you wish to withdraw during the study, simply exit the window that contains our online survey at any time and the data you provide will be deleted by the research team after we download the data. You also may decline to answer any specific questions without withdrawing from the study by leaving the questions blank. Please note that since the survey is anonymous, it is not possible to withdraw consent once the survey is submitted.

You are entitled to receive the results of the final report upon request. Requests can be made via email to ashpatelhr@gmail.com in November 2024.

Your submission and specific responses will be kept confidential and void of any personal identifiers. The submitted data will be kept for a period not to exceed 1 year (12 months), with aggregate results being published in the final paper.

Should you have any questions about this survey or the study, contact the lead investigator Ash Patel at ashpatelhr@gmail.com.

Your participation is greatly appreciated.

Ash Patel, MEd, CTDP, PHR, SHRM-SCP

APPENDIX B – EMAIL COMMUNICATION SENT TO PROSPECTIVE PARTICIPANTS – PRE AND POST-EXPOSURE SURVEY

Hello, I am conducting a study to research the effectiveness of virtual reality to mitigate workplace stress. I am requesting your participation in the study. Your involvement will help shape an understanding of workplace stress and determine to what extent alternate methods might help control it. You asked to commit about 20 minutes of your time. Attached is a consent letter for your records.

Your Unique **Code X2R**

Step 1: **Pre-Exposure Survey**	**Complete this short survey first.** **https://forms.office.com/r/Pijfp8jQm3**
Step 2: **Virtual Reality Experience**	**Get comfortable, put headphones or earbuds on.** **Think about the stressful situation that you reported in Step 1.** **Go to https://player.wondavr.com/p/ea61b44d-7fe8-4f15-abf2-046aba4c3000#Home** ***You can click and hold the mouse button down and move around the screen.*** **Click on the Red-Green Thoughts experience.**
Step 3: **Post-Exposure Survey**	**Complete this short survey.** **https://forms.office.com/r/cLPKYDyh7d**

Thank you for your participation in this important study. Final results of the study are available to you upon request. They will be completed by November 2024.

Ash Patel
DBA Candidate
SSBM

APPENDIX C – EMAIL COMMUNICATION SENT TO PROSPECTIVE PARTICIPANTS – WORKPLACE STRESS PULSE SURVEY

Hello all, I hope all is well and that you are adding value and meaning to your profession.

I am requesting that you take a few short minutes to complete a **survey related to workplace stress**. Your responses will be used as part of a broader study to see how stress is managed in the workplace, attitudes towards it and how it is characterized.

Your responses are kept strictly confidential, no personal identifying data is collected or stores. Your submissions will be kept for a period not to exceed 1 year (12 months); however, the aggregate results will be published in the final report.

By completing the survey, you are consenting, as informed, to participating in the survey. Results of the final report are available to you upon request in November 2024.

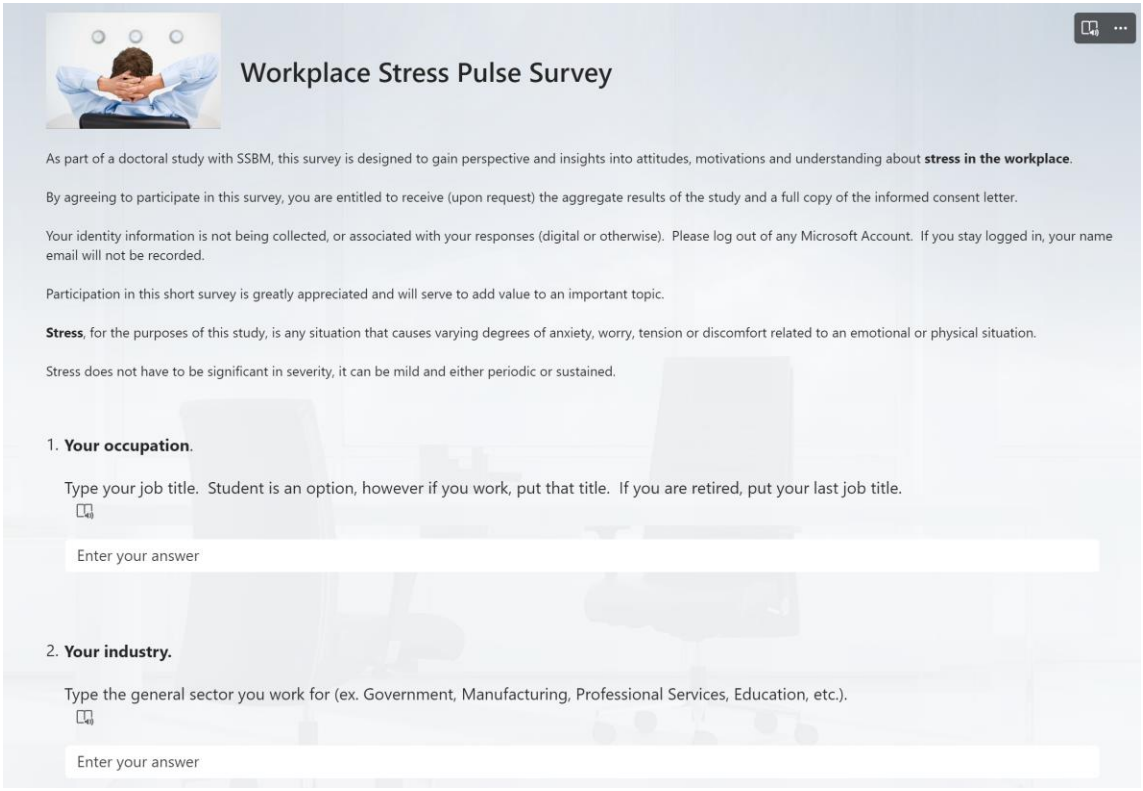
I thank you in advance for your participation and cooperation.

Attached is a formal consent letter.

SURVEY LINK

Ash Patel

APPENDIX D – WORKPLACE STRESS PULSE SURVEY DATA COLLECTION SURVEY FORM



Workplace Stress Pulse Survey

As part of a doctoral study with SSBM, this survey is designed to gain perspective and insights into attitudes, motivations and understanding about **stress in the workplace**.

By agreeing to participate in this survey, you are entitled to receive (upon request) the aggregate results of the study and a full copy of the informed consent letter.

Your identity information is not being collected, or associated with your responses (digital or otherwise). Please log out of any Microsoft Account. If you stay logged in, your name email will not be recorded.

Participation in this short survey is greatly appreciated and will serve to add value to an important topic.

Stress, for the purposes of this study, is any situation that causes varying degrees of anxiety, worry, tension or discomfort related to an emotional or physical situation.

Stress does not have to be significant in severity, it can be mild and either periodic or sustained.

1. **Your occupation**.

Type your job title. Student is an option, however if you work, put that title. If you are retired, put your last job title.

Enter your answer

2. **Your industry.**

Type the general sector you work for (ex. Government, Manufacturing, Professional Services, Education, etc.).

