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Key Stressors Leading to Construction Professionals' Stress in the Gaza Strip, Palestine

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Abstract: The aim of this paper is to investigate the key stressors that lead to stress among professionals on construction projects. A total of 320 questionnaires were randomly distributed to construction professionals in the Gaza Strip, and 183 were returned, yielding a 51% response rate. Exploratory factor analysis was employed to explore the interrelationships among stressor attributes in four stressor groups (task, personal, physical, and organisational). The results of this study indicated that personality and home-work conflicts are the most prevailing personal stressors linked to stress experienced by Gaza Strip construction professionals. This type of stress was induced because construction professionals did not give attention to their personal lives in addition to their jobs. Task stressors resulted from two types of work overload: quantitative and qualitative. Quantitative overload came from working for long hours with too much work, whereas qualitative overload resulted from a wide range of responsibilities. Physical stressors were not recognised by Gaza Strip construction professionals as an important source of stress. With regard to organisational stressors, it was found that the policies, treatment, and rewards were inadequate. A politicised environment and lack of feedback from the supervisor were responsible for organisational structure stressors. This study will add value to the existing body of knowledge concerning Palestinian professionals' perspectives of stressors in the construction industry. Professionals can take key stressors into consideration to manage and minimise stress on construction projects. Therefore, training sessions on managing and coping with stress is recommended for construction professionals.

Keywords: Stressors, Stress, Construction, Professionals, Factor analysis

INTRODUCTION

The construction sector was identified to be one of the most promising sectors, representing 21% of the national GDP and involving 30% of workers prior to the political crisis (International Labour Organization, 2010). Today, the construction industry employs only 11.4% of the total labour force in Gaza (Palestinian Central Bureau of Statistics, 2014). The local construction industry cannot cope with the reconstruction challenges due to border closures and political instability. The situation is further exacerbated by the expanding gap between labour demand and supply, due to the shortage of appropriate skills to address the reconstruction efforts. Gaza Strip construction professionals (GS-CPs) are required to perform well to maintain their value to the organisations; thus, the stress level of GS-CPs would inevitably be increased. Moreover, the construction industry has long been recognised to be a stressful industry, due to the task complexity, complicated interrelationships among different parties, the poor working environment inherent to construction projects, comprehensive tasks, complicated processes and multiple stakeholders. Each project is unique and involves many unpredictable tasks, a tight and urgent time frame, and complicated workgroup cooperation, which leads to a great deal of stress experienced by construction professionals

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(Leung et al., 2005a; 2005b; Leung, Liu and Wong, 2006; Leung, Sham and Chan, 2007; Leung, Skitmore and Chan, 2007; Leung, Chan and Olomolaiye, 2008; Leung et al., 2008; Leung, Chan and Yu, 2008; Loosemore and Waters, 2004; Haynes and Love, 2004).

According to the Chartered Institute of Building (CIOB, 2006), stress has become a general phenomenon for construction professionals, in which 68% of the construction professionals suffer from stress, anxiety or depression that is directly due to working in the construction industry. In addition, more than half of the construction professionals felt that the construction industry today is comparatively far more stressful than it was five years ago (Wahab, 2010). Construction professionals (CPs) are constantly exposed to varying stressors in their working environment and are likely to experience a high level of job burnout. Burnout threatens the mental and physical health of individuals and, hence, decreases job satisfaction and productivity. CPs are also subjected to occupational demands that can have a negative effect on their psychological well-being, which can have an adverse influence on individual and organisational performance (Yip and Rowlinson, 2006; Leung, Chan and Chen, 2011; Leung, Chan and Yuen, 2010; Love, Edwards and Irani, 2010).

Stress is not always bad, and it is not always necessary to eliminate it (Turkington, 1998). Turkington (1998) stated that a world without any stress would be boring place. Stress can also be the motivation for individuals to optimise their work performance. The goal of stress management should not be to totally eliminate stress, but to learn how to manage and use it effectively (Greenberg, 2002). However, excessive stress is definitely harmful and can lead to burnout. Nevertheless, humans have their own ways to cope with stress, called "coping behaviour" (Lazarus, 1996; Leung, Liu and Wong, 2006). There is a growing body of literature on occupational stress among professionals and workers in the construction industry (CIOB, 2006; Leung, Sham and Chan, 2007; Lingard et al., 2007; Leung et al., 2008; Leung, Chan and Yuen, 2010). This body of contemporary literature has advanced the understanding of the causes of stress and how construction professionals cope with it. A review of the literature showed that there is no research that has examined the stressors among professionals in the construction industry in Palestine and in the Middle East. Therefore, this study aims to investigate key stressors among professionals in the construction industry in the Gaza Strip, Palestine. This study is different from the existing studies as it is conducted in a developing country, Palestine, and it reveals some issues that are specific to the Gaza Strip in addition to the generic issues that are relevant to other countries.

LITERATURE REVIEW

Stress is the attribute that combines the stressor and stress reactivity. Without both of these factors, there is no stress (Greenberg, 2002). Therefore, a stressor is an essential component of stress, and has the potential of eliciting a stress reaction. The term, stressor, was used to designate the stimuli generated on the job that have negative physical or psychological consequences for a significant proportion of the people exposed to them. It is a stressful event or a stressful condition that produces a psychological or physical reaction in the individual that

is usually unpleasant and sometimes causes symptoms of emotional or physical disability. Stressors can generally be divided into four major categories: task, personal, physical, and organisational (Leung et al., 2005a; 2005b; 2008; Leung, Sham and Chan, 2007; Leung, Chan and Chen, 2011; Leung, Chan and Yu, 2008). Haynes and Love (2004) revealed that workload was the highest ranking stressor, followed by working long hours and conflict between family and work. Leung, Chan and Yu (2008) stated that four critical stressors have a significant impact on both the subjective and the objective stresses, including work overload, poor interpersonal relationships, poor work environment, and poor non-work environment. Leung et al. (2005b) surveyed the main causes of the stress endured by construction cost estimators in Hong Kong, which are work overload, role conflict, job ambiguity, and the working environment.

