

## Research Article

# Quantifying the Consequences of Perceived Stress in the Textile and Clothing Sector through Structural Equation Modelling

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Received 4 February 2021; Accepted 22 April 2021; Published 2 June 2021

Academic Editor: Kandasamy Jayakrishna

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The textile and clothing (T&C) sector plays an important role in the growth and industrial development of emerging economies. Work stress is a real concern for organizations with no immunity for the T&C sector. It hampers individual as well as organizational work performance that ultimately places a significant hurdle in achieving competitiveness in the market. This study aims at exploring the antecedents and consequences of work stress and how different causes of stress influence perceived stress among the employees of the textile and clothing organizations in Pakistan. Data were collected from 1470 employees of 24 organizations. Cohen's Perceived Stress Scale-10 (PSS-10) and two researcher-developed instruments (34 items and 22 items each) were used for the data collection. Information gathered was analyzed by PLS-SEM (partial least squares structural equation modelling) technique. Statistically significant results were found for the antecedents, namely, work-family conflict, role clarity, work characteristics, social working environment, managers' support at work, and training and career development, with work-family conflict as the most significant, and for the consequences, namely, psychological, emotional, physical, performance, and behavioral with psychological effect as the most significant. The findings of the study could help managers, designers, planners, and ergonomists in making more informed and proactive decisions while attempting to prevent or control the stress phenomenon in the T&C sector. Moreover, the study highlights the need for gaining more in-depth insight into the work-stress phenomenon proactively so that the effectiveness of intervention strategies might be assured.

## 1. Introduction

The textile and clothing (T&C) industry assumes a major role in the growth and industrial development of emerging economies and, hence, contributes to the global economy [1–3]. Also, as quoted by Cheng et al. [4], textile industry is acknowledged as a main economic area in developing countries. In some countries, textiles and clothing are the main export-oriented industrial sector, for example, Bangladesh has complete reliance on textiles

and garments with an 83.5% share of the total manufacturing exports, followed by Sri Lanka with 47% and Pakistan with 67.2% [5]. The T&C sector in Pakistan is one of the most prominent manufacturing industries that assume a central part in the country's economy as it offers employment to 30% of the country's total workforce, adds 8.5% to GDP, and continues to be the lifeblood for the country's exports at 52% of the total trade [6, 7]. Pakistan is amongst the main textiles producing regions of the world, as quoted by Wang et al. [8].

Work stress is a real concern for organizations with no immunity for the T&C sector. It hampers individual as well as organizational work performance that ultimately places a significant hurdle in achieving competitiveness in the market. Besides requiring the optimal utilization of resources, there is a need to implement the international standards related to the health and safety environment of organizations, fundamental human rights, etc. Workplace stress management is amongst the human resource management practices that have been found to be strong stimulator maximizing organizational execution [9]. The International Labour Organization [10] has called for improvements in compliance with International Labour Standards in the textile sector of Pakistan. The financial impact of workplace stress on organizations is enormous. It is revealed that, about 18% of working men and 25% of working women suffer from workplace stress [11]. In a recent VicHealth commission study, “\$730 million over one year and \$11.8 billion over a lifetime” have been anticipated as the cost of depression ascribed to work stress in the Australian working population. Employment ascribed the bulk of these costs, e.g., absenteeism and job turnover [11]. Likewise, forty million employees in the European Union suffered from job-associated stress [12]. According to a poll conducted by American Psychological Association [13], about 36% of the employees remained stressed throughout the working week which ultimately affected the organizational performance negatively and resulted in negative financial impact.

Keeping in view the importance of stress management, considerable work has been done (for example, Arnold et al. [14] and Kitronza and Mairiaux [15]) to identify the causes and consequences of workplace stress in different sectors. However, the stress literature on the T&C sector is scarce. Moreover, there is a need to further investigate the stress phenomenon and its complex underlying relationships with varying factors in T&C sector of developing countries so that more realistic and pragmatic prevention strategies may be designed and implemented. Furthermore, while attempting to prevent or control the stress phenomenon, it is perhaps inadequate merely to know about the causes of work stress. So, this study not only aims at finding the causes and consequences of workplace stress but also investigates the relationships of different contributing and resulting factors with the perceived stress in T&C sector organizations.

First, using exploratory sequential mixed methods’ design, instruments for measuring antecedents and consequences of work stress were developed. Later, using these instruments and Cohen’s PSS-10 scale, data were collected for the antecedents and consequences of work stress, as well as for the perceived stress. Finally, PLS-SEM was applied to the information gathered to achieve the objectives of the study. The results obtained through these techniques can be used to understand the role of different factors causing stress at work, and how each of them impacts the employees’ perceived stress level. Investigation of the causes in terms of their impact on perceived stress levels may help to reduce high impact causes, which, in turn, will result in promoting more effective and sustainable intervention mechanisms at work.

## 2. Literature Review

*2.1. Perceived Stress.* According to Selye, stress is “the non-specific response of the body to any demand made on it” [16]. Later, he described it as “the state manifested by a specific syndrome which consists of all the nonspecifically induced changes within the biological system” [17]. According to Lumsden [18], stress is viewed as “hardship or adversity,” while Cox and Griffiths [19] have described it as an “engineering approach.” Lazarus [20] gave the concept of cognitive appraisal according to which stress is the result of inequality between the demands placed on the person and the person’s resources to fulfill those demands [20, 21]. Stress is also defined as a negatively perceived anomaly which, because of inadequate dealing with the stressors, has adverse mental and physical health-related impacts [22–24]. Researchers have also investigated the attributes of “person-environment interaction” and, more considerably, the psychological progression through which it occurs [25]. Consequently, the modern outlook led the researchers to consider stress as the outcome of a “transaction” between the environment and the individual. The term “transaction” means stress is neither in the individual nor in the environment but the interconnection between the two [26]. Stress is increased when the individual perceives the demand for a particular transaction more than the resources available [27]. Therefore, stress arises when the extent of the stressor goes beyond the individual’s coping capacity. Nevertheless, perceived stress is an overall assessment of one’s stress and is the extent to which people find their lives “uncontrollable, unpredictable, and overloading” [28].