Enter your answer

3. **Number of years you have been working in the profession.**

- ◯ Less than 1
- ◯ Less than 2
- ◯ Less than 5
- ◯ 5 to 10
- ◯ 10 or more

4. **Size of organization.**

- ◯ Less than 50
- ◯ Less than 100
- ◯ 101-500
- ◯ 501-1000
- ◯ 1000-2000
- ◯ More than 2000
- ◯ I do not know

5. **Select all of the options that you (personally) associate with stress in the workplace.**

- ☐ Lack of motivation
- ☐ Lack of creativity and innovation
- ☐ Absenteeism
- ☐ Turnover
- ☐ Conflict with colleagues
- ☐ Conflict with managers
- ☐ Accidents & injuries
- ☐ Influence on domestic (home life) & family
- ☐ Physical abuse of organization property (including equipment)
- ☐ Manager negativity (toxic style)
- ☐ Workplace environment
- ☐ Customer driven stress
- ☐ My compensation
- ☐ Bullying or harassment (colleague or manager)
- ☐ Time pressures

6. **In addition to the options you selected in the last question (Q. 5), add points about your personal association with workplace stress.**

Enter your answer

7. **Select all options that you use (or your organization provides) to help cope with stress.**

- [ ] Counselling
- [ ] Personal coaching (in-house or external)
- [ ] Access to fitness programs
- [ ] Access to nutrition program
- [ ] Periodic training for managers on how to help
- [ ] Social events
- [ ] Technology-Virtual Reality
- [ ] Other

8. **My organization takes workplace stress seriously & has programs in place to help me.**

0	1	2	3	4	5	6	7	8	9	10

Strongly Disagree — Strongly Agree

9. **Workplace stress influences my at-home life (including relationships).**

0	1	2	3	4	5	6	7	8	9	10

Not at all — Very Much

10. Phase II of this study involves participation with actual virtual reality experiences to see how stress levels change. If you are interested in Phase II participation, please type your email address below. Your email address will not be associated with your current response.

Enter your answer

Next

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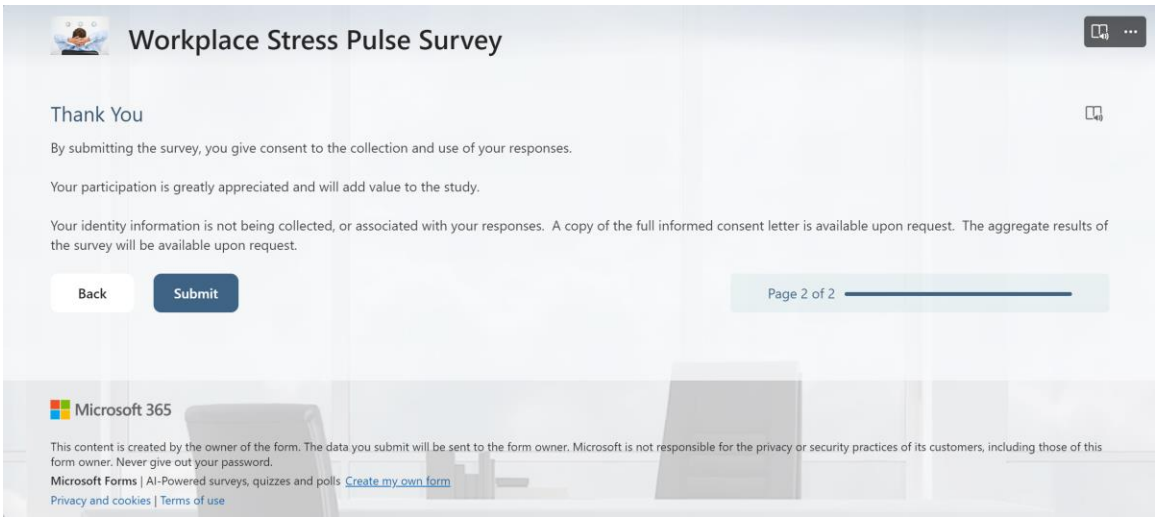
Workplace Stress Pulse Survey
Thank You
By submitting the survey, you give consent to the collection and use of your responses.
Your participation is greatly appreciated and will add value to the study.
Your identity information is not being collected, or associated with your responses. A copy of the full informed consent letter is available upon request. The aggregate results of the survey will be available upon request.
Back
Submit
Page 2 of 2
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This content is created by the owner of the form. The data you submit will be sent to the form owner. Microsoft is not responsible for the privacy or security practices of its customers, including those of this form owner. Never give out your password.
Microsoft Forms | AI-Powered surveys, quizzes and polls Create my own form
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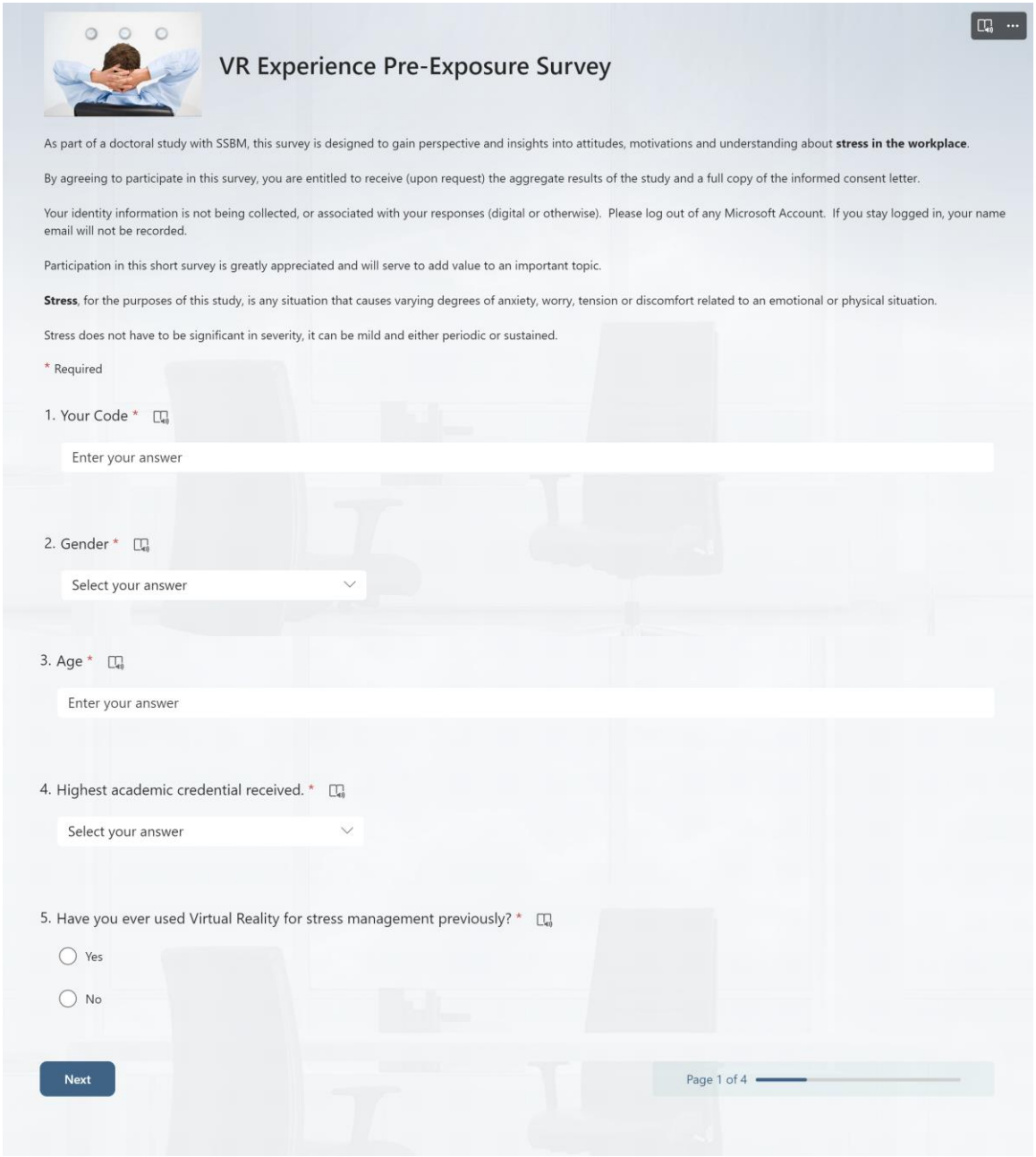
APPENDIX E– VR EXPERIENCE PRE-EXPOSURE SURVEY- DATA COLLECTION FORM




