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Original Article

Association between job control and psychological health in middle-level managers

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Abstract: The present study analyses the effect of job control at work on psychological stress for Indian Middle-Level Managers (MLMs) of a public telecom organisation. Two hundred ten MLMs from different parts of India have participated in the survey. Three dimensions of job control visualize control over work (CoW), control over working time (CoT1) and control over working days (CoT2), were considered. The validity and reliability were confirmed using Factor and reliability analysis. A Binary Logistics Regression (BLR) was performed to find the effect of job control on behavioural, somatic and cognitive stress controlling for age, gender, and experience. The Odds Ratio and Adjusted Odds ratio were calculated. 56% of the participants reported suffering from psychological stress. Results showed that CoT1 had a significant association with somatic stress while CoT1 and CoT2 with cognitive stress. Low CoW and low CoT2 were associated with high psychological stress among middle-level managers while low CoT1 to low psychological stress. The findings indicate that job control have both positive and negative relationships with psychological well-being depending on its dimension. Increasing job control cannot entirely ensure the psychological well-being of employees. Therefore, organisations need to assess different dimensions of job control carefully before providing work flexibility to employees.

Key words: Control over work, Control over time, Psychological stress, Middle-level managers

Introduction

In the last two decades, organisations have significantly changed to a flexible working environment. Changes in technology have enabled organisations to provide more working flexibility to their employees. Also, this increased focus over work flexibility is because of its assumed positive effects on various organisational and employee-related factors such as less resource requirements, in time job completion, and less occupational stress[1)]. Work flexibility is also identified as job control or control over work in research related to occupation health. Several theories related to occupational health and performance, such as the job demand-control model, job characteristics model and self-determination theory, state that job control is one of the most important factors for employees' physical and psychological well-being, motivation and performance. Job control is the most consistently discussed factor in research studies related to occupational health psychology[2–7)]. It has also been reported to help buffer the detrimental effects of high work demands on employees' psychological well-being. However, there is a significant variation in the various cross-sectional, experimental, and longitudinal studies concerning job control on employee

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well-being[2, 8]. On the other hand, it has also been that reported high control or an increase in job control can impair the well-being of employees due to the burden of increased autonomy and self-management[9, 10].

Karasek defined job control as "*the control of an individual over the work process*, *work environment*, *and other decisions related to their work*"[11]. There are two main dimensions of job control, Control-Over-Work (CoW) and Control-Over-Work-Time (CoT). The CoW can be defined as "an employee's control over the amount, method and order of work". CoT can be defined as "an employee's control over the duration and distribution of work time". These two dimensions of job control have different associations with the psychological well-being of employees. Several studies have used job control to predict psychological and physical stress outcomes such as distress, anxiety, neck and back pain, insomnia, and cardiovascular mortality[12–16]. However, the findings of these studies suggest the varied effects of job control on different outcomes related to employee well-being. Also, the effect of job control on psychological well-being is different for different kinds of work environments over different geographical locations[2]. Most of the studies focus on employees from European countries and North America. These results cannot be generalised to south Asian countries such as India because of the difference in health, economic, and social systems. Also, there is a difference in the organisational structure and culture, and thus job control can be associated very differently with psychological well-being in Indian employees.

In an organisation, employees at different hierarchies also have different levels of job control. The relationship between job control and psychological stress changes at each level within the organisation itself. While the control at the top management is highest, it reduces as hierarchies of the organisation go down. Middle-Level Managers (MLMs) are in an important position to create the link between top management and the lower-level employees in an organisation in implementing organisational strategies[17–19]. They need to interpret strategic decisions in the context of operations and communicate with their subordinates for its implementations[20]. However, the job control that MLMs have is very different from the job control at lower levels because job control at the managerial level is associated with increased decision making, which sometimes results in increased workload. So, the relationship between job control and psychological well-being in MLMs could be very different from the general perspective that high job control is associated with better psychological well-being. For example, MLMs have control over the implementation of organisational policies and changes with no control over those policies themselves. So, this kind of situation puts them in high strain situations at the workplace[21]. Murphy and Pepper reported that managers responsible for delivering layoff notices and those involved in direct and indirect downsizing experienced a significant increase in health problems such as headaches, high blood pressure, depression, and job insecurity[22]. A high level of psychological stress in employees in managerial positions has been reported in several studies[17, 18].