*2.2. Antecedents of Work Stress.* Substantial work has been done in identifying the antecedents of workplace stress in different sectors. In a study of sports performers, targets and execution stressors (time and intensity) and team and environment stressors (frequency and intensity) were found as organizational stressors [14]. In other studies, it was ascertained that relationship conflict and nontask organizational conflict [29], workplace bullying [30], alcohol consumption [15], and execution of illegitimate tasks are the causes of the employees’ job stress [31, 32]. Likewise, in other studies, high work-related demands, poor interpersonal communication, role ambiguity, working environment, and career development [33] have been identified as the job stressors. Therefore, working conditions, as well as the health and safety situation, in the textile and clothing sector organizations of Pakistan were found unfavorable to higher productivity [34]. Multiple hazards such as inadequate physical working conditions along with unacceptable temperature, humidity, and noise levels highlighted the need for training, awareness, and top management commitment [34].

*2.3. Consequences of Work Stress.* It is noteworthy that the effects of stress are reckoned to a degree by how the individuals react to it. For example, people for certain distressful situations are strong enough that they handle these situations easily, while in other cases, their response to the distressing circumstances might be unpleasant to their prosperity. Work stress has a negative effect on the

individual and organizational work performance [35, 36] and results in decreased efficiency, reduced capacity to work, diminished zeal, the rigidity of thoughts, absence of compassion for the organization and allies, increased turnover, lost commitment, and self-esteem [37–40]. It affects the human body negatively and results in nervousness, mental issues, stomach problems, and cardiovascular ailments [36], while prolonged severe stress has predicted poorer mental and physical health in young adulthood [41]. Similarly, loss of interest in the practice, tiredness, boredom, decline in health-related quality of life, and lack of focus and hindrance of alertness [42] were the effects of stress [43]. Likewise, a study on older African Americans revealed that higher levels of perceived stress cause quick declines in overall cognition [44]. Moreover, a study conducted on university employees concludes a higher level of depression and anxiety impact job satisfaction negatively [45]. An investigation conducted on the employees working in shifts identified that workplace stress affects employees' mental health negatively [46]. A study was carried among male and female workers to identify the effect of stress on their smoking behaviors in relation to gender differences. The study revealed a strong positive correlation between stress and increased smoking [47] where the effect was more for female workers. In a meta-analysis, quality of life was found to be negatively related to stress, and factors such as insomnia and burnout were also correlated with the deterioration [48].

### 3. Methodology

*3.1. The Proposed Hypothetical Model.* The conceptual and empirical research studies carried out in the areas of concern mentioned in Section 2 have yielded numbers of antecedents and consequences of work stress. On the basis of the theoretical background achieved from earlier studies and the current on ground scenario captured through the observations and interviews, some hypotheses were proposed to study this research and are placed in Table 1.

*3.2. General.* In attaining the research objectives, this study carried out a comprehensive literature review of journal papers, proceedings, and reports on the topic of job stress and its probable sources and consequences. Exploratory sequential mixed methods design has been used in the research project where qualitative and quantitative information was gathered. It is an approach that combines qualitative and quantitative data collection and analysis in a sequence of phases. There may be multiple causes and consequences of stress at work which may vary from sector to sector and also from region to region. The situation necessitated the development of the sector as well as region-specific instruments. Under this motivation, the instruments were developed. For getting an in-depth insight into the prevailing situation in the selected industrial sector and incorporating the necessary information for the survey instrument, physical observations and focus group discussions were carried out in some textile and clothing sector organizations. The process helped in designing the data collection instruments for the antecedents

TABLE 1: Hypotheses of the study.

H1.1: existence of the physical hazards at the workplace is positively correlated with the work stress
H1.2: absence of role clarity is positively correlated with the work stress
H1.3: absence of control and decision latitude among the employees is positively linked with the work stress
H1.4: dearth of career development and training of the employees is positively related to the workplace stress
H1.5: work-family conflict is positively related with work stress
H1.6: poor working conditions at the workplace are positively correlated with the work stress
H1.7: poor hygienic conditions are positively correlated with the work stress
H1.8: poor work characteristics are positively correlated to the work stress
H1.9: lack of managers' support at work is positively correlated with employees work stress
H1.10: poor social working environment is positively correlated with the employee work stress
H2.1: the employee work stress and thereupon "negative physical effects" on them are significantly correlated
H2.2: employee work stress is negatively correlated with the employee's performance
H2.3: employee job stress affects employees' emotions negatively
H2.4: employee work stress has negative effects on the employees' behaviors
H2.5: the impact of work environment stress on the employees is hypothesized to be positive with the employees' psychology

and the consequences of stress in order to meet the objectives of the study. Deploying exploratory factor analysis (EFA) on the data collected through a pilot study, instruments were finalized for the final data collection. These instruments were named as Antecedents of Perceived Stress (APS) and Consequences of Perceived Stress (CPS). However, being not the purview of the study, the detailed procedure for the instrument development (part of phase 1) has not been illustrated here. Furthermore, Sheldon Cohen's PSS-10 (Perceived Stress Scale-10), an established instrument, was used to measure the perceived stress of the participants [49]. This scale is one of the well-accepted instruments for gauging psychological stress. It is a self-reported instrument developed to determine "the degree to which individuals appraise situations in their lives as stressful." A number of researchers have extensively used the said scale [50–53]. The research strategy used in the present study was a cross-sectional survey. Before running the survey, measures were handed out to the participants and all of them were informed about the inspiration driving the research and its procedure and substance.