Leung et al. (2008) also investigated the causal relationships between the stressors and stress of clients' and contractors' cost engineers in Hong Kong. They found that social support is the only stressor that negatively influences the stress of both the clients' and the contractors' cost engineers. In a recent study, Leung, Chan and Yu (2012) used standardised focus groups to explore and identify the various types of stressors that cause stress experienced by Hong Kong expatriate construction professionals. Their results were divided into four main categories: interpersonal stressors (personal traits, work traits of the locals, lack of language fluency, poor workgroup relationships and home-work conflict), task stressors (qualitative and quantitative work overload, role ambiguity, and role conflict), organisation stressors (formalisation, centralisation, complexity, and organisational supports) and physical stressors (living standards, crowded transportation and the pay differentials). Ng, Skitmore and Leung (2005) found that the most difficult stressors to manage were bureaucracy, a lack of opportunity to learn new skills, work-family conflicts and a different view from their superiors. Ibem et al. (2011) reported that the principal sources of stress were a high volume of work, uncomfortable office sites, lack of feedback, and variations in the scope of work.

Personal stressors, which are related to an individual's personal and/or interpersonal factors, are the antecedents of stress among CPs (Leung, Sham and Chan, 2007; Leung, Chan and Olomolaiye, 2008). It refers to the type of individuals' behaviour, to interpersonal relationships and to home-work conflict (Leung and Chan, 2010). Stressors induce different reactions for different people due to their different personality. Some people are unable to cope with stress-provoking situations, whereas others cope with stressors better than others: they adapt their behaviour in a way that meets the environmental challenges (Leung and Chan, 2011). According to Schafer (2000) and Friedman and Rosenman (cited in Leung and Chan, 2011), there are five types of behaviour patterns. The two most common types of type A and type B behaviours. Individuals with type A behaviours are considered to be more impulsive, competitive, aggressive or hasty. They live by timetables and deadlines, are impatient, insecure of their status, generally hostile and incapable of relaxing, which is opposite for those with type B behaviours, who are more easy-going and placid. According to the previous studies, type A people report more stress and stress-related illness than type B people (Leung, Skitmore and Chan, 2007; 2008; Sogaard et al., 2007; Leung and Chan, 2011).

Task stressors refer to sources of stress that are intrinsic to the nature of one's job. Stress can be caused by too much or too little work, time pressure and

deadlines, having too many decisions to make (Ibem et al., 2011), fatigue from the physical strains of the work environment, long working hours, having to cope with changes at work and the expenses (monetary and career) of making mistakes (Ng, Skitmore and Leung, 2005; Wahab, 2010). Task stressors usually refer to work load and role stressors in the daily work (Leung, Chan and Yu, 2008; Leung and Chan, 2010). Work overload occurs when there are discrepancies between the job demands and an individual's ability to cope (Leung et al., 2005b; Leung, Chan and Yu, 2008). In fact, work overload is common among construction professionals (CIOB, 2006; Djebarni, 1996; Leung et al., 2005b; Leung, Chan and Yu, 2008). It is agreed that overload is significantly related to a number of symptoms and indicators of stress: escapism, absenteeism from work, low motivation to work, lower self-esteem and an absence of suggestions to employers (Ibem et al., 2011).

The physical work condition refers to a poor work or home environment for the CPs. This may include excessive noise, extremely high or low room temperatures, inappropriate lighting, a lack of privacy, ventilation, the hygiene of the workplace, the physical setting of the workplace, and others (Ibem et al., 2011; Ng, Skitmore and Leung, 2005; Haq, Iqbal and Rahman, 2008; Leung et al., 2005a). Poor working conditions promote stress and affect the working performance of an individual. In the early studies of work stress, many psychologists focused on physical stressors and their effects on the experience of stress and subsequent strain. Unsafe physical conditions can be a potential source of work stress, particularly when individuals must confront the threat of injury (Wahab, 2010). Dangerous tasks, toxic chemicals, high noise levels, dust, overcooling, unpleasant odours and other stressful factors can lead to illness or disease (Greenberg, 2002).

Organisational stressors refer to the sources of stress coming from and within an organisation itself, including the organisational structure and the degree of autonomy given to employees (Andrews et al., 2009; Leung, Chan and Yu, 2008; Leung and Chan, 2010). It is believed that the size and structure of a company has a strong relationship with the level of stress suffered by individuals (Ibem et al, 2011; Ng, Skitmore and Leung, 2005; Haq, Iqbal and Rahman, 2008). According to Gmelch (cited in Leung and Chan, 2010), poor organisational structure includes the presence of bureaucracy and hierarchies within construction organisations. In addition, the level of complexity of the rules and bureaucracy of an organisation can induce conflict within the organisation. Both bureaucracies and the lack of power associated with an individual aggravate stress. It was also found that individuals who work in more politicised environments engage in more neglectful behaviour, reduced task levels, and exhibit a poorer work attitude, lower job satisfaction and commitment, and greater intention to leave, among others (Vigoda, 2000).

METHODOLOGY

This study designed and conducted a quantitative survey as an appropriate method for data collection. This method has been widely adopted by previous studies (Enshassi et al., 2007; Enshassi, Mohamed and Abushaban, 2009). The questionnaires were randomly distributed by hand to construction professionals (target respondents). The construction professionals in this study are referred to as

project managers, supervisors, structural engineers, and architects who have more than 10 years' experience in the construction industry.

Population and Sample Size

The study was performed in the Gaza Strip, which consists of five governorates: the northern governorate, the Gaza governorate, the middle governorate, the Khan Younis governorate and the Rafah governorate. The populations of this study included the contracting companies that are registered in the Palestinian Contractors Union (PCU) in the Gaza Strip and classified by the National Classification Committee as having a valid registration in the PCU. According to the PCU in the Gaza Strip, 216 construction companies were registered and graded according to the field of work. The National Classification Committee classified the companies based on the company capital and the number of performed projects. Each company had several classifications with different disciplines (i.e., buildings, roads, maintenance, etc.). The overall classification was based on the highest rank obtained. Table 1 shows the detailed classification of contracting companies.

Table 1. Classification of the Contractors in Gaza Strip

Governorate Classification	Number of Contracting Companies					
	Gaza	Middle	Khan Younes	Rafah	North	Total
First A	18	–	3	2	2	25
First B	20	1	4	8	4	37
Second	28	3	16	7	8	72
Third	14	5	8	7	4	38
Total	90	9	31	24	18	172
Respondents	40	9	15	5	18	87
Fourth/Fifth						44

Source: Palestinian Contractors Union in the Gaza Strip (pers. comm., 2013)

In this paper, the target population was the contracting companies that were classified under the first, second and third grades. A total of contracting 172 companies were classified as first, second and third grade, which was the target population group of this research. The fourth and fifth grades were neglected due to the law, and practical and administrative experience.

