Building resilience among construction professionals in New Zealand: A study of major stressors and stress reduction strategies

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ABSTRACT

Retaining and replacing skilled professionals can be problematic within high-performance construction teams. The onus cascades upon fledgling, inexperienced individuals to embrace these high-stress responsibilities. Previous studies have highlighted the influential role that stress plays as an antecedent to burnout. Emotional fatigue, depersonalisation and a lack of personal achievement all sprout from the burnout syndrome. This project was undertaken as an inductive approach to theory development and employed a cross-sectional survey using a questionnaire. The study population comprised of construction professionals within the New Zealand construction industry. Convenience sampling was used to collect data from 266 New Zealand Site Safe members and their industry partners utilising a survey software called Qualtrics to address the research question. Through the use of a Likert scale, the mean values of the data were used to construct a table that incorporated combined stressors and their stress reduction strategies. "What stresses do construction professionals experience and what recommendations can be concluded to change workplace behaviour to reduce burnout?" The data was then used to construct a table that incorporated combined stressors and their stress reduction strategies. This research identified the contributing stress factors and their respective remedies to make changes in the New Zealand construction environment. The findings noted that various factors within the different clusters were indicative of high workplace stress, the strongest cluster being individual job demands. Other clusters highlighted factors such as managerial behaviour, organisational leadership and the economy as significant contributors. Transparent and clear communications between all staff levels proved to be the strongest moderating factor as a stress reduction remedy. The respondents indicated that a change in their sleeping patterns also created fatigue that leads to burnout. The contribution of this paper and contribution of this research lies in presenting the most significant current stressors in the New Zealand construction industry and aligning them with stress reductions strategies.

KEYWORDS：Construction professionals, Occupational stress, New Zealand, Stress reduction strategies.

INTRODUCTION

Construction is a challenging and ever-evolving modern profession because of; new technologies, ever-increasing project complexity, the industry's cyclical nature, international competition, high client expectations, insufficient soft skills, and a lack of seasoned mentors. These all add up to an increase of daily stressors and often work-life imbalance. Numerous researches have indicated that the construction industry produces some of the most stressful jobs (van Heerden *et al.*, 2018; Walker, 2011).

We all experience stress daily whether our work environment or personal situations cause it. Shahasavarani *et al.* (2015, p.232), classified stress "according to the nature of the stressor (physiological, psychological), its influence on individual (positive eustress, negative distress) and the exposure time of stressor (acute or short-term, chronic or long-term)."

When stress becomes destructive and an individual cannot cope with an overwhelming situation triggered by their immediate environment, it can leave them in a state of mental or physical paralysis. Individuals experience stress differently and their ability to deal with different levels of stress can be referred to as their "resilience" (Mental Health Foundation, 2018). Adjusting to a stressful environment can be achieved by knowing that it can be positive in predictability. Once an individual is able to mentally comprehend that their environment is only stressful at times, rather than life-threatening, they are able to better function within it (Park *et al.,* 2017).

The research presented in this article forms part of a larger research project investigating workplace stress in the New Zealand construction industry. The findings presented from the online survey data identified the most significant stressors and possible causes of stressors and suggests the best possible perceived stress reduction strategies based on feedback from the respondents.

The significance of stress

Stress is a highly intricate area in psychology and is considered to be a significant peril to health (Shahasavarani *et al.*, 2015). Sung-Hoon *et al.*, (2013) have noted that construction managers are heavily work-loaded and experience elevated levels of physical and mental stress. Personal and work-related stressors can result in low productivity, poor job performance and higher absenteeism rates, resulting in financial losses to companies and the construction industry (Bowen *et al.*, 2014; Walker, 2011). Nunes *et al.* (2017) also support this evidence-based research that identified high absenteeism rates relate to stressors such as anxiety, chronic illness, depression, substance abuse, and various other psychological factors that cost the building industry billions of dollars annually. To further breakdown specific stressors that construction professionals endure, a key number of these have a reoccurring common theme, three (3) were identified by the Holmes-Rahe Life Stress Inventory Rating Scale life events. In order from the top, divorces (2), marital separation from a mate (3) and Major personal injuries or illness (6). These are within the top ten life-stressors out of a list of 43.