*3.3. Participants and Procedure.* The study was carried out on the employees ( $N = 1470$ ) of 24 export-based textile organizations in Pakistan. For collecting a more comprehensive and diverse opinion pool, four zones of the textile sector, explicitly, fabric manufacturing, home textiles, apparel manufacturing, and socks manufacturing were selected. Irrespective of gender, individuals were employed in divergent positions in diverse departments with varied career spans qualified for inclusion in the study. No minimum period of employment years was required

for the participants to be included in the survey. Permission for conducting surveys was sought in writing from multiple textile and clothing sector organizations and thereupon telephonically as well as in-person follow-up was made. The survey was carried out after getting ethical approval from the employer of the respective organization. The chosen 24 companies are those which accorded permission. Therefore, the sampling used in the study, up to the extent of organization selection, is convenience sampling. These 24 companies represent the major subsectors of T&C, namely, fiber/fabric manufacturer, apparel/garment manufacturer, socks manufacturer, and home textiles. Before completing the survey, the questionnaire was handed out to the participants and all of them were informed about the inspiration driving the research as well as its procedure and substance. The survey administrators remained accessible to the respondents throughout the process of recording their responses so that they could help them in case of queries. They also checked the filled questionnaires immediately for any omitted information. The anonymity of information supplied by the individuals was guaranteed.

**3.4. Instruments.** Three survey instruments were deployed to attain the goals of the study.

**3.4.1. Instrument for Perceived Stress (Cohen's PSS-10).** PSS-10 is a well-established tool to measure the perceived stress [49]. As evident from the name, it consists of 10 items (Table 2). As shown in Appendix A in Supplementary materials (available here), in the PSS-10 scale, respondents were to react on a 5-point scale which ranged from 0 (never) through 4 (always), where 0 designates no stress and 4 designates high stress: 0\_never, 1\_seldom, 2\_sometimes, 3\_often, and 4\_always. The items (worded positively) at serial numbers 4, 5, 7, and 8 were reversed in their direction for score calculations. The internal consistency of this instrument was also confirmed through Cronbach's alpha value and was found as 0.741 (Table 3), a quite reasonable value [54].

**3.4.2. Instrument for Antecedents (APS).** APS is a self-designed instrument and consisted of 34 items. It was used to identify the antecedents of work stress. Here, the opinion of the participants was acquired on a 5-point Likert-type scale which ranged from 1 (signifying no stress) through 5 (signifying high stress): 5 = strongly agree or always, 4 = agree or often, 3 = partially agree or sometimes, 2 = disagree or seldom, and 1 = totally disagree or never, as per the need of the given statements. However, for positive items, the scores were reversed. The reliability of the instrument was confirmed through Cronbach's alpha values and found as 0.921 (Table 3), much above the minimum threshold of 0.70 [54].

**3.4.3. Instrument for Consequences (CPS).** CPS emerged from 22 items was also a self-designed instrument developed to identify the consequences of work stress. Again, the

opinions of the respondents were recorded on a 5-point Likert-type scale which ranged from 1 (signifying no stress) through 5 (signifying high stress): 5 = strongly agree or always, 4 = agree or often, 3 = partially agree or sometimes, 2 = disagree or seldom, 1 = totally disagree or never (Appendix A in Supplementary Materials). The reliability of the instrument was confirmed through Cronbach's alpha values and found as 0.940 (Table 3), a reliable value [54].

**3.5. Statistical Procedure.** First of all, the study investigated potential stress components for both the antecedents and the consequences by using EFA where PCA (principal component analysis) was used as an extraction technique and Oblimin with Kaiser Normalization as the rotation. Contrary to common factor analysis, PCA is the default extraction method of factor analysis, and researchers have extensively used it in similar studies [55, 56]. Finally, this study utilized the PLS-SEM to find the associations linking the components identified and the perceived stress. SPSS version 23 and Smart PLS 3.2.8 were employed to carry out the statistical analyses [57].

## 4. Results

**4.1. Exploratory Factor Analysis.** KMO values between 0.8 and 1 indicate the sampling is adequate [58]. The KMO values for antecedents as well as consequences, as shown in Table 4, clearly indicated the adequacy of data for factor analysis. Also, the significance value of Bartlett's test of sphericity as 0.0001 (less than the threshold of 0.001 [59]) showed the validity and suitability of the information collected for EFA.

The EFA yielded 10 components (34 items) for the antecedents and 5 components (20 items) for the consequences of stress. The instrument for consequences (CPS) was composed of "22" items; however, the deployment of the EFA on the data collected resulted in 5 components comprising "20" items. The components extracted for the antecedents as well as for the consequences described an adequate cumulative variance of 70.6% and 67.2%, respectively, surpassing the threshold of 60%. The extraction of the components was done based on the screen plot approach. In both cases, the loading of items on their respective components was beyond or around 0.50. The components were named in accordance with their relevance to the items loaded on them, as shown in Table 5.