The following statistical equation was used to determine the sample size (Naoum, 2007).

$$SS = \frac{Z^2 \times P \times (1-P)}{C^2}$$

where
SS = The sample size
Z = Z value (e.g., 1.96 for 95% confidence interval)

P = The percentage of picking a choice, expressed as decimal (0.50 used for sample size needed)
C = Maximum error of estimation (0.08)

$$SS = \frac{1.96^2 \times 0.5 \times (1-0.5)}{(0.08)^2} = 150$$

The correction for the finite population is described as

$$SS_{new} = \frac{SS}{1 + \frac{SS-1}{pop}}$$

where *pop* is the population, which was 172 contracting companies, according to PCU, in our study.

So that: $$SS_{new} = \frac{150}{1 + \frac{150-1}{172}} = 80.4 \approx 81$$

The previous calculations showed that the minimum number of questionnaires that needed to be collected was 81, representing 47.1% of the population. Three hundred and twenty questionnaires were randomly distributed (two to three copies for each contracting company) to construction professionals with different professions. A total of 320 questionnaires were distributed to the targeted respondents and 183 questionnaires were returned, yielding a 51% return rate.

Questionnaire Design

The questionnaire was initially developed from a thorough literature review (Ibem et al., 2011; Leung and Chan, 2010; Leung, Wong and Oloke, 2003; Leung et al., 2005a; 2005b; 2008; 2011; Leung, Liu and Wong, 2006; Leung, Sham and Chan, 2007; Leung, Skitmore and Chan, 2007; Leung, Zhang and Skitmore, 2008; Leung, Chan and Olomolaiye, 2008; Leung, Chan and Yu, 2008; Leung, Chan and Yuen, 2010; Haynes and Love, 2004; Lingard, 2003; Lingard and Francis, 2004; Ibem et al., 2011; Loosemore and Waters, 2004; Aitken and Crawford, 2007; Bowen, Edwards and Lingard, 2013; Leung and Chan, 2011; Leung, Chan and Yu, 2012; Yip and Rowlinson, 2006; Djebarni, 1996; Ng, Skitmore and Leung, 2005). A pilot study was conducted with 15 construction professionals who have more than 10 years' experience in construction projects. The aim of the pilot study is to ensure that the questionnaire was phrased correctly, to ensure no difficulty in answering the questions, to ensure the appropriateness of the identified key stressors, and provide appropriate measures for the study design. The 10 construction professionals were asked to comment on the readability, comprehensiveness, and accuracy of the questionnaire. The pilot study results revealed that some attributes were repeated, irrelevant, weak or vague and should be omitted. Other attributes were modified to suit the Gaza Strip construction professionals' work nature, and

some attributes were added. The questionnaire was modified based on the results of the pilot study. After the pilot study, the structured questionnaires were administered to the target respondents to elicit their perceived agreement with the key stressors adopted for this study. The respondents were invited to indicate the level to which they agreed with each stressor using a five point Likert rating scale (Strongly agree = 5, Agree = 4, Neutral = 3, Disagree = 2 and Strongly disagree = 1). This scale enabled the respondents to provide a magnitude to their response for each question, thus enhancing our ability to analyse and produce a meaningful outcome.

Factor Analysis

Factor analysis is a data reduction statistical technique that is used to reduce a set of variables to a smaller number of variables or factors (Zhang, 2005; Fellows and Liu, 2008). To evaluate the adequacy of the survey data to the factor analysis, the Kaiser-Meyer-Olkin (KMO) test (Kaiser, 1960) and Bartlett's test of sphericity were conducted to test the strength of the relationships among the variables (Bartlett, 1954). The KMO test and Bartletts' test of sphericity assess the sampling adequacy and multivariate normality. Bartletts' test of sphericity determines whether the correlation matrix is an identity matrix. The KMO value represents the ratio of the squared correlation between the variables to the squared partial correlation between the variables, which varies from 0 to 1. A value close to 1 indicates that the pattern of correlation was relatively compact, and, hence, the factor analysis should give distinct and reliable results. A minimum value of 0.5 has been suggested (Kaiser, 1974; Hair et al., 1998; Field, 2005). Values of higher than 0.5 were recommended by Kaiser (1960; 1974) (cited in Chan, 2008). There are two types of factor analysis methods: exploratory factor analysis and confirmatory factor analysis. Exploratory factor analysis was often used in the early stages of research to explore the inter-relationships among a set of variables, whereas a confirmatory technique was used in the latter part of the research to confirm the specific hypotheses or theories concerning the structure of a set of variables. The exploratory factor analysis method was adopted in this study.

Validity and Reliability of the Questionnaire

The statistical validity of the questionnaire is the degree to which an instrument measures what it is designed to measure (Polit and Hungler, 1985). The criterion-related validity and structure validity of the questionnaire were conducted. The *p*-values (Sig.) were less than 0.05; thus, the correlation coefficients for all of the fields were significant at 0.05. Therefore, it can be said that the fields were valid to measure the main aim of the study. Cronbach's Alpha was calculated to test the internal consistency reliability of the generated scale. The alpha reliability coefficient value ranges between 0 and 1 (Hair et al., 1998; Pallant, 2001; Fellows and Liu, 2008). The closer alpha is to 1, the greater the internal consistency reliability of the items in the scale. The Cronbach's Alpha coefficient was calculated for each field of the questionnaire. Cronbach's Alpha is 0.855 for the entire questionnaire, indicating that the reliability coefficients are acceptable and the internal consistency of the statements included in the scale is excellent (refer to Table 2). Therefore, it can be said that the questionnaire was valid and reliable.

Table 2. Cronbach's Alpha for Each Field of the Questionnaire

No.	Field	Cronbach's Alpha
1.	Personality-home-work vonflict	0.893
2.	Relationship with others at work	0.636
3.	Distrust	0.823
	Personal Stressors	0.658
4.	Work overload	0.920
5.	Role stressors (conflict/ambiguity)	0.858
6.	Work under-load	0.812
	Task Stressors	0.885
7.	Poor home/working environment	0.877
8.	Dangerous environment	0.506
	Physical Stressors	0.850
9.	Organisational policies, treatment and reward	0.663
10.	Autonomy	0.888
11.	Organisational structure	0.480
	Organisation Stressors	0.592
	Stressors	0.859

RESULTS AND DISCUSSION

In this section, the results are presented for each type of the four stressors (personal, task, physical, organisational) suffered by construction professionals in the Gaza Strip. The most important key stressors that lead to stress experienced by construction professionals in each group will be identified and discussed.