With regard to statistics on how injuries or illness can effect workplace incidents from a New Zealand perspective, we can look at a survey conducted by the Accident Compensation

Corporation (ACC) and WorkSafe that revealed that the construction industry was responsible for eight (8) fatalities per annum on average between the years of 2015 to 2017. New Zealand Statistics data showed that between 2015 to 2019, the construction industry was responsible on average for around 6.6 work-related fatalities per annum, which reflects a decline, but is still unacceptable. More recent statistics have confirmed that "Around 600 to 900 people die from work-related disease in New Zealand every year. *About 80% of these are men. Approximately 5000 hospitalisations each year are due to work-related ill-health. There are several thousand ACC claims for gradual process injuries, such as noise-induced hearing loss.*" (WorkSafe, 2020, p.1).

Stressors and their outcomes

Kreitner and Kinicki (2001) divided stressors into four major types: individual, group, organisational and extra-organisational, as illustrated in Figure 1.

Task demands are stressors on an individual level that are specific to jobs. As discussed, construction professionals can be exposed to elevated levels of job stress due to their misaligned skill sets or inability to believe in their own abilities to finish a project (Walker, 2011). The interdependencies of these tasks can aggravate this situation. In most cases, the timing of information from various teams is critical and complications can arise if they are not received when required. This can again create pressure situations, where deadlines are not met and working during weekends, or longer hours may be necessary (van Heerden *et al.*, 2018; Walker, 2011).

Another stressor, role ambiguity, can occur when uncertain expectations of duties, level of authority and performance are not defined. This type of stressor can reveal itself when communication is absent via a chain of command set by an organisational structure. For example, a manager may have to report to two or three different parties. This can be highly stressful – especially for urgent matters. Walker (2011) divided the role of conflict into inter-role and intra-role conflicts. Inter-role conflict, for example, is where the construction individual is instructed by their immediate lower manager that a specific job needs to be executed, but there is only a finite (sometimes insufficient) amount of money available. Intra-role conflict would then occur if two managers communicate conflicting instructions with different outcomes to a third party, thus confusing a project direction and creating stress (Walker, 2011).