**4.2. Partial Least Square Structural Equation Modelling (PLS-SEM).** This study employed Smart PLS 3 release 3.2.8 software [60] to investigate the relationships of perceived stress with the antecedents and the consequences. Interpretation of the results involves two steps: assessment of the measurement model and evaluation of the structural model.

**4.2.1. Testing the Measurement Model.** The results of the measurement model disclose that every single least prerequisite was fulfilled for further analysis (Figure 1, Tables 6 and 7, and Appendices A–C in Supplementary Materials).

TABLE 2: Items of instrument for perceived stress (Cohen’s PSS-10).

Item no.	Description of the item/indicator
1	How often have you been upset because of something that happened unexpectedly?
2	How often have you felt that you were unable to control the important things in your life?
3	How often have you felt nervous and “stressed”?
4	*How often have you felt confident about your ability to handle your personal problems?
5	*How often have you felt that things were going your way?
6	How often have you found that you could not cope with all the things that you had to do?
7	*How often have you been able to control irritations in your life?
8	*How often have you felt that you were on top of things?
9	How often have you been angered because of things that happened that been outside of your control?
10	How often have you felt difficulties were piling up so high that you could not overcome them?

\*denotes positively worded items.

TABLE 3: Instruments used in the study and Cronbach’s alpha values.

Sr. No.	Instrument	No. of items	Cronbach’s alpha value
1	Instrument for Perceived Stress (Cohen’s PSS-10)	10	0.741
2	Instrument for antecedents (APS)	34	0.921
3	Instrument for consequences (CPS)	22	0.940

TABLE 4: Kaiser–Meyer–Olkin (KMO) and Bartlett’s test.

		For antecedents	For consequences
Kaiser–Meyer–Olkin measure of sampling adequacy		0.917	0.968
	Approx. Chi-square	52029.411	39108.072
Bartlett’s test of sphericity	df	561	231
	Sig.	0.0001	0.0001

TABLE 5: Components for the antecedents and consequences of work stress.

Antecedents (APS) (total variance explained 70.6%)				Consequences (CPS) (total variance explained 67.2%)			
Sr. no.	Component name	No. of items	Variance explained	Sr. no.	Component name	No. of items	Variance explained
1	Work-family conflict	5	28.977	1	Psychological	7	45.746
2	Role clarity	3	11.160	2	Emotional	3	6.497
3	Managers’ support at work	3	5.513	3	Performance	4	6.219
4	Physical agents at work	5	4.915	4	Physical	4	5.154
5	Social working environment	4	4.310	5	Behavioral	2	3.564
6	Training and career development	3	3.658				
7	Control and decision latitude	3	3.465				
8	Hygienic conditions	2	3.248				
9	Work characteristics	3	2.765				
10	Working conditions	3	2.548				

Initially, a threshold for factor loading as 0.70 with  $p$  value  $<0.05$  and  $t$  value  $>1.96$  was observed (Figure 1 and Table 7). A higher level of outer factor loading confirms a superior level of indicator reliability, as shown in Figure 1 and Table 7 [61, 62].

Afterward, the measures’ internal consistency for all latent variables was also confirmed by computing the composite reliability and Cronbach’s alpha values. Usually, in social sciences, the reliability of the instrument is tested through checking of inner consistency which is done by calculating the “Cronbach’s alpha” values. However, in PLS-SEM, previous

literature has recommended considering the value against “Composite Reliability” a substitute [62, 63]. All the values of composite reliabilities and Cronbach’s alpha are larger than 0.70 which confirms the reliability of the measures’ internal consistency as well [54, 61, 63, 64] (Table 6).

Likewise, in establishing the validity of the constructs, discriminant validity and convergent validity were checked [65]. The convergent validity was measured construct-wise as well as item-wise. Subsistence of all the AVE (average variance explained) values greater than 0.50 (Table 6) indicates construct-wise convergent validity [66, 67], whereas



FIGURE 1: PLS structural equation modelling.

the existence of all the loading values greater than 0.70 (except one which is close to 0.70) confirm item-wise convergent validity (Figure 1 and Table 7) [68]. After successfully establishing the reliability as well as constructs' convergent validity, the constructs' discriminant validity was evaluated.

The discriminant validity evaluates the degree to which a construct is experimentally not quite the same as different constructs in the path model, both as far as the extent to which it relates with some other constructs, regarding how markedly the indicators correspond to only this particular construct. In summary, discriminant validity confirms the distinctive

TABLE 6: Results summary for latent variables.

Latent variable	Composite reliability	Cronbach's alpha	AVE	R square	Q square
Behavioral (Behav)	0.895	0.765	0.809	0.174	0.136
Control and decision latitude (C&DL)	0.877	0.720	0.781		
Emotional (Emot)	0.872	0.781	0.695	0.227	0.15
Hygienic conditions (HCond)	0.911	0.817	0.837		
Managers' support at work (MS)	0.933	0.857	0.686		
Perceived stress (PS)	0.852	0.768	0.592	0.232	0.128
Performance (Perfo)	0.884	0.825	0.656	0.178	0.111
Physical (Phys)	0.881	0.821	0.650	0.207	0.127
Physical agents at work (PAatW)	0.904	0.867	0.653		
Psychological (Psycho)	0.920	0.899	0.622	0.237	0.14
Role clarity (RC)	0.874	0.786	0.698		
Social working environment (SWE)	0.893	0.839	0.676		
Training and career development (T&CD)	0.828	0.701	0.713		
Work characteristics (WChar)	0.902	0.838	0.755		
Work-family conflict (WFC)	0.894	0.853	0.629		
Working conditions (WCond)	0.850	0.735	0.654		

TABLE 7: Latent variables, indicator/item name, item description, and loadings.