Factor Analysis Results for the Personal Stressors

In this study, principle factor extraction analysis with Varimax rotation was performed using SPSS version 20. To assess the suitability of the data for factor analysis, the KMO measure of sampling adequacy and Bartlett's test of Sphericity were conducted. Cronbach's Alpha was calculated for reliability. The analysis results (Table 3) showed that the KMO measure for sampling adequacy was 0.680, which is larger than 0.5, suggesting that the sample was acceptable for factor analysis. The Bartlett's test was 759.634 and the associated significance level was *p*-value < 0.001, indicating that the population correlation matrix was not an identity matrix. Both of the tests showed that the obtained data supported the use of factor analysis. Cronbach's Alpha of 0.658 suggested that the reliability of the research instrument used was also acceptable.

Table 3. KMO and Bartlett's Test of Personal Stressors

KMO Measure of Sampling Adequacy		**0.680**
Bartlett's test of Sphericity	Approx. chi-square	759.634
	Degree of freedom (df)	120
	p-value	< 0.001
Cronbach's Alpha		0.658

Table 4 lists the eigenvalues associated with each linear attribute before extraction, after extraction and after rotation.

Table 4. Attribute Transformation Matrix of the Personal Stressors

Attribute	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	3.478	21.736	21.736	3.478	21.736	21.736	3.095	19.345	19.0
2	2.355	14.719	36.454	2.355	14.719	36.454	2.215	13.844	33.2
3	1.646	10.290	46.745	1.646	10.290	46.745	2.169	13.556	46.7
4	1.430	8.935	55.680						
5	1.061	6.631	62.311						
6	0.973	6.084	68.396						
7	0.816	5.101	73.497						
8	0.755	4.718	78.216						
9	0.657	4.108	82.324						
10	0.545	3.407	85.730						
11	0.486	3.040	88.770						
12	0.460	2.877	91.648						
13	0.397	2.481	94.128						
14	0.357	2.230	96.359						
15	0.320	1.999	98.358						
16	0.263	1.642	100.000						

Figure 1 presents the scree plot, which resulted in three factors, because the regression line was divided into three attributes and then became a nearly straight line. After extraction, Factor 1 (personality-home-work conflict) explains 19.345% of the total variance. The second and third factors, relationship with others

at work and distrust, explain 13.844% and 13.556% of the total variance, respectively (Table 4).

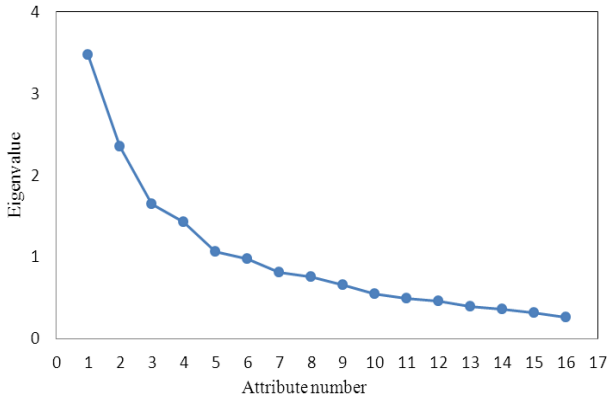

Figure 1. Scree Plot for Personal Stressor Attributes

Using exploratory factor analysis, the factor analysis extracted three factors with eigenvalues greater than 1.0, which explained 46.745% of the total variance. The three-factor solution with the respective loading scores is shown in Table 5. The factor loading of 0.50 was considered to be the cut-off point.

Table 5. Factor Loadings for Personal Stressors after Varimax Rotation

Description of the Factors and Attributes	**Factor Loading**	**Variance Explained**
Factor 1: Personality–home–work conflict		
I often feel that nothing matters in life besides my job	0.782	19.0%
My devotion to work is usually in conflict with my devotion to my family	0.736	
It is hard for me to focus on one activity for a long time	0.710	
People sometimes say that I easily lose my temper	0.705	
Family problems often concern me (e.g., trouble with children and marriage)	0.653	
Factor 2: Relationship with others at work		
My colleagues and I do not cooperate with team spirit	0.647	13.8%
I do not have a good relationship with my superiors	0.619	
I am an achievement-oriented person	0.606	
I enjoy competition and feel I always have to win	0.573	
My subordinates are friendly	0.572	

(*continue on next page*)

Table 5: (*continued*)

Description of the Factors and Attributes	Factor Loading	Variance Explained
Factor 3: Distrust		
I do not have social contact with people at work	0.708	13.6%
I am not sure that I have properly divided my time between tasks	0.706	
I always end up disagreeing with customers, co-workers, supervisor, or management	0.678	
There often seems to be a lack of trust between me and my colleagues	0.673	

Factor 1: Personality–home–work conflict

The first factor (personality-home-work conflict), which has the largest total variance of 19.0%, can explain most of the important attributes of personal stressors for construction professionals. This factor contains five attributes related to an individual's personality and the conflict between the work and home environment. The majority of the attributes have relatively high factor loadings (≥ 0.653). As illustrated in Table 5, the highest factor loading attribute of the first factor was "I often feel that nothing matters in life besides my job". This means that construction professionals preferred their job to their home life, and this caused stress to them. This reflected the importance of work in Gaza Strip construction professionals' point of view, which may be related to the economic situation. This result is in accord with the outcomes from Leung and Chan's (2010) study, which also had this attribute in the first rank and agreed with Leung et al. (2005b), but it was ranked 3rd in the study. Ng, Skitmore and Leung (2005) also found that this attribute is among the most influencing attributes that causes stress to professionals. The second highest factor loading attribute is "My devotion to work is usually in conflict with my devotion to my family". This was an extension of the first attribute because the negligence towards the family because of work could induce conflict and, hence, form an important source of stress. The social life in the Gaza Strip requires more contribution from individuals towards their families. This outcome agreed with the findings of Leung et al. (2005b; 2008), Leung, Sham and Chan (2007) and Lingard and Francis (2004), with the same rank and with Leung and Chan (2010), but with the first rank.

Factor 2: Relationship with others at work

The second factor is labelled (relationship with others at work), which is the second largest variance of 13.8% and comprises five attributes. The first attribute with the highest factor loading is "My colleagues and I do not cooperate with team spirit". This indicated that poor team spirit increased the stress among colleagues. This may related to the culture of the Palestinian people, who do not encourage cooperation between individuals. This agreed with Leung and Chan (2011), who indicated poor team cooperation as one of the most highly ranked attributes that cause stress. The second most important attribute "I do not have a good relationship with my superiors" reflected the same aspect. Leung and Chan (2010)

ranked this attribute first in its group, and Leung and Chan (2011) emphasised that stress arises from complicated workgroup relationships.