Non-task-related events can also be classified as organisational stressors, from the induction of new employees through to restructuring and retrenchment of staff. Personalities can be influenced by team leaders when conflict is created. Office dynamics, internal politics, and titles can pressure how professional relationships form within the workplace, and can create factions. There is also the fact that the world in which we live has evolved regarding work-related responsibilities and gender equality. For example, in New Zealand, less than 3% of tradespeople are women and by 2040, the construction sector goal is to elevate this to 30% (BCITO, 2018). What is concerning, is that although the number of females and gender diverse people entering the construction industry increased, it has also instigated; bullying, sexual harassment, and violence (Bowen *et al.*, 2014). This situation needs to change.
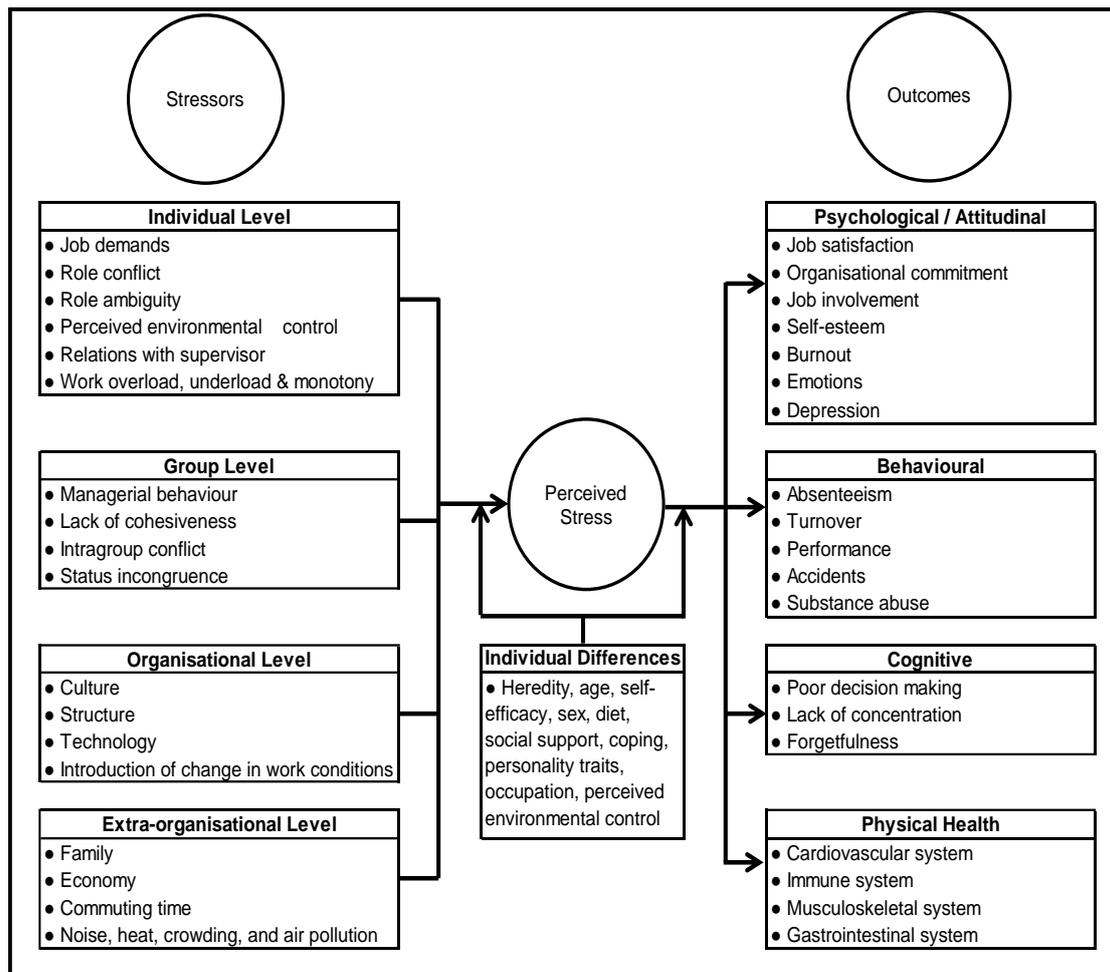
Figure 1: A model of occupational stress (Kreitner & Kinicki, 2001).

Factors outside of a business causing stress can be labelled, extra-organisational stressors. Professionals with lower income and education have been shown to have higher stress levels when compared to their counterparts who have the opposite (Kreitner & Kinicki, 2001; Walker, 2011). These types of stressors include mental and physical stress. Musculoskeletal disorders, depression, injuries, post-traumatic stress disorder (PTSD) and suicidal behaviour are often identified in New Zealand construction individuals (Bowen *et al.*, 2014; MATES in construction New Zealand, 2020). Burnout is one of the final indicators of stress and typically happens over a period of time (Bowen *et al.*, 2014). Walker (2011) confirms that there are no quick-fix solutions regarding burnout. Job characteristics contribute significantly to the reasons behind the condition known as burnout. Walker (2011) notes the importance of a supportive work environment, adding to Coetsee's (2002) research that focused on the idea of a manager's ability to unlock their employee's full potential through the creation of a motivating environment.