Latent variable	Indicator/Item name	Item description	Loadings
Physical agents at work (PAatW)	PAatW_1	Physical dangers exist in the workplace	0.818
	PAatW_2	My job requires me to touch potentially harmful substances or material	0.821
	PAatW_3	My job exposes me to breathing fumes, dust, or other harmful substances	0.856
	PAatW_4	I have work tasks that leave me with a ringing in my ears or a feeling of temporary deafness	0.796
	PAatW_5	I work in an environment where the level of background noise disturbs me	0.745
Role clarity (RC)	RC_1	I am clear what my duties and responsibilities are	0.830
	RC_2	I am clear about what is expected of me at work	0.892
	RC_3	I know how to go about getting my job done	0.781
Control and decision latitude (C&DL)	C&DL_2	I am clear what my duties and responsibilities are	0.887
	C&DL_3	I am clear about what is expected of me at work	0.880
Training and career development (T&CD)	T&CD_2	There are enough development opportunities for me in this organization	0.985
	T&CD_3	This organization is providing me with job-specific training	0.677
Work-family conflict (WFC)	WFC_1	My job takes up so much energy I do not feel up to doing things that need attention at home	0.810
	WFC_2	Problems at work make me irritable at home	0.840
	WFC_3	My job does not allow me enough time for my family	0.798
	WFC_4	Family obligations reduce the time I need to relax	0.746
	WFC_5	Family worries or problems distract me from my work	0.768
Working conditions (WCond)	WCond_1	The equipment which I work with is poorly maintained	0.854
	WCond_2	I have to work in inadequate lighting	0.817
	WCond_3	My workplace is too cold	0.751
Hygienic conditions (HCond)	HCond_1	I am worried about the "hygienic conditions" of food served at the canteen of the workplace	0.872
	HCond_2	I am worried about the "hygienic conditions" of drinking water at the workplace	0.956
Work characteristics (WChar)	WChar_1	I have to do the same thing over and over again	0.859
	WChar_2	I have to work very fast	0.880
	WChar_3	My workload is too heavy	0.867
Managers' support at work (MS)	MS_1	I can rely on my line manager to help me out with a work problem	0.945
	MS_2	My line manager encourages me at work	0.925
Social working environment (SWE)	SWE_1	I experience too much discrimination in the organization	0.806
	SWE_2	I am subject to personal harassment in the form of unkind words or behavior	0.879
	SWE_3	I am subject to bullying at work	0.850
	SWE_4	There is friction or anger between colleagues	0.749

TABLE 7: Continued.

Latent variable	Indicator/Item name	Item description	Loadings
Physical (Phys)	Phys_1	I Have felt tired	0.792
	Phys_2	I Have headaches	0.841
	Phys_3	I get tension or muscle spasms/pains in my face, jaw, neck, chest, head, lower back, or shoulders	0.779
	Phys_4	I lack physical energy	0.813
Performance (Perfo)	Perfo_1	Often, I am unable to complete the task as per schedule	0.789
	Perfo_2	My judgment is clouded or not as good as it was	0.841
	Perfo_3	I am ineffective in resolving family issues	0.824
	Perfo_4	Usually, I am unable to do all the things in a day that I must do	0.784
Behavioral (Behav)	Behav_1	My appetite has been changed; I have either a desire to binge or have a loss of appetite/may skip meals	0.857
	Behav_2	I seem to be listening even though I am preoccupied with my own thoughts	0.882
	Behav_3	I tend to eat, talk, walk, and drive quickly	0.712
Emotional (emot)	Emot_1	I have become short-tempered	0.825
	Emot_2	I become very frustrated at having to wait in a queue	0.847
	Emot_3	I experience mood swings	0.828
Psychological (Psycho)	Psycho_1	I suffer from frequent depression	0.803
	Psychol_2	I experience worsening relations with colleagues, family, and friends	0.754
	Psycho_3	I often suffer from sleeplessness	0.790
	Psycho_4	I used to avoid people	0.788
	Psycho_5	I often suffer from anger/hostility	0.806
	Psycho_6	I have had dizzy spells	0.803
	Psycho_8	I often suffer from anxiety	0.775
	Perceived stress (PS)	PS_1	How often have you been upset because of something that happened unexpectedly?
PS_2		How often have you felt that you were unable to control the important things in your life?	0.804
PS_3		How often have you felt nervous and “stressed”?	0.815
PS_10		How often have you felt difficulties were piling up so high that you could not overcome them?	0.674

conception of items and their constructs [69]. Subsequently, the *discriminant validity* of the constructs was assessed. It was measured construct-wise as well as items-wise. The Fornell–Larcker [70] criterion, the most conservative method, was used in evaluating construct-wise *discriminant validity*. According to the Fornell–Larcker [70] criterion, the square root of the AVE of each construct should be higher than its highest correlation with any other construct. As shown in Appendix B in Supplementary Materials, higher values at the diagonal confirm the fulfillment of the Fornell–Larcker criterion. Another approach in assessing discriminant validity is “Cross-Loadings” which was also examined. Accordingly, as shown in Appendix D in Supplementary Materials, the existence of greater item loading on the constructs to which they belong than to other constructs confirms the item-wise discriminant validity as well [71].