The prevalence of psychological stress and its association with several organisational factors in managers have been explored in various studies[23–26]. Association of working hours and psychological stress have also been studied in managers under different occupational settings[23, 26]. However, there is limited research related to the effect of control over working hours and working days on the psychological well-being of MLMs. Also, there is a limited study of such factors on psychological well-being in MLMs in telecommunication. Also, this research gap widens more significantly in the case of the Indian perspective. In the present study, an effort has been made aims to analyse the effect of job control on psychological stress for Indian MLMs working in a public telecommunication organisation.

The objective of the present work is to find the relationship between job control and self-reported psychological stress at the workplace for employees working in middle management of an Indian public organisation. It was hypothesised that:

1. there is a significant effect of control over work on psychological stress,
2. there is a significant effect of control over working hours on psychological stress, and
3. there is a significant effect of control over working days on psychological stress.

Subjects and Methods

The following sections describe the materials and methods used in this cross-sectional study.

Data collection

The data for the study were collected during a short-term course organised for a public Indian telecom organisation. A self-reported questionnaire was used for this purpose. Ten Events Per Variable (EPV) is a widely advocated minimal criterion for sample size considerations

for logistic regression analysis. There have been studies questioning the relevance of the EPV >10 rule. Some of the researchers suggested a method of a minimum 100 sample size for eight independent variables, others suggested an EPV >20[27]. This study uses the latter approach and the minimum sample size is 200 for ten variables. Two- hundred-fifty eligible people were approached out of which 210 responded making the response rate 84%. The sampling method used for the study is judgmental sampling. All the participants were informed about the scope of the study and were asked to fill out the questionnaire. The responses to the questionnaire were kept anonymous. Respondents voluntarily agreed to participate in the survey. Informed consent was obtained from all the participants. Ethical approval of the study was obtained from the Research Project Evaluation Committee (RPEC).

Measurement of the variables

The questionnaire used for the data collection measured gender, age, experience in the organisation with the current position, job control and psychological stress. Three dimensions of job control were measured: 1) Control-Over-Work (CoW), 2) Control-Over-Working-Hours (CoT1), and 3) Control-Over-Working-Days (CoT2).

The sub-dimensions of CoW were 1) deciding the amount of work assigned, 2) choosing methods to complete the work, 3) deciding whom to work with, 4) deciding the order of tasks, and 5) deciding when to start and end the project/task. The sub-dimensions of CoT1 include the starting and ending times of the workday and breaks during work. CoT2 included control over days off or holidays. Both dimensions of job control over work time were measured using a single question. The questions were scored on a five-point Likert scale varying from zero to four.

The modified Copenhagen Psychosocial Questionnaire (COPSOQ) measured psychological stress[28]. The psychological stress questionnaire was divided into behavioural stress, somatic stress, and cognitive stress. The questions were also scored on a five-point Likert scale varying from zero to four.

The exploratory Factor Analysis (EFA) was used to measure the construct validity of the questionnaire. Factor loadings were obtained for questionnaire items using the maximum likelihood method and varimax rotation for job control, behavioural, somatic and cognitive stress. The analysis was performed using IBM SPSS, 21.0. The results of the same are shown in Table 1[29]. BS1, BS2, BS3, BS4 and BS5 are individual items of the behavioural stress questionnaire. Similarly, somatic, cognitive stress and control over work have their items.

A factor loading value above 0.45 suggests that the item loads sufficiently on the respective factor[30]. It is clear from Table 1 that all items of behavioural stress, somatic stress, cognitive stress and CoW load significantly on their respective factors and thus validate the construct of the questionnaire.

After the validity, the reliability of the questionnaire was tested using Cronbach's α test. Results of the same are shown in Table 1. Nunnally suggested that the questionnaire be reliable for Cronbach's α greater than 0.7[31]. Since α values for the CoW, behavioural stress, somatic stress, and cognitive stress are above 0.7, the questionnaire is found to be reliable.