Factor 3: Distrust

The third factor is related to distrust, which explains 13.6% of the total variance and contains four attributes. The majority of the attributes had relatively high factor loadings (≥ 0.673). As shown in Table 5, the most important attribute with the highest factor loading is "I do not have social contact with people at work", which reflected the separation between private life and work. This may be related to the time factor and culture of the individuals, which reduces the social relationship between families. This was in contrast to Leung et al. (2005b), which marginalised this attribute. The second most important attribute of this factor is "I am not sure I have properly divided my time between tasks". The respondents suffered from an inability to effectively divide their time between tasks. This may reflect personal inefficiency, a lack of experience, or huge job responsibilities. This outcome agreed with Leung et al. (2005b) and Leung, Zhang and Skitmore (2008), who classified this attribute as the most important attribute affecting the distrust factor. However, this disagreed with Leung, Sham and Chan (2007), who eliminated this attribute because of its low loading factor.

Factor Analysis Results of Task Stressors

Task stressor contains three factors with related attributes. The analysis of each factor (i.e., work overload, role stressors, and work under-load) is designed to determine the extent to which task stressors contribute to the stresses suffered by construction professionals in the Gaza Strip. The analysis shows that the KMO measure for sampling adequacy was 0.778 (more than 0.50), indicating that the data were appropriate for this analysis (Kaiser, 1974). Bartlett's test of Sphericity was 1327.692, which is significant (*p*-value < 0.001), indicating that the factor analysis is appropriate. Using Cronbach's Alpha, the overall internal reliability of the task stressors was 0.885. This suggests that the question consistently measures what it is designed to measure.

Table 6. KMO and Bartlett's Test of Task Stressors

KMO Measure of Sampling Adequacy		**0.778**
Bartlett's test of Sphericity	Approx. chi-Square	1327.692
	df	190
	p-value	< 0.001
Cronbach's Alpha		0.885

Table 7 lists the eigenvalues associated with each linear attribute before extraction, after extraction and after rotation.

Table 7. Attribute Transformation Matrix of Task Stressors

Attribute	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.574	22.871	22.871	4.574	22.871	22.871	4.144	20.719	20.7
2	2.990	14.951	37.822	2.990	14.951	37.822	3.059	15.297	36.0
3	2.224	11.118	48.940	2.224	11.118	48.940	2.585	12.925	48.9
4	1.262	6.312	55.252						
5	1.186	5.928	61.180						
6	1.002	5.010	66.191						
7	0.882	4.408	70.598						
8	0.759	3.797	74.395						
9	0.697	3.484	77.879						
10	0.658	3.290	81.168						
11	0.581	2.903	84.072						
12	0.527	2.635	86.707						
13	0.485	2.424	89.131						
14	0.451	2.253	91.384						
15	0.398	1.988	93.372						
16	0.353	1.766	95.138						
17	0.296	1.479	96.617						
18	0.261	1.307	97.923						
19	0.227	1.133	99.056						
20	0.189	0.944	100.000						

Figure 2 shows the scree plot, which resulted in three factors, work overload, role stressors (conflict/ambiguity), and work under-load, because the regression line was divided into three attributes and then become a nearly straight line. After extraction, Factor 1 (work overload) explains 20.719% of the total variance. Factor 2 (role stressors) explains 15.297% of the total variance and Factor 3 (work under-load) explains 12.925% of the total variance (Table 7).

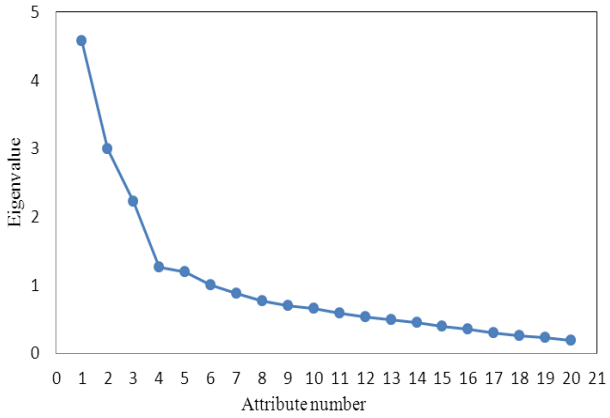

Figure 2. Scree Plot for Task Stressor Attributes

Using exploratory factor analysis, the factor analysis extracted three factors with eigenvalues greater than 1.0, which explained 48.940% of the total variance. The three-factor solution with the respective loading scores is shown in Table 8. The factor loading of 0.50 was considered to be the cut-off point. The reliability scores (Cronbach's Alpha) for the factors range from 0.812 to 0.920 and indicated adequate internal consistency.

Table 8. Factor Loadings of the Task Stressor Attributes After Varimax Rotation

Description of Factors and Attributes	**Factor Loading**	**Variance Explained**
Factor 1: Work overload		
I have many responsibilities in my job	0.750	20.7%
I work for long hours	0.738	
I am often required to work on multiple tasks at the same time	0.710	
I have to put much effort into guiding my subordinates in their tasks	0.695	
There is constant pressure to work every minute, with little opportunity to relax	0.676	
The tasks I have to work on are often urgent and have tight deadlines	0.662	
I often meet with team members and do not have enough time to myself	0.615	
The project problems I have to handle are often complicated	0.576	
I frequently work overtime (evenings and weekends) to finish my work	0.536	
Factor 2: Role stressors (conflict/ambiguity)		
My job responsibilities are generally vague, unclear and inconsistent	0.856	15.3%

(*continue on next page*)

Table 8: (*continued*)

Description of Factors and Attributes	**Factor Loading**	**Variance Explained**
Explanations of what has to be done are often unclear	0.837	
The organisation goals and objectives are intangible and not clearly spelled out	0.823	
I often have difficulty deciding between high productivity and high quality	0.506	
Factor 3: Work under-load		
I feel my skills and abilities are not being used well	0.761	12.9%
I am given very limited authority	0.751	
I frequently find my job boring and repetitive	0.705	
I am often caught by conflicting demands between different parties	0.521	