However, a motivating environment may be challenging to create, as mental and physical stress can also be triggered by a construction professional abiding with working long hours in addition to what would be considered reasonable to allow for work-life balance. Unfortunately, clients are ever expecting shorter project times within ever-tightening budgets

based on the cost driving a project. To deliver this expectation, projects often end requiring human resources that need to work greater than the programmed or allowed time per week (McKeon, 2011; Walker, 2011). Previous research has linked long working hours and a higher divorce rate. Weekend work and irregular hours have also been shown to increase the probability of divorce among couples with children (Lingard & Francis, 2009). Professionals working in the construction industry are often restricted to the building site and regularly move from one project to the next. This can create stress in their personal lives, as they are not always available for family at home after work, based on the factors that directly influence a project (Kreitner & Kinicki, 2001; Schermerhorn *et al.*, 2005; Walker, 2011). Technology, such as Wi-Fi linked to mobile phones and portable computers, makes it more difficult for modern construction professionals to enjoy holidays or weekends without being distracted by work. Free social time should be used to recharge one's own mental and physical batteries by undertaking fun and physical activities. Walker (2011) has confirmed through his research that exercise provides excellent stress relief. Programmes that have been set up to reduce stress have been noted as not productive and, in many cases, not effective. Stress-management intervention has also been noted as being effective in reducing stress within groups and individuals.

In summary, as a result of a multitude of stressors that can affect construction professionals on a day to day basis, it is not surprising that there is a low retention rate of workers within the building industry (Sung-Hoon *et al.*, 2013; van Heerden *et al.*, 2020). So, for an organisation to support their staff to better handle their perceived stress, they must identify their own shortcomings and present these to their immediate manager. This manager should then acknowledge this request and investigate different methods to unlock their potential, which will reduce problematic stressors. Construction professionals will constantly experience personal growth and further assist themselves in reducing the effect of construction-related stressors on the basis that they are aware of them and take action to manage them accordingly.

RESEARCH METHODOLOGY AND DESIGN

The researchers for this study followed an inductive approach to theory development and employed a cross-sectional survey using a questionnaire. The study population comprised of construction professionals within the New Zealand construction industry. Convenience sampling was used for the availability and willingness of SiteSafe members and their industry partners. The total target population comprised of 1000 members and representative sample size was calculated to be 278, with a +/-5% margin of error, using the table developed by Bartlett, Kotrlik and Higgins (2001). The data was collected from 30 June 2020 to 31 July 2020 using a survey software called Qualtrics.

The methodical choice was a mixed method that captured primary data. By adopting the Likert scale for this research, the mean values of the data were used to construct Table 1 that incorporated combined stressors and their stress reduction strategies. The questionnaire was divided into four main sections. Part A collected general statistical information to categorise respondents in gender, age, the highest level of qualification, number of previously completed projects, sector of involvement, level of soft & technical skills required. Part B is comprised of stressors on an individual, group, organisational, extra-organisational level. The individual-level was subdivided into clusters that including job demands, role conflict, role ambiguity,

interpersonal relationships, ethical dilemmas and work. Part C focused on the perceived effects of the stressors on the respondents' psychological, behavioural and cognitive outcomes. Part D investigated factors that can reduce stress in the event of stressors. This approach was used as the information required to be current and provide contemporary feedback on appropriate and workable solutions that the industry can apply. Informed consent was obtained from all the participants, and the confidentiality and anonymity of the respondents were obtained throughout this research. The Massey University Human Ethics Committee reviewed and approved the research project: Northern, Application NOR 19/47.

DATA ANALYSIS AND FINDINGS

Demographic Profile

From the research data analysis, 79.7% were male and 20.3% were female. This could be interpreted that males still dominate the construction industry, but the number of females entering is steadily increasing. The data collected reflected a widespread of construction professionals' opinions with significant project experience. The average years of construction industry experience was 21 years and approximately 84% were involved in 10 or more projects over this period of time. Approximately 70.7% of the respondents had a qualification of either a; Certificate of achievement (Level 4), Certificate (Level 5), Diploma (Level 6) or a Bachelor's Degree (Level 7). The respondents came from the following four top sectors. Commercial / Retail (25.3%), Residential (20.3%), Industrial (19.4%) and Infrastructure (14.1%).