Discriminant validity assessment in PLS-SEM also involves analyzing HTMT (heterotrait-monotrait ratio) of correlations. In this method, heterotrait-monotrait ratio (HTMT) of the correlations is examined [72]. It is given that big HTMT values show issues with the discriminant validity. In the light of earlier research and their simulation contemplate results, Henseler et al. [73] recommend an edge estimation of 0.90 in case the path model comprises

constructs that are theoretically much alike (e.g., cognitive satisfaction, affective satisfaction, and loyalty); that is to say, in this circumstance, an HTMT value surpassing 0.90 proposes an absence of discriminant validity. Notwithstanding, when the builds in the path model are theoretically diverse, researchers ought to consider 0.85 as the limit for HTMT [73]. Here, as shown in Appendix C in Supplementary Materials, all the values were found within the threshold of 0.85. Consequently, the discriminant validity was confirmed this way as well.

The evaluation of the model’s quality concerning its potentiality to envisage the endogenous constructs was also confirmed through cross-validated redundancy ( $Q^2$ ) and coefficient of determination ( $R^2$ ) values. According to the recommended values,  $R^2$  values are higher than 0.2, while  $Q^2$  values were greater than zero as provided in Table 6 [63, 74–76]. The model was also tested for the potential multicollinearity issue among the predictors. The VIF values within the threshold (0.5) confirmed that there was no issue of multicollinearity [77].

**4.2.2. Testing Path Model.** In testing the path model, this research study utilized Smart PLS3 release 3.2.8 [57] as depicted in Figure 1. The bootstrapping procedure used data

of 1470 participants and 1,000 samples. In deploying PLS-SEM analyses and thereupon disclosing the findings, recent guidelines for PLS-SEM given by Hair et al. [77], Hair et al. [63], and Hair et al. [61] were considered. As mentioned in the preceding section, the measurement models were weighed up before evaluating the structural model.

The path is considered to be significant if the  $T$  statistics is above 1.96 using a two-tailed  $t$  test under 5% significance level [61]. Table 6 demonstrates the nonsignificance of the paths' physical agents at work  $\rightarrow$  perceived stress and working conditions  $\rightarrow$  perceived stress having  $p$  values 0.825 and 0.124, respectively. In the inner model, all other path coefficients are statistically significant and have  $T$  statistics greater than 1.96, yet control and decision latitude  $\rightarrow$  perceived stress and hygienic conditions  $\rightarrow$  perceived stress having beta values 0.096 and 0.080 (less than 0.10), respectively, indicate weak relationships.

Amongst the antecedents, work-family conflict is the most significant component (Table 5) and the results of the path analysis have validated the findings of the EFA. The component work-family conflict has the highest beta value (0.244) among the components of antecedents (Table 8) and thus showed a strong and significant positive correlation with the dependent variable, i.e., perceived stress. The results of the examination disclose that if other aspects remain constant, with one unit increase in work-family conflict, perceived stress will increase by 0.244. Likewise, according to EFA results, the component working condition is the least significant (Table 5); path analysis results revealed its relationship as nonsignificant. However, for the component physical agents at work, the EFA results and path analysis results are not aligned. The component, according to EFA, is the fourth significant (Table 5) while, according to path analysis, its relationship with the dependent variable (perceived stress) is nonsignificant (Table 8). In context to their EFA and path analysis results, the rest of the components of antecedents are more or less aligned up.

In case of consequences, the results, EFA and path analysis, are exactly in the same order except for one situation that is between performance effects and physical effects. The component psychological effect, as per EFA results, is the most significant (Table 5). Having beta value 0.487 and  $p$  value 0.0001, the path of the component with the dependent variable (perceived stress) is significant and most strong (Table 8). The results of the examinations about consequences reveal that if other variables remain constant, one unit increment in perceived stress will increase the psychological effect by 0.487, emotional effect by 0.476, physical effect by 0.455, performance effect by 0.422, and behavioral effect by 0.417.

On the basis of the analysis, the hypotheses build in the second phase of this case study and placed in the proposed hypothetical model section can be concluded as shown in Table 9.

## 5. Discussion

The objectives of this study were to determine the antecedents and consequences of work stress among the

employees of the textile sector organization in Pakistan ( $N=1470$ ) and also to investigate the relationships of the antecedents and the perceived stress and the relationship of the perceived stress with the consequences. Stress literature on the textile sector is scarce, and even the available literature does not cover the sector as a whole. For example, Steinisch et al. [78] worked on a single garment factory with a limited sample of 332. On the contrary, the present study provides a more comprehensive investigation of stress phenomena among the employees of textile industries as this covers almost all areas of the textile sector (fiber/cloth manufacturing, home textiles, apparel manufacturing, and sock manufacturing) with a substantial sample size (1470) belonging to 24 diverse companies. Additionally, this not only identifies antecedents and consequences of stress in the sector but also highlights how they are associated with the employees' perceived stress. According to the relational findings of the antecedents, work-family conflict ( $\beta=0.0.244$  and  $p=0.0001$ ) has the highest impact on the perceived stress followed by role clarity ( $\beta=0.193$  and  $p=0.0001$ ), work characteristics ( $\beta=0.176$  and  $p=0.0001$ ), and social working environment ( $\beta=0.161$  and  $p=0.0001$ ). Similarly, among the outcomes of work stress, psychological ( $\beta=0.487$  and  $p=0.0001$ ) has the highest effect of the perceived stress on the subjects followed by emotional ( $\beta=0.476$  and  $p=0.0001$ ), physical ( $\beta=0.455$  and  $p=0.0001$ ), and performance ( $\beta=0.422$  and  $p=0.0001$ ) effects. There were seven items in the component psychological. The items, in order of their strength, are Psycho\_5: I often suffer from anger/hostility, Psycho\_1: I suffer from frequent depression, Psycho\_6: I have had dizzy spells, Psycho\_3: I often suffer from sleeplessness, Psycho\_4: I used to avoid people, Psycho\_8: I often suffer from anxiety, and Psycho\_1: I experience worsening relations with colleagues, family, and friends (Figure 1 and Table 7).