VR Experience Pre-Exposure Survey
6. Your occupation.
Type your job title. Student is an option, however if you work, put that title. If you are retired, put your last job title.
Enter your answer
7. Your industry.
Type the general sector you work for (ex. Government, Manufacturing, Professional Services, Education, etc.).
Enter your answer
8. Number of years you have been working in the profession.
Less than 1
Less than 2
Less than 5
5 to 10
10 or more
9. Size of organization.
Less than 50
Less than 100
101-500
501-1000
1000-2000
More than 2000
I do not know

10. **Select all of the options that you (personally) associate with stress in the workplace.**

- [ ] Lack of motivation
- [ ] Lack of creativity and innovation
- [ ] Absenteeism
- [ ] Turnover
- [ ] Conflict with colleagues
- [ ] Conflict with managers
- [ ] Accidents & injuries
- [ ] Influence on domestic (home life) & family
- [ ] Physical abuse of organization property (including equipment)
- [ ] Manager negativity (toxic style)
- [ ] Workplace environment
- [ ] Customer driven stress
- [ ] My compensation
- [ ] Bullying or harassment (colleague or manager)
- [ ] Time pressures

11. **In addition to the options you selected in the last question (Q. 5), add points about your personal association with workplace stress.**

Enter your answer

12. **Select all options that you use (or your organization provides) to help cope with stress.**

- [ ] Counselling
- [ ] Personal coaching (in-house or external)
- [ ] Access to fitness programs
- [ ] Access to nutrition program
- [ ] Periodic training for managers on how to help
- [ ] Social events
- [ ] Technology-Virtual Reality
- [ ] Other

13. **My organization takes workplace stress seriously & has programs in place to help me.**

0	1	2	3	4	5	6	7	8	9	10

Strongly Disagree — Strongly Agree

14. **Workplace stress influences my at-home life (including relationships).**

0	1	2	3	4	5	6	7	8	9	10

Not at all — Very Much

Back Next

Page 2 of 4

Stressful Situation

Think of a stressful situation at work or other context.

15. What was your stress (anxiety) level when you first experienced this situation? [10 is the highest].

1	2	3	4	5	6	7	8	9	10

16. Approximately how long did the stress (anxiety) last? (Affected your work or personal life).

- ◯ Less than 10 minutes
- ◯ Up to 1 hour
- ◯ Up to 5 hours
- ◯ All day
- ◯ More than one day

17. How did you resolve this stress (anxiety)? Answer NO if you were not able to resolve it within 1 hour. *

Enter your answer

18. Did this episode of stress (anxiety) have an impact on your daily life (work or personal). *

- ◯ Yes
- ◯ No

Back Next

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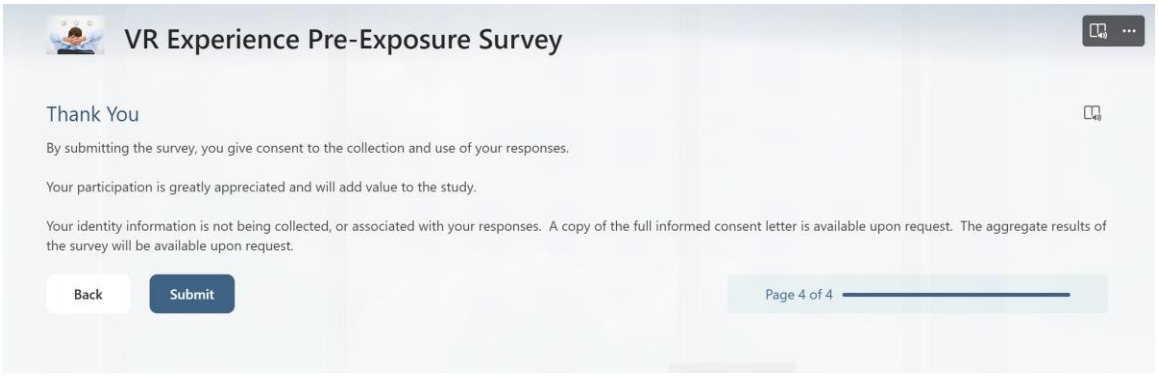
VR Experience Pre-Exposure Survey
Thank You
By submitting the survey, you give consent to the collection and use of your responses.
Your participation is greatly appreciated and will add value to the study.
Your identity information is not being collected, or associated with your responses. A copy of the full informed consent letter is available upon request. The aggregate results of the survey will be available upon request.
Back
Submit
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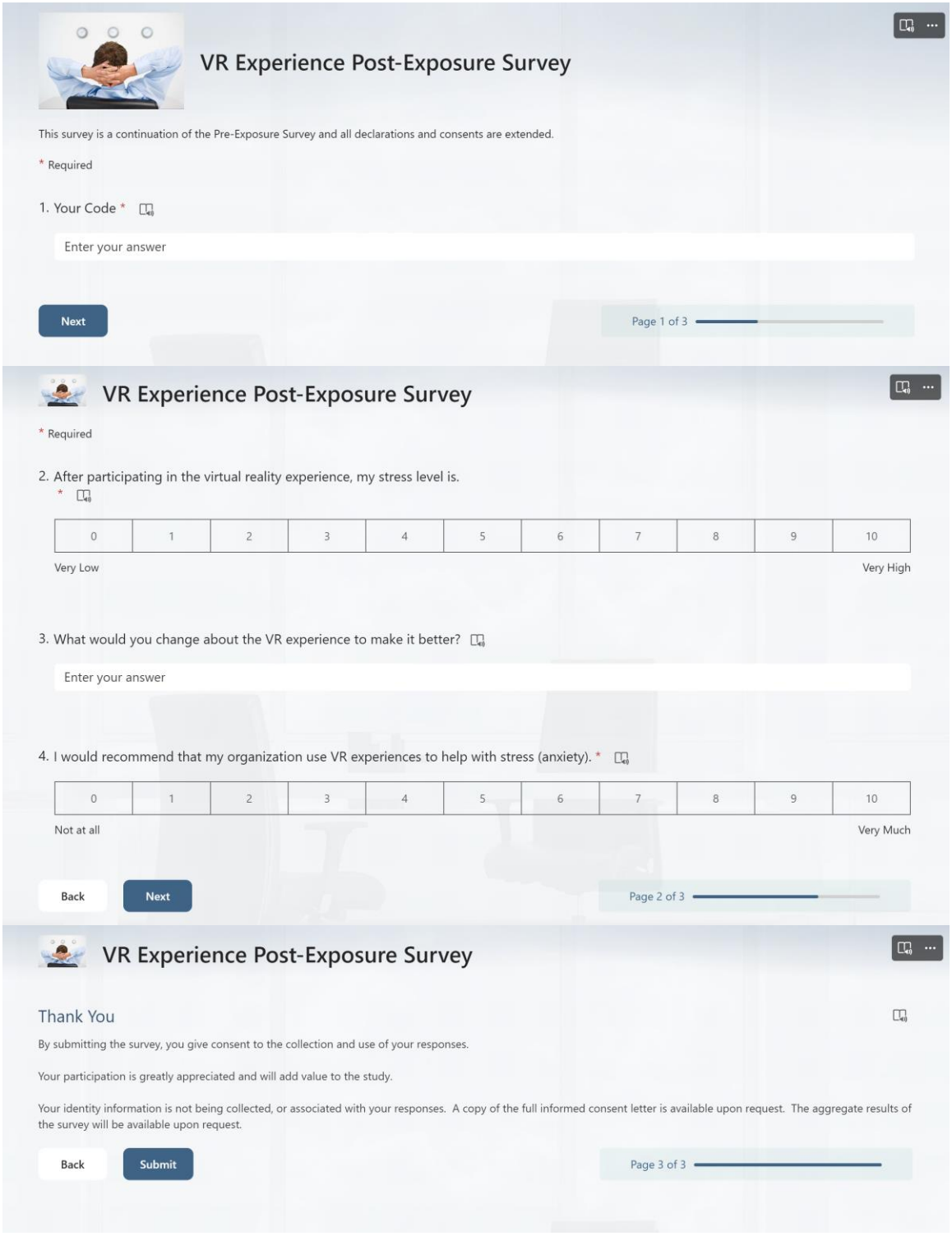
APPENDIX F– VR EXPERIENCE POST-EXPOSURE SURVEY- DATA COLLECTION FORM