83.0% of the respondents rated their required technical knowledge to complete a project as being high or very high and their levels of soft skills were self-assessed as being high to very high according to 88.3% of them.

Stressors in the Construction Industry

The following combined stressors and stress reduction strategies presented in Table 1 illustrate responses with a mean value of 3.0 or higher. These numbers, which are shown in brackets, are the responses that were ranked in a Likert scale ranging from 1 (Minimum) to 5 (Maximum).

Individual stressors were divided into a number of categories that included: individual level (3.12), group level (2.91), organisational level (3.24), extra organisational level (3.06). The most significant stressors were noted to be caused on both the organisational and individual levels from the surveyed categories.

The most significant findings from the survey are presented in Table 1 under the headings of different stress levels, their causes and the most suitable stress reduction strategies. The stress reduction remedies, according to the respondents, were paired against the latter stressors. These have been linked to previously published research findings that support the presented outcomes.

On an organisational level, organisational leadership was noted to be the most significant, followed by the organisational environment. This strengthens previous research by Coetsee

(2001) and van Heerden *et al.* (2018) that emphasise the importance of strong leadership and a motivating working environment.

At the Individual level, it was sub-divided into six sections: Job Demands, Role Conflict, Role Ambiguity, Interpersonal Relationships, Ethical Dilemmas and Work. Under Job Demands, pressure to complete projects on time, being asked to do too much, juggling several projects at the same time, high levels of interruptions during the execution of a task & long working hours were the most significant contributors. This supports research undertaken by Sung-Hoon *et al.* (2013) and Lingard and Francis (2009).

In most cases, construction projects commence behind schedule, constantly putting individuals under pressure to try and play catch-up, as Walker (2011) and van Heerden *et al.* (2018) noted. During this time, individuals are mostly involved on more than one project and receiving various variation orders during the construction process which only adds to the challenges. Working constant long hours and being overloaded has traditionally been recognised as part and parcel with the construction industry and can also be linked with an increase of accidents, reduction in quality of work and productivity. Role conflict between consultants and external parties that are key stakeholders was also indicated as a challenge (Walker, 2011). The construction industry is by its very nature fragmented and its clients highly demanding. Consultants can also be guilty of not always informing their clients to the limitations of the triple constraints (quality, cost, time) of their projects. This is often because the client perceives themselves as right and their project team, including consultants, accepts unrealistic demands passed on to the low-profit margin contractor. In addition, it has been confirmed through the survey results presented in this paper that construction individuals are still exposed to situations where there is a possibility to act unethically.

On a Group level, it was shown that managerial behaviour and a lack of cohesiveness had the most significant influence on construction professionals. What was also of interest was that; bust and boom cycles that are typical within the construction industry and the importance of a healthy family situation were noted as key stressors that created the highest influence at the Extra-organisational level (Kreitner & Kinicki, 2001; Schermerhorn *et al.*, 2005).

Stressors Reduction Factors

In addition to the previously mentioned discussion of results, the following list of 30 individual stress reduction factors, as illustrated in Table 1 (that have been noted as being significant during a project), are listed under the perceived stress reduction strategies column.

Transparent and clear communication between staff at all levels was noted to be the most significant. This supports the findings from various other studies conducted. Irfan *et al.* (2019) found that lack of communication between construction parties is at the core of stakeholder conflicts. Therefore, stakeholders should ensure proper and timely communication because poor communication can lead to project failings. The use of advanced and digital collaborative technologies can help in improving the communication culture in the construction industry.

Murray *et al.* (2007) suggest this is a big issue in construction and various reasons for this include lack of clear objectives, faulty transmission, cultural barriers, perception or attitude

and problems. Suggested recommendations to address this include breaking down communication structures and restructuring them to fit a project.