Multiple studies have been carried out in identifying the antecedents of work stress in general. In a study on a limited sample of managers of the textile industry in Pakistan, support at work, the work-family interface, social working environment, and role were identified as the potential factors for the antecedents of work stress amongst physical agents at work, and social working environment were found to be positively and strongly correlated with work stress [3, 79]. The present study, carried out on a large sample size from T&C sector employees, revealed a social working environment as an antecedent where workplace bullying [30] is one of its indicators (Table 3). A study carried out at a manufacturing plant revealed that work-family conflict and abusive supervision were positively correlated with unsafe commuting behavior [80] which is the impact of stress [81]. Work-family conflict is the most significant antecedent of stress in the present study. The current research has supported almost all the stressors, namely, role ambiguity, work overload, career development, working relationship, and working environment found in the study on industrial zone employees of Vietnam [33]. Work overload, work environment, and work-family conflict were also found as stressors for working mothers in Pakistan [82]. In a study on employees of the UK and Pakistan, organizational factors were found as stress

TABLE 8: Path coefficients retrieved from bootstrapping procedure.

Structural path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ( O/STDEV )	p values	f square
Physical agents at work → perceived stress	0.007	0.006	0.033	0.221	0.825	0.0001
Role clarity → perceived stress	0.193	0.191	0.03	6.491	0.0001	0.037
Control and decision latitude → perceived stress	0.096	0.093	0.03	3.244	0.001	0.009
Training and career development → perceived stress	-0.13	-0.112	0.042	3.076	0.002	0.015
Work-family conflict → perceived stress	0.244	0.241	0.038	6.468	0.0001	0.038
Working conditions → perceived stress	0.048	0.047	0.031	1.538	0.124	0.002
Hygienic conditions → perceived stress	-0.08	-0.081	0.033	2.422	0.016	0.005
Work characteristics → perceived stress	0.176	0.173	0.036	4.869	0.0001	0.023
Managers' support at work → perceived stress	-0.146	-0.146	0.04	3.618	0.0001	0.018
Social working environment → perceived stress	0.161	0.161	0.035	4.586	0.0001	0.018
Perceived stress → physical effect	0.455	0.455	0.025	18.133	0.0001	0.261
Perceived stress → performance effect	0.422	0.423	0.028	15.231	0.0001	0.217
Perceived stress → emotional effect	0.476	0.476	0.022	21.248	0.0001	0.293
Perceived stress → behavioral effect	0.417	0.418	0.025	16.478	0.0001	0.211
Perceived stress → psychological effect	0.487	0.488	0.025	19.666	0.0001	0.310

TABLE 9: Results of the hypothesis build for the case study.

Hypothesis	Conclusion
H1.1: existence of the physical hazards at the workplace is positively correlated with the work stress	Rejected
H1.2: absence of role clarity is positively correlated with the work stress	Accepted
H1.3: absence of control and decision latitude among the employees is positively linked with the work stress	Rejected
H1.4: dearth of career development and training of the employees is positively related to the workplace stress	Accepted
H1.5: work-family conflict is positively related with work stress	Accepted
H1.6: poor working conditions at the workplace are positively correlated with the work stress	Rejected
H1.7: poor hygienic conditions are positively correlated with the work stress	Rejected
H1.8: poor work characteristics are positively correlated to the work stress	Accepted
H1.9: lack of managers' support at work is positively correlated with employees' work stress	Accepted
H1.10: poor social working environment is positively correlated with the employee work stress	Accepted
H2.1: the employee work stress and thereupon "negative physical effects" on them are significantly correlated	Accepted
H2.2: employee work stress is negatively correlated with the employees' performance	Accepted
H2.3: employee job stress affects employees' emotions negatively	Accepted
H2.4: employee work stress has negative effects on the employees' behaviors	Accepted
H2.5: the impact of work environment stress on the employees is hypothesized to be positive with the employees' psychology	Accepted

antecedents for male employees while personal factors for females [83]. In another study, "organizational constraints" (OCs) were found as a unique stressor [84] besides personal situations, tasks, organizational settings, and physical conditions, [36] which, evidently, are OCs, and in the present study, the components role ambiguity and work characteristics found among the significant components also belong to OCs. Similarly, in a study on the employees of a garment factory in Bangladesh, "high work-related demands" and "poor interpersonal communication" were found as the critical stress components. The significant indicators were time pressure and support, respectively, while "work-related values" was nonsignificant indicator; freedom was also among the indicators [78]. The present study has supported all three indicators in the same order: the heavy workload is one of the indicators of a significant component work characteristics yielding workload as a stressor. Poor economic conditions might be one of the reasons behind the heavy workload as

most of the employees used to work for extra time so that they could manage their livelihood. This "working for overtime phenomenon" is not only contributing to their stress level but also adversely affecting their family lives and giving rise to the work-family conflict which in our study has appeared as the most significant antecedent of stress.