The job control dimensions were dichotomised to create the high and low categories of job controls at the next step. For CoW, a scale was created by adding the responses of the items that load on this dimension. Using 60–40 as cut-off dichtomisation in the high and low control group was done. CoT1 and CoT2 were also dichotomised using a similar method.

The behavioural, somatic and cognitive stress were composed of five, seven and four items respectively. The score was calculated by the sum of the score on each item. The score for behavioural stress ranged from 0 to 20. The score for somatic and cognitive stress ranged from 0 to 28 and 0 to 16 respectively. Behavioural stress was then classified as no stress (0–7) and stress (8–20). Similarly, somatic stress was classified as no stress (0–10) and stress (11–28) and cognitive stress as no stress (0–5) and stress (6–16).

The socio-demographic variables age, gender, experience in the organisation and current position were included as control variables because they can confound the relationship between job control dimensions and outcome variables behavioural, somatic and cognitive stress.

Data analysis

The descriptive statistics for all independent and dependent variables were calculated. The analysis was performed using IBM SPSS. The frequency distribution for the socio-demographic characteristics of the sample population is given in Table 2.

Figure 1 shows the distribution of the study population in high and low control groups of job control dimensions.

Methods

After descriptive analysis, Binary Logistics Regression

Table 1. Factor loading and Cronbach's α: psychological stress and control over work

	Factor loading			
	Factor 1	Factor 2	Factor 3	Factor 4
	Somatic stress (SS)	Behavioural stress (BS)	Cognitive stress (CS)	Control over work (CoW)
Behavioural stress items				
BS1	0.114	**0.866**	0.101	−0.136
BS2	0.082	**0.761**	0.133	−0.018
BS3	0.179	**0.662**	0.059	0.011
BS4	0.174	**0.682**	0.14	−0.090
BS5	0.090	**0.643**	0.291	−0.153
Somatic stress items				
SS1	**0.586**	−0.006	0.259	−0.038
SS2	**0.817**	0.146	0.106	−0.107
SS3	**0.756**	0.123	0	−0.137
SS4	**0.735**	0.094	0.065	−0.034
SS5	**0.779**	0.101	0.065	−0.136
SS6	**0.651**	0.082	0.228	−0.045
SS7	**0.614**	0.077	0.095	0.048
Cognitive stress items				
CS1	0.224	0.207	**0.625**	−0.196
CS2	0.107	0.189	**0.758**	−0.080
CS3	0.171	0.056	**0.761**	−0.051
CS4	0.100	0.114	**0.625**	−0.152
Control over work items				
JC1	−0.035	−0.041	−0.061	**0.540**
JC2	−0.073	−0.124	−0.059	**0.634**
JC3	−0.069	−0.008	−0.096	**0.486**
JC4	−0.008	−0.018	−0.041	**0.519**
JC5	−0.055	−0.030	−0.081	**0.486**
Cronbach's α	0.858	0.834	0.859	**0.735**

Significant factor loading represented in bold.

(BLR) was performed to find the association between job control dimensions and behavioural, somatic and cognitive stress, controlling for the variables age, gender, experience in the organisation and experience in current position.

BLR is an extension of linear regression. It is used when the dependent variable is dichotomous, i.e. yes/no type; however, the two categories can be anything such as "reported stress vs. did not report stress" or "pass vs. fail". The independent variables can be dichotomous, ordinal or continuous. BLR is used to understand the relationship between dependent and independent variables and find appropriate statistical conclusions. Apart from assessing how independent variables predict the categorical dependent variable and determining the model's goodness of fit, it also provides the model's accuracy by determining the percent of correct predictions made using the model[32].

In BLR, a non-adjusted model has one independent variable, i.e. no other covariates are introduced in the model. The adjusted model has more than one independent variable in the model.

BLR also provides an Odds Ratio (OR) for adjusted and non-adjusted models. An OR is a statistic that quantifies the strength of the relationship between two events, X and Y. The OR is defined as the ratio of the odds of X in the presence of Y and the odds of X in the absence of Y. If the OR is greater than 1, then X and Y are associated in the sense that, compared to the absence of Y, the presence of Y raises the odds of X, and symmetrically presence of X raises the odds of Y[33]. An odds ratio is known as crude odds ratio (Crude OR) in the case of a non-adjusted model and adjusted odds ratio (Adjusted OR) in the adjusted model.