Factor 1: Work overload

The first factor (work overload), which has the largest total variance of 20.7% of the total variance, can explain the most important attributes of task stressors and the nine attributes. As shown in Table 8, the first attribute with the highest factor loading is "I have many responsibilities in my job". This attribute refers to quantitative and qualitative overload. Too much work to do with wide range of responsibilities promoted stress experienced by the construction professionals in the Gaza Strip due to the task requirements. This finding is in accord with the results reported by Leung et al. (2005b), whose respondents had a wide range of responsibilities in their work. The studies of Leung, Sham and Chan (2007) and Leung, Chan and Yu (2008) showed similar results, but this attribute had less importance in loading. In contrast to those findings, the respondents of Leung and Chan (2010) had very little responsibility. The second highest attribute is "I work for long hours", which is considered an indicator of quantitative overload. The frequent border closures and shortage of materials have caused delays in most construction projects. Hence, overtime work was required to overcome this problem. This increased the load upon the construction professionals in particularly unstable political situations. This outcome agreed with Leung and Chan (2010), whose respondents spent evenings and weekends finishing their work. The respondents in Leung et al. (2005b), Leung, Sham and Chan (2007), Leung, Chan and Yu (2008), Lingard and Francis (2004) and Ng, Skitmore and Leung (2005) had overtime and constant pressure as the most highly ranked attributes under this factor.

Factor 2: Role stressors (conflict/ambiguity)

The second factor, (role stressors [conflict/ambiguity]), explains 15.3% of the total variance and contained five attributes. The first attribute with the highest factor loading is "My job responsibilities are generally vague, unclear and inconsistent", which reflects role ambiguity. It meant that the job title did not reflect the

responsibility assigned to the individuals. This imposed more work and more accountability in the case of failure, but no rewards were obtained for successes. Therefore, this attribute can increase the stress of construction professionals. This factor was ranked similarly by the respondents in Leung and Chan (2010). They reported that role ambiguity had significant effect on their respondents. Leung et al. (2005b) also found that job specificity, including unclear and inconsistent responsibilities, contributed to the role ambiguity stressor. Leung, Chan and Yu (2008) and Leung, Skitmore and Chan (2007) reported that poor role congruence came from unclear and inconsistent responsibilities. The second highest attribute "Explanations of what has to be done are often unclear" is an indicator of role ambiguity. Job specifications should be clear and consistent to help the employees complete their work duties. The study proved that construction professionals experienced unclear directions and explanations from their supervisors. A lack of training sessions provided by the organisation may be responsible for this problem. Furthermore, turnover and non-permanent staff due to the fluctuating construction industry in the Gaza Strip may affect the ability of the organisation to train new employees as required. The study of Leung and Chan (2010) and Leung et al. (2008) supported this attribute as a source of stress.

Factor 3: Work under-load

The third factor, work under-load, explains 12.9% of the total variance and contains four attributes. The most important attribute in this factor is "I feel my skills and abilities are not being used well". This attribute can be traced to overqualified employees that need to work regardless of the job title. The economic situation in the Gaza strip played a significant role in forcing some individuals to work in positions that did not match their qualifications. Leung et al. (2005b; 2008) and Leung, Sham and Chan (2007) reported the same attribute as the second most highly ranked source of work under-load. The second attribute under this factor is "I am given very limited authority". This attribute was modified by the pilot study from limited responsibility to limited authority. It reflected that construction professionals in the Gaza Strip had many responsibilities with limited authority. This increased their stress because they were not allowed to make decisions without referring to upper management. The respondents in Leung, Zhang and Skitmore (2008) and Leung, Skitmore and Chan (2007) suffered from insufficient authority to properly do their job. They did not have an opportunity to participate in decisions that affect their job. In contrast, Leung, Chan and Yuen (2010) found this attribute to be less important. In their research, this attribute was ranked last because of low loading factor.

Factor Analysis Results of Physical Stressors

The results of the factor analysis consisted of a two-factor solution (poor home/working environment and dangerous environment). First, the data suitability was assessed using a measure of sampling adequacy. Table 9 shows the KMO and Bartlett's test of Sphericity. For these data, KMO = 0.782, which falls into the region of acceptance (more than 0.5). Therefore, the factor analysis is appropriate for these data. Bartlett's test is significant (p-value < 0.001), and, therefore, factor analysis is appropriate. Using Cronbach's Alpha, the overall internal reliability of the

physical stressors was 0.850. This suggests that the question consistently measures what it is designed to measure.

Table 9. KMO and Bartlett's Test of Physical Stressors

KMO Measure of Sampling Adequacy		**0.782**
Bartlett's Test of Sphericity	Approx. Chi-Square	329.875
	df	28
	p-value	< 0.001
Cronbach's Alpha		0.850

Table 10 lists the eigenvalues associated with each linear attribute before extraction, after extraction and after rotation.

Table 10. Attribute Transformation Matrix of Physical Stressors

Attribute	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	3.022	37.770	37.770	3.022	37.770	37.770	2.798	34.980	34.98
2	1.139	14.236	52.006	1.139	14.236	52.006	1.362	17.026	52.00
3	0.967	12.091	64.097						
4	0.840	10.497	74.594						
5	0.712	8.906	83.500						
6	0.541	6.757	90.257						
7	0.464	5.802	96.059						
8	0.315	3.941	100.000						

Figure 3 shows the scree plot, which resulted in two factors, poor home/working environment and dangerous environment, because the regression line was divided into two attributes and then became a nearly straight line. After extraction, Factor 1 (poor home/working environment and dangerous environment) explains 37.770% of the total variance and Factor 2 (dangerous environment) explains 14.236% of the total variance (Table 10).

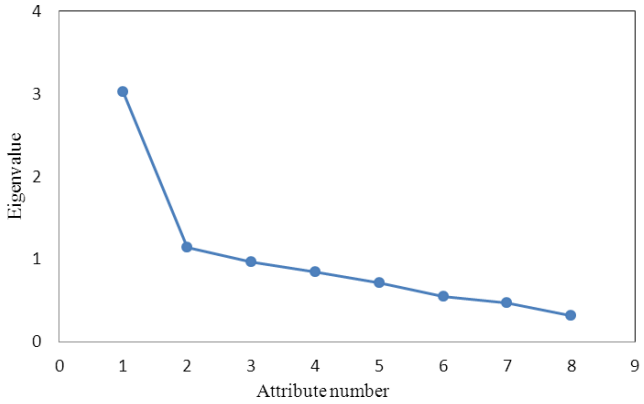

Figure 3. Scree Plot for the Physical Stressor Attributes

The two-factor solution explains 52.006% of the total variance. The two-factor solution with respective loading scores is presented in Table 11. The reliability scores (Cronbach's Alpha) for the factors range from 0.506 to 0.737 and indicated adequate internal consistency.