VR Experience Post-Exposure Survey

This survey is a continuation of the Pre-Exposure Survey and all declarations and consents are extended.

* Required

1. Your Code *

Enter your answer

Next

Page 1 of 3

VR Experience Post-Exposure Survey

* Required

2. After participating in the virtual reality experience, my stress level is.

*

0	1	2	3	4	5	6	7	8	9	10

Very Low Very High

3. What would you change about the VR experience to make it better?

Enter your answer

4. I would recommend that my organization use VR experiences to help with stress (anxiety). *

0	1	2	3	4	5	6	7	8	9	10

Not at all Very Much

Back Next

Page 2 of 3

VR Experience Post-Exposure Survey

Thank You

By submitting the survey, you give consent to the collection and use of your responses.

Your participation is greatly appreciated and will add value to the study.

Your identity information is not being collected, or associated with your responses. A copy of the full informed consent letter is available upon request. The aggregate results of the survey will be available upon request.

Back Submit

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APPENDIX G – VIRTUAL REALITY EXPERIENCE – EQUIPMENT – MEDIA – TRANSCRIPTS

The virtual reality experiences were scripted using commonly accepted stress reduction techniques. The volunteer actors rehearsed the script several times, allowing them to develop a calming voice and, speed of delivery.

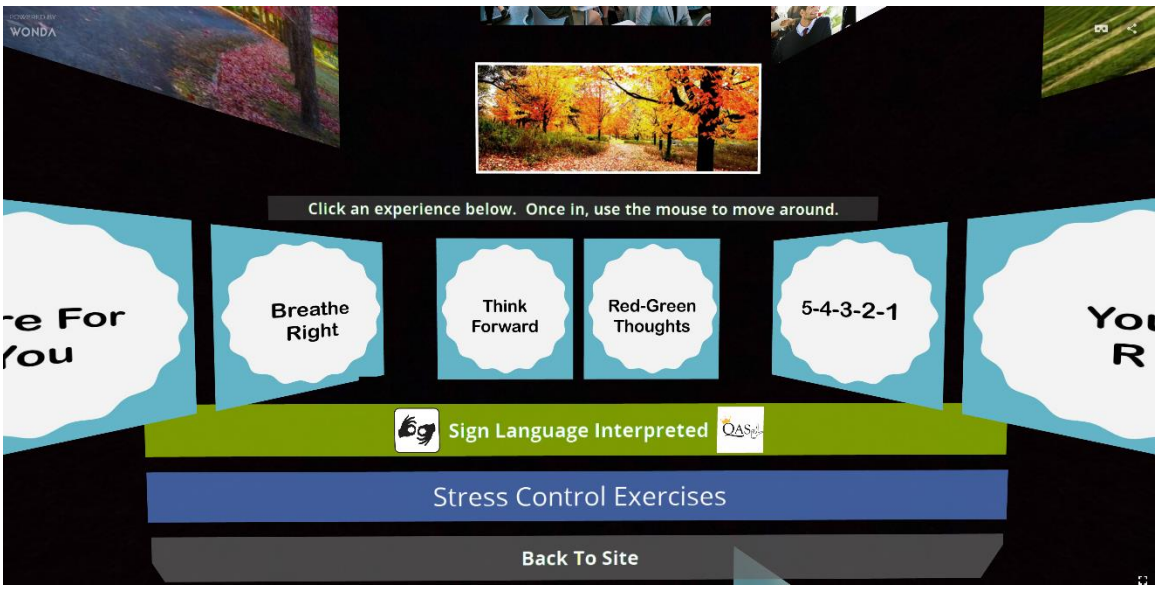
The experience video was taken using a common iPhone with a camera (light adjusted accordingly). Pre-production of video segments used Adobe Premiere video authoring software, and, Adobe Photoshop software refining images. All software is fully licensed. Production of the actual experience used the Wonda VR authoring tool.