For the present study, χ^2 goodness-of-fit and Hosmer–Lemeshow goodness-of-fit test are used to assess the

model's fit for BLR. Crude and adjusted odds ratio (OR) with a 95% confidence interval were also calculated.

Results

Figure 2 shows the prevalence of behavioural, somatic and cognitive stress in high and low control groups of work, working hours and working days in terms of percentage. It appears that the prevalence of behavioural, somatic and cognitive stress is more in employees in low control groups for CoW and CoT2. However, in the case of CoT1 prevalence of psychological stress is more in the high control group.

Table 2. Socio-demographic characteristics and prevalence of psychological stress

	N=210
Age (yr)	
30–40	18 (8%)
41–50	117 (56%)
51+	75 (36%)
Gender	
Male	191 (91%)
Female	19 (9%)
Experience in organisation	
10–20	88
21–30	101
31+	21
Experience in current position	
0–2	66
3–5	71
5–10	49
10+	24
Point prevalence of behavioural, somatic and cognitive stress	
Behavioural stress	52 (25%)
Somatic stress	30 (14%)
Cognitive stress	93 (44%)

In Tables 3, 4, and 5, job control (CoW, CoT1, CoT2), gender, age, experience in organisation and the current position were included in the analysis, which was performed separately for behavioural, somatic and cognitive stress. Crude and adjusted OR, including 95% confidence interval from BLR for behavioural, somatic and cognitive stress, are reported.

The Hosmer–Lemeshow goodness of fit test showed a good BLR model fit for all three behavioural, somatic, and cognitive stress models. The values of chi-square were small and non-significant for behavioural stress (χ^2=7.7, p=0.35) and significant for somatic (χ^2=23.4, p=0.001) and cognitive stress (χ^2=27.0, p=0.000).

The BLR model for behavioural stress has shown 5.4% of the variance in behavioural stress and correctly classified 74.8% of cases, i.e., the accuracy. Similarly, somatic and cognitive stress models explained 18.8% and 16.2% of

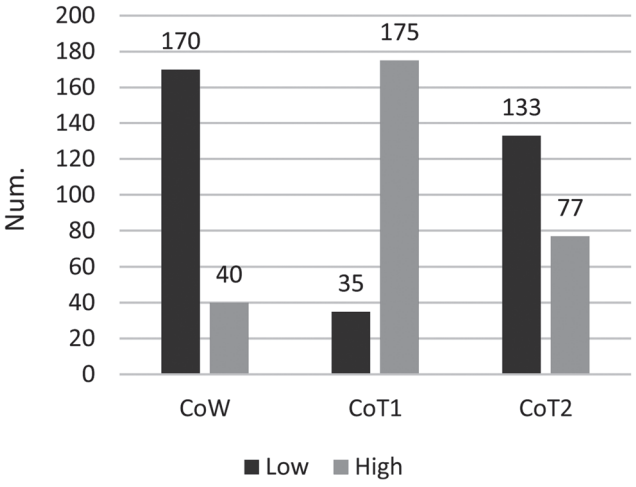

Fig. 1. Distribution of Middle-Level Managers (MLMs) in high and low control groups.
CoW: control over work; CoT1: control over working time; CoT2: control over working days.

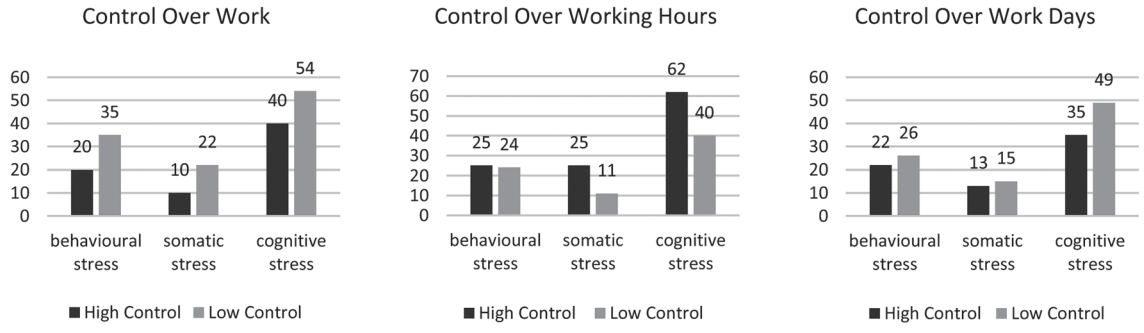

Fig. 2. Prevalence of behavioural, somatic and cognitive stress in high and low control groups.