Likewise, in a meta-analysis performed by Pindek and Spector [84], behavioral, physical, and psychological factors, consistent with the present study, were found as the outcomes of stress. A study on a limited sample of managers of textile sector organizations in Pakistan, revealed physical, psychological, behavioral, performance, and physiological as the potential factors for the consequences of work stress [85]. The present study carried out on a big sample size of the T&C sector employees, supported all the same factors except physiological. Secondly, the order of factors is different. Contrarily, psychological is the most significant stress component of the present study; a big difference in the

sample sizes might be a reason behind diversity in the results. Ashong et al. [42] found tiredness as a stressor; it is one of the indicators of physical effects identified in the present study. In some earlier studies, decreased efficiency, reduced capacity to work, and diminished zeal [3, 37–39] were found as the consequences of stress. These items relate to the factor performance effects identified in the present study.

*5.1. Practical Implications.* This research concludes that work stress is a complex phenomenon, which is linked with multiple causes in the T&C sector and has serious implications for individuals and organizations. As this research provides necessary information about the antecedents and consequences, interventions can be designed accordingly in addressing these issues proactively. In this respect, the design and implementation of related interventions can be inculcated through better understanding and awareness among the stakeholders, mainly employees and managers.

Thus, the findings of the study can help managers, designers, planners, and ergonomists in making more informed and proactive decisions while attempting to prevent or control the stress phenomenon in the T&C sector. Specifically, the results of this study would provide an opportunity to understand the role of different factors such as work-family conflict, training and development needs of the employees, role clarity, physical agents, and management support in the context of the work-stress phenomenon. In this way, these insights could help managers in the dissemination of decisions, aiming at addressing these issues at some earlier decision-making stages. Moreover, this research also provides information regarding the consequences of work stress in the T&C sector. Therefore, the outcomes help raise awareness about the consequences of employees' stress at work, and their implications for the organization, especially the reduced performance at the workplace.

*5.2. Limitations and Future Research.* To carry out very comprehensive research on such a complex issue has been a challenging job. In spite of valuable contributions in the area of work-stress management, certainly this research has some limitations. For example, information gathering from the participants has been a much difficult area in the study. In certain cases, the employers did not allow them to conduct the study in their organizations. Access to the employees for data collection has been a major limitation of the study. Therefore, the sample used in the study, up to the extent of organization selection, is based on convenient sampling so the generalizability of the results is limited. Further investigations might be carried out by employing probability-based sampling so that more generalized conclusions could be made. As the data was collected from the textile industry in Pakistan, so the findings might not be the same for other regions because of changing organizational settings, policies, procedures, and culture. Further investigations might be done in other sectors and comparisons could be made. Stress management is the area where the research activities should be continued. A subsector-focused and even organization-focused research is recommended as a future work where both quantitative and

qualitative data collection should be carried out on the causes, effects of work stress, and also on the proposed interventions which is the ultimate goal of stress management. Future research can be designed to explore the stress management interventions where the objective should be to reduce the antecedents identified in the present study. Future studies should employ probability-based sampling techniques even in the selection of organizations. Ikram et al. [86] suggested that the traditional textile sector should be developed through proper governance framework such as triple helix model, so future researchers are advised to investigate the implication of such governance frameworks in the context of textile sector of Pakistan.

## 6. Conclusion

This cross-sectional research aimed at investigating the antecedents and consequences of work stress and also their association with the perceived stress among employees of T&C sector organizations. For this purpose, data were collected from 1470 employees of 24 related organizations. Cohen's PSS-10 was used to gauge the level of perceived stress of the subjects, while researcher-developed instruments were used to gather data for the identification of antecedents and consequences. Mainly, EFA and PLS-SEM were employed on the information gathered. EFA identified ten components for the antecedents and five components for the consequences of stress, while PLS-SEM yielded six antecedents to have a not only significant but also a strong effect on the perceived stress, which, in turn, was having a significant and strong impact on all the five consequences. The antecedents in order of their strength are work-family conflict, role clarity, work characteristics, social working environment, managers' support at work, and training and career development, whereas the consequences in the same order are psychological, emotional, physical, performance, and behavioral. Taking into account the antecedents identified, the conflicts between work and family affairs, issues about the clarity of employees' roles in the workplaces, workload, completion deadlines, task repetitiveness, bullying and discrimination, training and career development, and lack of managers' support need to be addressed in managing the stress of employees. In the dearth of such studies, especially in the T&C sector, the findings of the study are expected to help managers, designers, planners, and ergonomists in taking more informed and proactive decisions that are likely to be more effective for a broader range of the working population. Moreover, the study further highlights the need for gaining a somewhat more in-depth insight into the work stress phenomenon proactively so that the effectiveness of intervention strategies might be assured. This study provides a good insight into the complexity of the stress phenomenon and can be linked with similar kinds of working environments.

## Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

## Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

## Authors' Contributions

Aftab Ahmad and Amjad Hussain conceptualized the study. Aftab Ahmad, Asif Mahmood, and Ayyaz Ahmad developed the methodology. Aftab Ahmad and Shagufta Yasmin collected data and carried out field visits. Aftab Ahmad, Asif Mahmood, Ayyaz Ahmad, and Amir Ikram validated and analysed the study. Aftab Ahmad, Amjad Hussain, and Amir Ikram wrote the original draft. Shagufta Yasmin and Amir Ikram wrote the revised draft.

## Acknowledgments

The cooperation of the industry in information gathering is acknowledged.

## Supplementary Materials

Appendix A (survey instrument): the questionnaire was used for the operationalization of the study and data collection. Appendix B: discriminant validity (construct-wise) retrieved from "Fornell–Larcker criterion." Appendix C: heterotrait-monotrait ratio (HTMT) of correlations. Appendix D: cross loadings for assessing discriminant validity. (*Supplementary Materials*)

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