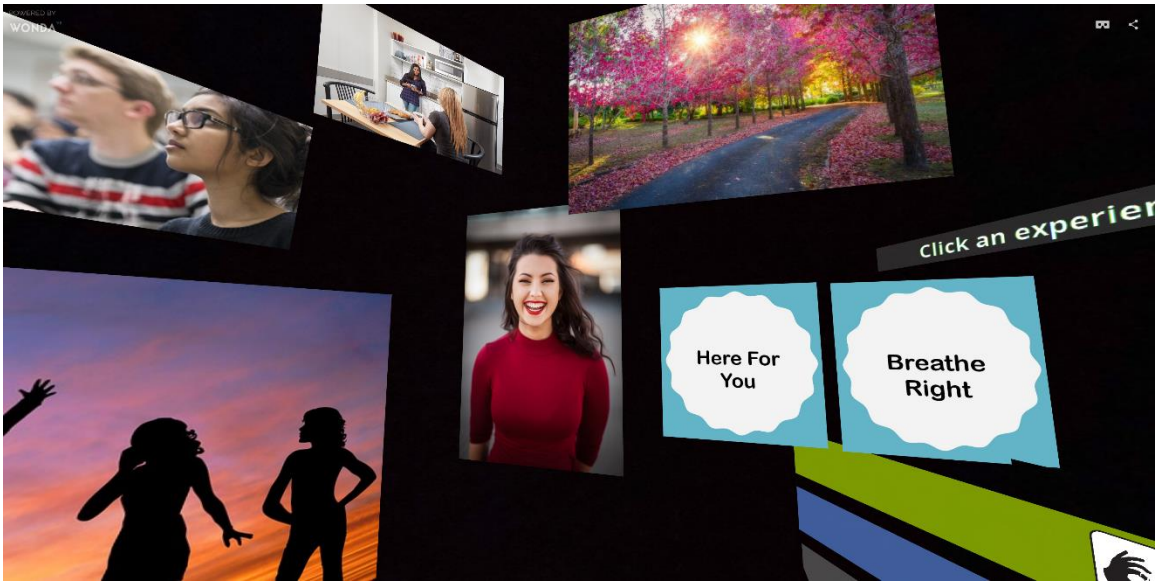
Distribution of the virtual reality experiences to the participant was done using either the Oculus (Meta) Go wireless headset, or via the Google Chrome internet browser with noise-cancelling headphones.

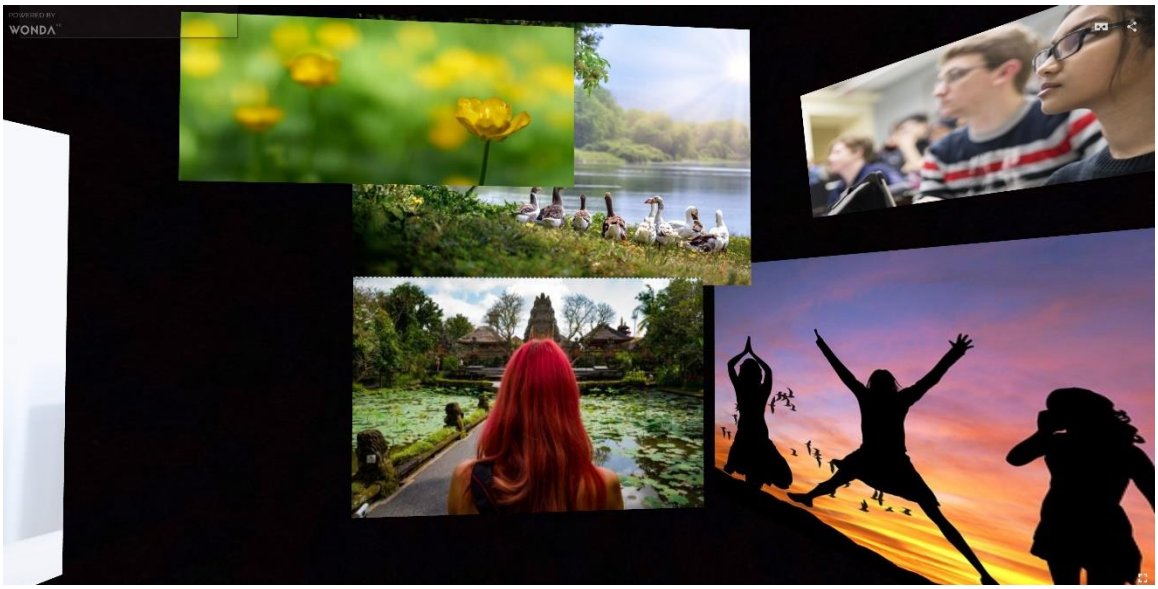
Images: CC BY SA 4.0 Creazilla

Although it is not possible to represent the virtual reality experiences through the Oculus Go headset view, several screen captures of the experiences are shown below. Each of the six experiences were produced in sign language format by a certified sign language interpreter. Consent from all actors was obtained in advance of production. Full transcripts of all experiences are included below.