Table 11. Factor Loadings of Physical Stressors Attributes After Varimax Rotation

Description of Factors and Attributes	**Factor Loading**	**Variance Explained**
Factor 1: Poor home/working environment		
The lighting in my office/workplace is not suitable.	0.764	37.8%
My office/workplace is abnormally noisy and crowded.	0.755	
There is a lack of technology used in my work.	0.746	
It sometimes gets too hot or cold in my office/workplace.	0.678	
My home environment is not comfortable.	0.558	
There is an adequate work service.	–0.456	
Factor 2: Dangerous environment		
My job is dangerous.	0.802	14.2%
Home is far from my work and there is often traffic congestion.	0.532	

Factor 1: Poor home/working environment

The first factor, poor home/working environment, explains 37.8% of the total variance and contains six attributes. Table 11 shows that the "The lighting in office/workplace is not suitable" attribute has the highest factor loading. This can be traced to the electricity problems in the Gaza Strip. This problem was responsible for stopping work for several hours during the day. The lighting problem was one of the most important consequences of shutting off the electricity. Power generators were used everywhere, but several problems were encountered with

their use. This result is in accord with Leung, Skitmore and Chan (2007) and Leung, Zhang and Skitmore (2008) who concluded that the dim lighting in an office was the main source of physical stressors. This problem may be caused by different problems, such as technical and maintenance problems as well as electricity problems. Leung, Chan and Yuen (2010) concluded that insufficient lighting provided unsafe environment. The second important attribute is "My office/workplace is abnormally noisy and crowded". The small, crowded area and the nature of the Gaza Strip created a normally noisy and stressful environment. The surrounding environment affected the performance of construction professionals in both the office and sites. Power generators, traffic jams, and the large noisy equipment used in construction were responsible for the noisy environment. Many studies support that this attribute was a main source of physical stressors. Leung and Chan (2010), Leung et al. (2005b; 2008), Leung, Sham and Chan (2007) and Leung, Chan and Yu (2008) indicated that a noisy and crowded work place imposed stress on construction professionals in China.

Factor 2: Dangerous environment

The second factor, dangerous environment, explains 14.2% of the total variance and comprises two attributes. The first attribute in this factor is "My job is dangerous". Insufficient safety equipment, irregular equipment checks and maintenance, unorganised equipment, and insufficient lighting may considered to be the main hazards in construction work. This result is in accord with the results of the studies from Ng, Skitmore and Leung (2005) and Leung, Chan and Yuen (2010). The second attribute is "Home is far from my work and there is often traffic congestion". This attribute indicated that traffic jams and long travel times accounted for dangerous accidents. The unsuitable, old, and demolished roads increased the chance for such accidents. This outcome is consistent with Leung and Chan (2011), who found that crowded transportation constitutes an important stressor.

Factor Analysis Results of Organisational Stressors

The organisation stressor contains three factors that resulted from the factor analysis (i.e., organisational policies treatment and reward, autonomy, and organisational structure). First, the data suitability was assessed using a measure of sampling adequacy. Table 12 shows the KMO and Bartlett's Test of Sphericity. For these data, KMO = 0.715, which falls into the region of acceptance (more than 0.5); therefore, the factor analysis was appropriate for these data. Bartlett's test is highly significant (p-value < 0.001), and, therefore, the factor analysis was appropriate. Using Cronbach's Alpha, the overall internal reliability of the organisational stressors was 0.592 (0.60). Alpha values of 0.60 or higher are considered acceptable (Malhotra, 1999). This suggests that the question consistently measures what it is designed to measure.

Table 12. KMO and Bartlett's Test of Organisational Stressors

KMO Measure of Sampling Adequacy		**0.715**
Bartlett's Test of Sphericity	Approx. Chi-Square	1234.483
	df	136
	p-value	< 0.001
Cronbach's Alpha		0.592 (0.60)

Table 13 lists the eigenvalues associated with each linear attribute before extraction, after extraction and after rotation.

Table 13. Attribute Transformation Matrix of Organisational Stressors

	Initial Eigenvalues			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
Attribute	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	4.619	27.173	27.173	4.619	27.173	27.173	4.603	27.074	27.1
2	1.881	11.064	38.237	1.881	11.064	38.237	1.881	11.063	38.1
3	1.595	9.381	47.618	1.595	9.381	47.618	1.612	9.481	47.6
4	1.394	8.198	55.816						
5	1.230	7.236	63.051						
6	1.093	6.432	69.484						
7	0.975	5.738	75.221						
8	0.917	5.393	80.614						
9	0.642	3.777	84.391						
10	0.638	3.753	88.144						
11	0.499	2.933	91.077						
12	0.419	2.467	93.544						
13	0.335	1.968	95.512						
14	0.297	1.744	97.257						
15	0.235	1.380	98.636						
16	0.147	0.867	99.503						
17	0.084	0.497	100.000						

Figure 4 shows the scree plot, which left us with three factors, organisational policies, treatment and reward, autonomy and organisational structure, because the regression line was divided into three attributes and then became a nearly straight line. After extraction, Factor 1 (organisational policies,

treatment and reward) explains 27.074% of the total variances (11.063%, and 9.481%, for Factor 2 (autonomy) and Factor 3 (organisational structure), respectively), see Table 13.

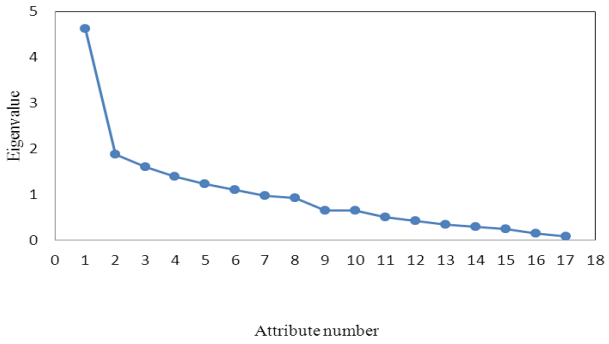

Figure 4. Scree Plot of the Organisational Stressors

The three-factor solution was presented in Table 14 with the respective loading scores. The reliability scores (Cronbach's Alpha) for the factors range from 0.480 to 0.888, indicating adequate internal consistency.