Samanmali (2017) has noted that poor communication and coordination can be caused by a lack of integration among professionals, such as designers and engineers within various construction industry disciplines, resulting in poorly communicated instructions. Early studies by Kerzner (2001), indicated that causes of conflicts in construction projects include: "diversity in expertise of project participant", "project manager's low level of authority", "undefined project goals", "undefined roles among project teams", "undefined project priorities", "fear to losing relevance among project team due to implementation of project management" and "undefined channel of communication".

To improve team communication and collaboration it has been suggested that the "over-the-wall syndrome," a phenomenon that defines a situation where a group that is supposed to work collaboratively are working independently be addressed. This syndrome has been blamed for various problems, including stress among professionals.

Ajayi *et al.* (2016) and Arain *et al.* (2004) suggest more courses on team communication, leadership attributes or teamwork for professionals. Baiden *et al.* (2006) suggests more effective integration of project teams to reduce stress.

A good relationship with supervisors, strong reward and recognition initiatives that compliment remuneration, job security, training and development and increase of family time further were found to be significant stress reduction factors.

Enshassi *et al.* (2015) mentioned that the organisational stressors which include: lack of job stability, inadequate training in safety, low salary, lack of proper evaluation and monitoring of safety performance, unfair rewards and treatment for compliance to safety provisions, the concentration on productivity by employers while ignoring their employees' safety and poor communication, are the major contributors to physical stress, behavioural stress and job burnout. Okuntade (2015) identified inadequate preparation for dealing with more difficult aspects of a job and concern about technical knowledge and skill as one of the main sources stress for construction managers. Another source of stress he cited is job insecurity which can be attributed to the behavioural style of management. It can also result from lack of inadequate and effective communication from upper management. Molen (2000) suggests training as a prevention for stress. This could include technical training and courses on topics such as coping with stress, leadership styles, transactional analysis, time management, personal effectiveness, and conflict management. Okuntade (2019) identified social or physical isolation, lack of support from other staff, conflict among staff, poor relationship with supervisors and managers as main sources of stress for project managers. He suggested self-awareness, self-management, social awareness and relationship management as some coping strategies.

Samanmali (2017) suggests proper communication and providing opportunities to meet superiors on work-related matters and participate in decision making as a strategic approach to mitigate stress. Other factors that were time and work overload related also featured to be important factors. These effects included too much work, pressure, ambitious deadlines and hours worked (Campbell, 2006).

The unhealthy practice of unrealistic timescales and subsequent work pressures need to be recognised. Addressing this will prevent delays and cost overruns in construction projects (Arantes *et al.*, 2015) and reduce the likelihood of stress on professionals working on a project. Shah (2017) mentioned that unethical practice ranks top among the most serious ills affecting the construction industry. Some of the unethical issues faced by the industry includes conflict of interest, inflation of bills, professional incompetence, poor work delivery, fraud, bribery, professional misconduct, intimidation, and kickbacks. Shah (2017) also recommends that promoting awareness regarding the values of ethical behaviour at different forums and ensuring the effective punishment for unethical activities at different stages of project life cycle might reduce the unethical practices within the construction industry.

RESEARCH CONTRIBUTION

The research presented in this paper relied upon gathering current responses from construction professionals on what stresses they experience in the workplace and inviting feedback on what they would recommend, to change workplace behaviour to reduce burnout. The contributing stress factors and their respective remedies were tabled in order of most significant with regard to an above mean average. The timing of this paper also coincided with extraordinary global changes during Covid-19 that have made a significant impact on the growth and continuation of construction projects within New Zealand. From practical experience and in recent consultation with SiteSafe, the authors propose the following solutions to address current health and safety well-being theories and practices in response to previous studies and literature. Future research should focus on the impact of decisions made by the top structure of those working within a project and the overall effect this will have on those delivering on the coal face such as the labouring and finishing trades. These include, sharing of risk that is directly linked to: costings, labour requirements, design complexity and timing for delivery. A company should offer a more flexible reward and recognition system from a stress reduction strategy approach, rather than a standardised one unique to each of those organisations and their employees. Understanding these stressors with regard to most significant, will allow the construction industry and supporting bodies to better understand where these lie, and so be able to focus supporting resources and initiatives for these workers to enable positive work reform and personal behavioural changes within the New Zealand construction environment.