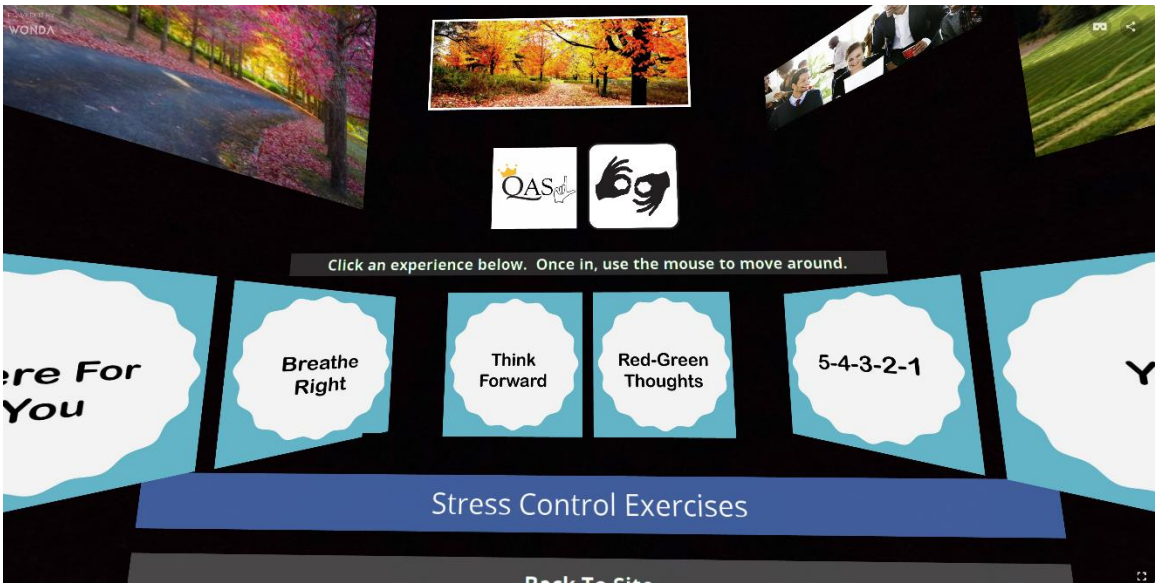
Virtual Reality Experience Screens

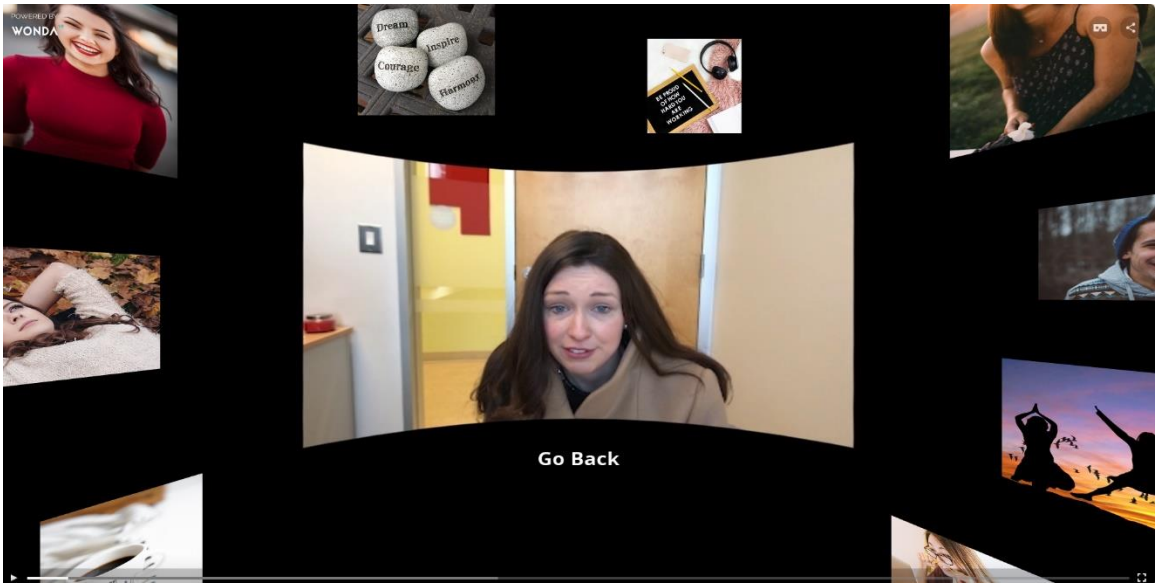




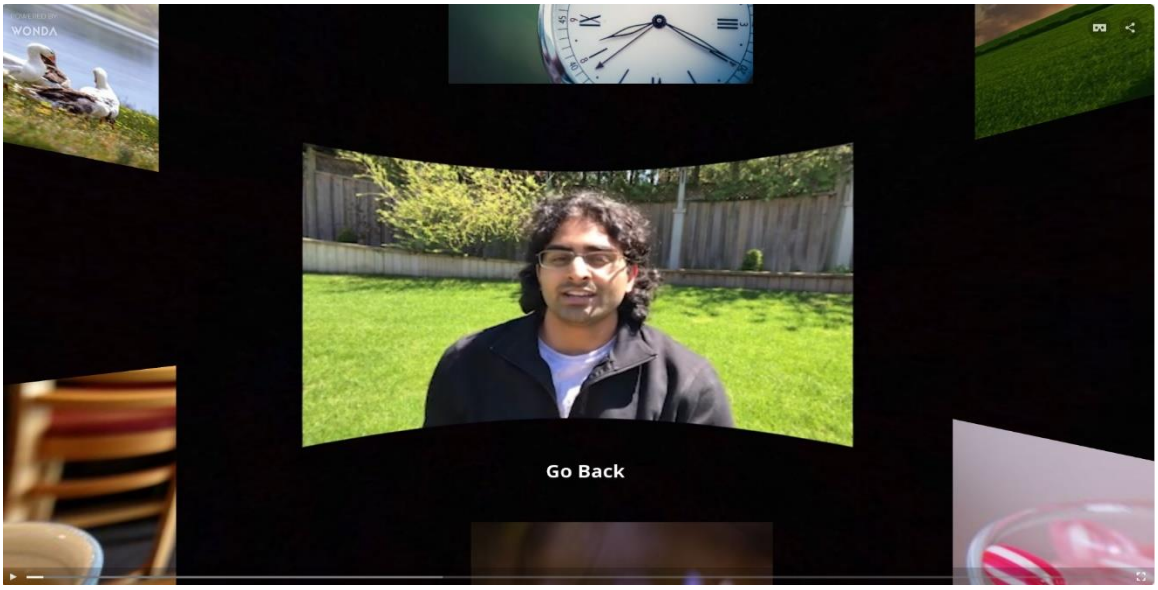

WONDA


WONDA
ouse to move around.
en
ts
5-4-3-2-1
You
R


Click an experience below. Once in, use the mouse to move around.
ere For You
Breathe Right
Think Forward
Red-Green Thoughts
5-4-3-2-1
Stress Control Exercises


Dream
Inspire
Courage
Harmony
Go Back


WONDA
Go Back


WONDA
Go Back


POWERED BY
WONDA
Go
Back


POWERED BY
WONDA
Go
Back


POWERED BY
WONDA
Go
Back


POWERED BY
WONDA
Go
Back

Transcripts

Title: Here For You

Hi, how are you doing?
Is everything okay?
Looks like you are having a tough day
We all have tough days
I am not sure if you are feeling a little down
And I know you don't know me
But I certainly have time to spend and I'd like to support you if I can
You know, sometimes when I'm having a down day
I have to look at what my thoughts are
I'm not sure if you know this but how to think decides how you feel
And how you feel decides how to act or behave
And there is a real strategy there in challenging and changing how we think
We automatically change how we feel by looking at why we are anxious

Which helps us change our behaviour or how we're acting or following through with our day
You just seemed a little down and I wondered if you were feeling a little stressed
You know being in an environment, it is natural to be a little stressed right now
You may be far from home, you may miss your family, you may feel that the workload is just overwhelming
There might be pressure of assignments and exams coming up
It's just very common that you may be feeling stressed right now
So, I thought maybe we would talk through some strategies
Have a look at the other VR experiences for some strategies
And view these often
You also have a student counselling office that I strongly urge you to visit
They have experts who can help you with more detailed attention
I think it's wonderful that you are here today
I think it is very brave of you to sit down and acknowledge that you have some support

And that is the first step

I'd like to encourage you to look at some websites that really provide strategies to cope

Remember to focus on yourself first

Also remember that you do not have to be perfect at everything

As long as you've done your best

Take care of your mind and body by eating foods that are good for us

And exercise and sleep often

Engage with other people who might or may not be experiencing the same thing as you

I want to thank you for sitting on this bench today

And I want you to know that you're not alone in feeling down, stressed, or worried

There are so many people that I see on a daily basis that are feeling just the same way that you're feeling

I want you to remember to reach out for support and keep talking to people when you need to

Access the support from your counselling office, friends, and family

Remember to challenge your thoughts and use relaxation techniques such as breathing
Take care of yourself and thank you for giving me the time to speak to you
You got this
Tomorrow is a new day

Title: Breathe Right

The other think I like to work on when my body is uptight is some deep breathing

The rule of thumb for deep breathing is that you breathe in slowly and deep and you breathe out 2 beats longer than you breathe in

So, you breath in 6 beats, you breath out 8 beats

If you breath in 4 beats, you breath out 6 beats

So, let's try it.... So, breathe in 1 - 2 - 3 - 4 ..... and breathe out 1 - 2 - 3 - 4 - 5 - 6

So, breath in 1 - 2 - 3 - 4 ..... and breathe out 1 - 2 - 3 - 4 - 5 - 6

Title: Think Forward

Time and time again, we find ourselves worrying about what is going to happen or

ruminating over what has already happened,

steering us away from the here and the now

Uncertainty and anticipation fuel our anxiety and drives our efforts to control the uncontrollable

When this occurs, our mind creates endless scenarios of

what we think will happen, causing feelings of panic and fear

Yet, more often than not, none of them turn out to be true

So, what do you do when faced with these thoughts?

Well, you bring yourself back to the present

And how do you do this?

Take a moment to ask yourself

What's happening in the present moment?

Is there an immediate threat?