Table 14. Factor Loadings of the Organisational Stressors Attributes after Varimax Rotation Actors Profile of Organisational Stressors Attribute

Description of Factors and Attributes	**Factor Loading**	**Variance Explained**
Factor 1: Organisational policies, treatment and reward		
My company is not interested in my career.	0.924	27.1%
My company does not provide adequate support for my work.	0.903	
My company provides me with suitable career and promotion opportunities.	0.886	
The financial incentives and allowances provided by my company are generous	0.750	
I often feel unfair for the organisation treatment.	–0.724	
I find the reward I get is relatively low compared to my effort or the external market.	–0.547	
Factor 2: Autonomy		
I often have to consult other people before making a decision.	0.852	11.1%
An overabundance of rules and policies do not allow me the freedom to make my own decisions or use my own ideas.	0.802	
Factor 3: Organisational structure		
I am working in a politicised environment.	0.677	9.5%
I can get feedback from my supervisor on how well I am doing.	–0.547	
The company where I work is a bureaucracy.	0.542	

Factor 1: Organisational policies, treatment and reward

The first factor (organisational policies, treatment and reward) explains 27.1% of the total variance and comprises eight attributes. The "My company is not interested in my career" attribute has the highest factor loading. This indicates that construction professionals often experienced company negligence. The careers and advancement of employees were not considered to be important to the management, increasing the employees' stress. According to Leung, Chan and Yu (2008), companies did not provide a suitable job, job focus, and promotion opportunities to their employees, which increased their stress. Leung et al. (2005b) found that their respondents did not have many opportunities for upward career movement. The second important attribute in this factor is "My company does not provide adequate support for my work". This indicated that construction professionals suffered from lack of support by their company. Support means having trustworthy individuals who could provide helpful advice when the employee has problems. Feedback from the supervisor could enhance the performance of the employees. Leung et al. (2005b) stated that construction professionals find it difficult to keep up with the development and new technology in the industry due to a lack of support.

Factor 2: Autonomy

The second factor, autonomy, accounted for 11.1% of the total variance and contains two attributes that indicate the respondents' degree of autonomy. The majority of the attributes had relatively high factor loadings (≥ 0.802). The first attribute in this factor is "I often have to consult other people before making a decision". Construction professionals needed to refer matters to upper management, when they can address them adequately. This indicated that they had insufficient authority. This attribute has been strongly supported by Leung and Chan (2010), who that found that this attribute was the first source of autonomy. Additional support for this attribute was found in the Leung, Zhang and Skitmore (2008) and Leung, Skitmore and Chan (2007) studies. The "An overabundance of rules and policies do not allow me the freedom to make my own decisions or use my own ideas" attribute was found to have a strong effect on professionals' stress. Further agreement came from the Leung and Chan (2010) study that stressed the importance of this attribute in autonomy. Leung et al. (2005b) respondents asserted that new laws and regulations frequently require them to change the way they do things, which increased their stress.

Factor 3: Organisational structure

The third factor, organisational structure, explains 9.5% of the total variance and comprises three attributes. "I am working in a politicised environment" had the highest factor loading among the factor attributes. A politicised environment led to beliefs that conflict with those of the organisation (Leung, Zhang and Skitmore, 2008). Leung, Chan and Yu (2008) found that a politicised environment was the main source of organisational structure stressors. The second attribute in this factor is "I can get feedback from my supervisor on how well I am doing". Lack of feedback from the supervisor about an individual's performance led to

cumulative mistakes. Leung, Skitmore and Chan (2007), Leung, Zhang and Skitmore (2008) and Leung, Chan and Yuen (2010) found that their respondents suffered from stress due to a lack of feedback from their supervisor on how well they were doing. Furthermore, it is hard to receive information about their job performance.

CONCLUSION

The aim of this paper is to identify, evaluate and discuss the key stressors that lead to stress among construction professionals in the Gaza Strip. Four main stressor groups were identified: personal, task, physical and organisational. The results of this study indicated that personality-home-work conflict were the most prevailing personal stressors that caused stress to Gaza Strip construction professionals. This type of stress was induced because the construction professionals did not give attention to their personal lives in addition to their job. This devotion to work was usually in conflict with their devotion to their family as the social life and culture in the Gaza Strip requires more attention from individuals to their families. Huge job responsibilities also caused stress to the professionals. In addition, lack of team work among professionals caused stress.

Task stressors resulted from quantitative and qualitative work overload. Quantitative overload came from working for long hours with too much work to do, whereas qualitative overload resulted from a wide range of responsibilities. Although previous studies found that work overload, role conflict and ambiguity, and work under-load caused stress, the current study revealed that work overload was identified to be the only task stressor that caused stress. Physical stressors were not recognised to be a source of stress by Gaza Strip construction professionals. The "lighting in the office/workplace is not suitable" attribute had the highest factor loading among the factor attributes. This can be traced to the electricity problems in the Gaza Strip. This problem was responsible for stopping work for several hours during the day. The lighting problem was one of the most important consequences of shutting off the electricity. Insufficient safety equipment, irregular equipment checks and maintenance, unorganised equipment, and insufficient lighting were considered to be the main hazards in construction work.

The current study also showed that organisational stressors were identified by construction professionals in the Gaza Strip. First, the policies, treatment, and rewards were inadequate. This was induced from company negligence towards its employees' careers and advancement, which increased their stress. Second, a lack of autonomy was reflected by the insufficient authority that was given to the construction professionals. Third, the organisational structure imposed policies and rules that did not allow construction professionals to make decisions or use their own ideas. A politicised environment and lack of feedback from their supervisor were responsible for organisational structure stressors. This study will add value to the existing body of knowledge concerning Palestinian professionals' perspectives of stressors in the construction industry. Professionals can consider key stressors for managing stress in construction projects.

FUTURE RESEARCH AND RECOMMENDATIONS

The research presented in this paper is considered an initial step to identify the key stressors that lead to stress among construction professionals in the Gaza Strip, Palestine, using a quantitative survey. Therefore, additional qualitative approaches, such as interviews, case studies and focus groups, are required to validate the findings obtained in this study. In addition, future research needs to identify the relevant coping strategies that can address stress on construction projects, which may improve productivity. It would also be interesting to investigate the relationship between cultural values, stressors and performance among construction professionals.

Construction professionals in the Gaza Strip are recommended to use the identified key stressors in this research to manage and minimise their stress. Training sessions on managing and coping with stress are recommended for construction professionals. Such training can assist in reducing the stress factors among professionals and can lead to improved productivity. Construction firms should improve the employees' working environment to reduce stress. The identified key stressors could be used as a road map for stress elimination, and, hence, improve the performance of construction professionals.

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