CONCLUSION

The findings of this research report documented in a table format (Refer Table 1) what key stressors are experienced by construction professionals in New Zealand and what stress reduction strategies they perceived as being the most suitable for companies to adopt. These stressors were then divided into different sections titled: extra organisational, organisational, group and individual. Then these stressors were aligned with possible causes and reduction strategies. The causes of the stressors were then labelled and referred back to previous literature to support the findings.

The findings noted that various factors within the different clusters were indicative of high workplace stress, the strongest cluster being individual job demands. Other clusters highlighted factors such as managerial behaviour, organisational leadership and the economy as significant contributors. Transparent and clear communications between all staff levels

proved to be the strongest moderating factor as a stress reduction remedy. The respondents indicated that a change in their sleeping patterns also created fatigue that is known to lead to burnout.

Table 1 offers a unique and up to date contribution to our current body of knowledge within the New Zealand construction industry with regard to a clearly defined list of most felt stressors, their causes and their most suitably identified self-help options to reduce these through prescribed actions to ensure work life balance.

Of these, the most important stress relievers were in order from the top of most important that included: a need to increase time with family, the ability to take leave during projects, more control over workload and decision participation, reduce the required working hours, and increasing the number of available flexible working hours. To answer the research question, respondents, who were categorised as construction professionals, included individuals using mental activity and physical labour for the purposes of this research. This research paper was limited to current SiteSafe members and their industry partners.

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Extra Organisational	Organisational	Group	Individual	Perceived Stress Reduction Strategies
Economy (3.60) Family (3.39)	Organisational leadership (3.58) Organisational environment (3.32) Organisational structure (3.27) Introduction of change in work conditions (3.23)	Managerial behaviour (3.45)	Pressure to complete project(s) on time (4.22) Being asked to do too much (3.91) Juggling several projects at the same time (3.88) High levels of interruptions during the execution of a task (3.86) Overload (3.78) Long working hours (3.66) Asked to do something unethical on a project (3.55) Inflexible work schedules (3.53) Unpredictable working hours (3.29)	Increase of family time (3.83) Ability to take leave between projects (3.59) More control over workload and decision participation (3.56) Reduce the required working hours (3.52) Flexible working hours (3.51) Ability to take leave during projects (3.53)
			Concerns about the task at hand and level of technical skills required (3.45) Preparation or training for the task (3.36); ability to work with new tech (3.02) Lack of support from a mentor (3.07) Condition of work equipment (3.10)	Training & development (3.90) Available resources (3.88) Site mentorship (3.76) Increase in project experience (3.72) Improve soft skills and abilities (3.66) Improve technical skills and abilities (3.58)

Extra Organisational	Organisational	Group	Individual	Perceived Stress Reduction Strategies
			Conflict with consultants (3.36)	Transparent and clear comms between staff at all levels (4.15)
			Conflict with external parties that are key stakeholders (3.34)	
			Conflict with contractors (3.33)	
			Conflict with upper management (3.24), co-workers (3.24) and fellow staff (3.13)	
			Fragmentation of work (3.32)	
			High uncertainty in job process (3.30)	
			Unclear responsibilities (3.19)	
		Managerial behaviour (3.45) Lack of team cohesiveness (3.44) Intragroup conflict (between 2 or more members of the same group / team) (3.22)	Bullying and intimidation (3.03) Verbal abuse at work (3.02) Poor remuneration (3.19) Job status (3.14)	A good relationship with supervisors (3.96) Strong reward and recognition initiatives that complement remuneration (3.95) Job security (3.89) Better work environment (3.65) Increase in salary (3.59) Regular team building (3.59)