Am I safe? Is there anything that I must do right now?

Asking these questions will help you realize that you are in a safe space

And as you increase your awareness of the present moment,

take the time now to question your anxious thoughts

Ask yourself: Am I mistaking a thought with a fact?

Am I assuming my view is the only outcome possible?

What are the benefits of thinking this way?

Am I overestimating things?

Am I taking something personally that had perhaps had nothing to do with me?

Am I assuming there is nothing that I can do to change my current situation?

Challenge your automatic thinking and try to think thoughtfully about possible alternative explanations

While doing this, be attentive and separate past, present, and future

Do not ask questions of the past that do not have definitive

answer and do not attempt predicting the future

You will come to realize that the worst-case scenarios

that you have created in your mind are just thoughts,

and these thoughts are what separate us from reality,

limiting our awareness of the real world

Asking these questions allows us to be mindful, that is,

in touch with reality and in touch with the present moment

Title: Red-Green Thoughts

Ok, so I have some I like to call the red thoughts and green thoughts

For every negative thought, we need at least two positive green thoughts

So, if you think of a traffic signal, you know that red means stop and red thoughts stop us from feeling confident

They stop us from feeling good about ourselves and stop us from taking healthy risks

So how we remedy that or challenge that is to use green thoughts

Green thoughts let us be successful

So, if you are feeling that I might not pass an exam, a green thought could be .... this is hard, but I know I will get through it

Another green thought might be .... I studies and I can certainly try my best

If you're thinking that people around me do not like me or I think I said the wrong thing,

Now make a list of your red thoughts and each day come up with as many green thoughts for each one of those red thoughts

Then a green thought might be .... I know I am a good person, so others do too

Everyone says stupid things, they are not a big deal to others, only me

Little things that bother me, are things that other people do not even notice or remember

Title: 5-4-3-2-1

I understand that it's been a tough day;

And it's easy to get carried away in your thoughts,

but right now, let's try to get back to the "now" with a technique called the 5-4-3-2-1 grounding exercise.

It may seem challenging with all that that's going on right now,

but when negative thoughts come to our mind,

You are simply going to acknowledge them and shift our focus back on the exercise.

To start, we are going to acknowledge five objects

that can be seen around you. These objects could be a desk, trees, pictures, or even cups.

Let's now acknowledge four objects we can touch.

You don't need to get up for this exercise. Instead,

you can feel anything that's closest to you, such as your hair, pillows on the bed or the leather on a chair

Try to focus on the way the texture feels on your hand.

Now let’s acknowledge three sounds.

But, it’s essential to focus on any noises that come from outside of our body.

So, let's not attend to our inner voice! Instead, listen to the sound of a passing car,

Or the sound of the wind, birds or rain from the outside.

Next, try to focus your attention on two distinct smells.

It can be anything from the smell of a cup of coffee to smelling a lip balm in your bag.

Finally, I want you to acknowledge one thing you can taste.

It can be a piece of gum or a cup of tea

Practicing this coping technique will help you shift your attention away

from negative thoughts, allowing for greater emotional control

It’s important to practice this technique once in the morning and before we go to sleep

so that we can really focus on shifting our attention away from negative thought to the present moment

I know you can do it so don’t give up!

Title: You R

When you find yourself feeling down or just unmotivated

one way to change your mindset is to do something creative and grounding

It can be anything that makes you feel good and focusses your attention in the moment with no pressure

I like to cook and bake. I pick an easy recipe with whatever we have at home and make it

By the time I am done, I feel like I accomplished something (even if it doesn't look like the picture)

But seriously, there so many things you can do

For example, taking some time to draw either from your own imagination or a do a tutorial

Gardening can be great too

Working with soil and flowers is a great way to ground yourself

Actually, doing anything outside is an amazing way to shift your attention and get inspiration

Painting is something that anyone can do

It doesn't even have to be about something specific, it can be abstract

Mix some colors and let your hands move the brush any way it wants

You may be surprised what you come up with

If you like more physical forms of distraction, put on the music and dance –

no has to see you and moving your body helps release stress and it feels amazing

Or use your voice and sing, make up a song, sing to your favorite artist – just let it out

Maybe think of a different exercise routine or yoga stretches

The point is – you know you

When you feel, you are starting to slip and fall into a negative mood,

start to plan and do something that will keep you in the moment and moving

Change your mindset – change your mood – change your day

You got this!

APPENDIX H – DETAILED TABLES – KNOWLEDGE ABOUT VR AND WORKPLACE STRESS SURVEY – PARTICIPANTS BY OCCUPATION

Occupation – Job Title	*n*	%
HR Business Partner	6	6.00%
HR Talent Acquisition	5	5.00%
HR Coordinator	4	4.00%
Professor	4	4.00%
HR Manager	4	4.00%
Sales Associate	3	3.00%
Manager	3	3.00%
Senior Consultant	2	2.00%
Supply Chain Manager	2	2.00%
HR Generalist	2	2.00%
Student	2	2.00%
Lead Generation Specialist	1	1.00%
Sales	1	1.00%
Production Planner	1	1.00%
Digital Marketing Management	1	1.00%
Software developer	1	1.00%
Director	1	1.00%
Nurse	1	1.00%
Director of Human Resources	1	1.00%
Project Manager	1	1.00%
Director of PMO	1	1.00%
Senior Advisor	1	1.00%
eLearning Developer	1	1.00%
Human Resources Analyst	1	1.00%
Employee relations manager	1	1.00%
Consultant	1	1.00%
Finance Manager	1	1.00%
President	1	1.00%
Franchised Business Owner	1	1.00%
Project Coordinator	1	1.00%
Grants Administrator	1	1.00%
Recruiter	1	1.00%
HEAD SHIPPER	1	1.00%
Sales coordinator	1	1.00%
High School Teacher	1	1.00%
Senior Director, Clinical Operations	1	1.00%
HR Assistant	1	1.00%
Human resources advisor	1	1.00%
Administrator	1	1.00%

Law Student	1	1.00%
Analyst	1	1.00%
Logistics Specialist	1	1.00%
HR Coordinator	1	1.00%
Model	1	1.00%
HR Director	1	1.00%
Organizational change and training consultant	1	1.00%
Benefits Manager	1	1.00%
Process Manager	1	1.00%
Business Control Analyst	1	1.00%
Contracts Manager	1	1.00%
HR Professional	1	1.00%
Project Manager	1	1.00%
HR Senior Consultant Compensation	1	1.00%
Recruiter	1	1.00%
HR Senior Director	1	1.00%
Registrar Coordinator	1	1.00%
HR Senior Specialist, Compensation	1	1.00%
Crew member/ cashier	1	1.00%
Sr strategy officer	1	1.00%
Self Employed	1	1.00%
Clinic manager, Primary Health care provider	1	1.00%
Crew Scheduler	1	1.00%
Transportation Supervisor	1	1.00%
Server	1	1.00%
Workday Lead	1	1.00%
Data analyst	1	1.00%
HR Vice President	1	1.00%
HR Specialist Total Rewards	1	1.00%
Supply Planner	1	1.00%
HR Specialist, Learning and Talent Management	1	1.00%
Vice President of Sales	1	1.00%
Administrative Assistant	1	1.00%
Advisor	1	1.00%
HR Total Rewards Specialist	1	1.00%
Total	**100**	**100.00%**

APPENDIX I – DETAILED TABLES – OPEN ENDED (OTHER) REASONS FOR EXPERIENCING WORKPLACE STRESS (UNEDITED)

- lack of buy-in to project timelines and goals - personal conflicts being brought into professional atmosphere - miscommunication resulting in conflicts and negativity - exclusionary working environment due to gender and culture
- Lack of job security
- poor communication - internal conflicts
ambiguity and uncertainty, job security
Being short staffed
Being surrounded by colleagues and clients who constantly seem to be stressed out and under pressure
burn out
Burnt out, overworked Toxic colleague bullying and harassment
Conflicts with clients (internal), bullying from clients (internal)
Expectation to do more (work-wise) with less (fewer resources)
Given that the job is in Hong Kong, it has a lot of unique cultural influences; as such, the biggest being white worshipping (a major EDI component) in a lot of work environments in Hong Kong.
I associate workplace stress with above but that doesn't mean I am experiencing that at work.
I definitely find it harder to sleep, it exacerbates my heart health. I definitely eat more to cope with the stress and overall I am becoming more overweight over time which is bad because I was diagnosed with a genetic heart condition.
I experience very low amounts of stress in my current workplace (in fact close to none) because my immediate supervisor (academic chair), my direct reports (professors), and my horizontal team (professors, support staff, other administrators) are awesome. I compare this workplace experience to several other workplaces in my past where various elements I noted in Q5 were present.
I hate working with negative thinkers. Gossip, complaining and bitching is reflection of a fixed mindset

I think I covered them
In my workplace, we often have a lot of turnover as the field employs and depends on current students and recently graduated student. Since new employees will often enter the educational field with a limited background, there is often a small set of experienced employees that tend to look down and make fun of the new employees.
Incongruence of policy. For example, HR coaches others in the workplace to treat employees with respect, but fails to do the same for it's own team.
Increasing workload on same salary
Internal (threat of layoffs; deadline/time pressure; unclear directions; impossible/lofty deliverables) External (customer relations; job market scarcity; recession)
Issues with work-life balance
It feels as if there is no moving up in the ladder of some companies and there is definitely not a lot of motivation from the upper management
Job security as the global team streamlines Manager is not hands on and I end up doing all the work and hers
Lack of direction from leadership team
Lack of growth opportunities and lack of a healthy competitive environment due to seniority rather than merit
Lack of guidelines/expectations
Lack of motivation can be the biggest stress for any employee. Conflict with the manager & colleague often leads to negative environment leads to stress, which can impact the individual & overall organization performance too. Low Compensation often leads to stress as employee feels demotivated & they always feel that they are underpaid as per industry standard.
Lack of Performance Reviews/ Appraisals
Lack of training
Largest challenge is how to communicate without upsetting the employee.
learning not to let work-related nagativity affect personal life and family life
mental health concern
mixed messages from leadership, lack of institutional knowledge and selfish outlook from leaders

My job requires me to look a particular way and be in a certain mood, sometimes when I have low energy or am feeling tired I feel a lot of pressure because I feel like I won't be able to perform to the highest standard
Negative elements of the work such as working with difficult people and escalated situations involving violence, theft, harassment, discrimination etc.
NO REWARDS, NO INCENTIVES AND NO SALARAY RASE
No room for growth
No sense of fulfillment. Just a mean to an end.
Outdated practices are prevalent.
Patient relationship
Physical health
Procrastination
Quality of work suffers
Stress is a normal part of work. But what I find challenging is a lot of time spent in meetings then having to find time to do the actual work
Systemic issues result in most of the stress. Management and colleagues are stressed for the same systemic reasons and the stress trickles down or affects me and others. The rising demands of this job makes it near impossible to have a work life balance.
The stress at my previous workplace (title above) (poor management leading to over work, harassment from outside departments, poor compensation) led to me quitting. The workplace was the most toxic I have ever been in.
too many work hours
Too much work and no structure or RACI
Toxic negativity with employees (non-management)
Toxic senior manager. Intimidating and belittling staff and managers in front of peers and subordinates.
Two jobs, one person Lack of communication between management and staff
Very low pay for the nature & quality of work delivered day in - day out
When confronted with tough questions that you cant know the answer or dont know where to get them

When I worked for a company, my workplace stress primarily came from poor compensation for employees and having no clear career growth plan. It makes me feel unvalued as an employee. I also get stressed from micro-managing managers that struggle with trusting their team on managing their work hours and meeting deadlines.
Work place stress and pressure can turn a good working environment into a toxic and soul crushing one
Work time consumed by unnecessary meetings. Time consuming administrative work due to lack on automation or digitalization. Dealing with difficult and unmotivated employees.
Workload would be my biggest stress (relative to time to deliver) - not listed
Workplace behavior of colleagues, Internal Communication,
Workplace stress heightens my anxiety and my ability to cope.
Workplace stress may also be influenced by travel time (to the office, to other work locations for business related purpose) and the related impact on one's social life. Additionally, lack of flexible work arrangements may create stress for employees in the post-Covid workplace - this is especially so if certain employee groups within the organization or across the industry are allowed flex work options.

APPENDIX J – DETAILED TABLES – OPEN ENDED SUGGESTIONS FOR IMPROVEMENT TO VIRTUAL REALITY EXPERIENCES (VERBATIM - UNEDITED)

- Subtitles,
- Interactive component,
- Game,
- Maybe some movement,
- Adding a surround sound headset,
- More interaction,
- Nothing,
- More visuals,
- Nothing,
- N/a,
- Blank,
- Blank,
- guided meditation,
- Breathing exercises,
- Relaxing music,
- Maybe add in time for the participant to practice and repeat after the instructions,
- Any level of interaction to encourage the audience to actually do and practice what is taught.

Declaration of Authorship

The following text is to be attached to the thesis.

"I Ash Patel hereby declare,

- that I have written this thesis independently,
- that I have written the thesis using only the aids specified in the thesis guide;
- that all parts of the thesis produced with the help of aids have been precisely declared;
- that I have mentioned all sources used and cited them correctly according to established aca- demic citation rules;
- that I have acquired all immaterial rights to any materials I may have used, such as images or graphics, or that these materials were created by me;
- that the topic, the thesis or parts of it have not already been the object of any work or examination of another course, unless this has been expressly agreed with the faculty member in advance and is stated as such in the thesis;
- that I am aware of the legal provisions regarding the publication and dissemination of parts or the entire thesis and that I comply with them accordingly;
- that I am aware that my thesis can be electronically checked for plagiarism and for third-party authorship of human or technical origin and that I hereby grant the Swiss School of Business and Management Geneva the copyright according to the Examination Regulations as far as it is necessary for the administrative actions;
- that I am aware that the institution will prosecute a violation of this Declaration of Authorship and that disciplinary as well as criminal consequences may result, which may lead to expulsion from the institution or to the withdrawal of my title."

By submitting this thesis, I confirm through my conclusive action that I am submitting the Declaration of Authorship, that I have read and understood it, and that it is true.

November 9, 2024

_____

Date and student signature