Table 3. Non adjusted and adjusted OR for behavioural stress

	Number of subjects	Crude OR (95%)	Adjusted OR[a] (95%)
Gender			
Male	191	0.4 (0.1–10.3)	0.4 (0.1–10.3)
Female	19		
Age	210	0.9 (0.9–10.0)	1.0 (0.9–1.1)
Experience in organisation	210	0.9 (0.9–1.0)	0.9 (0.8–1.0)
Experience in current position	210	0.9 (0.9–1.0)	0.9 (0.9–1.0)
Control over work			
Low	170	2.0 (1.0–4.0)*	1.9 (0.9–3.8)
High	40		
Control over working hours			
Low	35	0.9 (0.4–2.1)	0.9 (0.9–2.0)
High	175		
Control over working days			
Low	133	10.2 (0.6–2.4)	1.2 (0.6–2.4)
High	77		

*$p<0.05$ (significant factor).

OR: odds ratio.

[a]Adjusted for all the variables included in the model.

Table 4. Non adjusted and adjusted OR for somatic stress

	Number of subjects	Crude OR (95%)	Adjusted OR[a] (95%)
Gender			
Male	191	0.5 (0.1–1.7)	0.2 (0.0–1.0)
Female	19		
Age	210	0.8 (0.8–0.9)*	1.0 (0.8–1.1)
Experience in organisation	210	0.8 (0.8–0.9)*	0.8 (0.7–0.9)*
Experience in current position	210	1.0 (0.9–1.1)	1.0 (0.9–1.1)
Control over work			
Low	170	2.3 (1.0–5.1)*	2.2 (0.9–5.3)
High	40		
Control over working hours			
Low	35	0.4 (0.1–0.9)*	0.3 (0.1–0.9)*
High	175		
Control over working days			
Low	133	1.1 (0.5–2.6)	1.3 (0.5–3.2)
High	77		

*$p<0.05$ (significant factor).

OR: odds ratio.

[a]Adjusted for all the variables included in the model.

the variance in somatic and cognitive stress, respectively and correctly classified 84.8% and 64.8% cases.

It can be seen from Table 3 that for the behavioural stress model, none of the variables in the model was significantly associated with behavioural stress. However, when considered independently, CoW was significantly associated with behavioural stress but no other independent variables.

Table 4 shows that experience in the organisation and CoT1 had a significant relationship with somatic stress for the somatic stress model. However, age and CoW also showed a significant association with somatic stress when considered independently.

Table 5 shows the results of the BLR model for cogni-

Table 5. Non adjusted and adjusted OR for cognitive stress

	Number of subjects	Crude OR (95%)	Adjusted OR[a] (95%)
Gender			
Male	191	1.6 (0.5–4.5)	1.1 (0.3–3.3)
Female	19		
Age	210	0.9 (0.8–1.0)*	1.0 (0.9–1.1)
Experience in organisation	210	0.9 (0.8–0.9)*	0.8 (0.8–0.9)
Experience in current position	210	1.0 (0.9–1.0)	1.0 (0.9–1.0)
Control over work			
Low	170	1.7 (0.9–3.1)	1.7 (0.9–3.3)
High	40		
Control over working hours			
Low	35	0.4 (0.1–0.8)*	0.3 (0.1–0.8)*
High	175		
Control over working days			
Low	133	1.8 (0.9–3.4)*	1.8 (0.9–3.4)*
High	77		

*$p<0.05$ (significant factor).

OR: odds ratio.

[a]Adjusted for all the variables included in the model.

tive stress. It can be seen from Table 5 that CoT1 and CoT2 were significantly associated with cognitive stress. Age and experience in the organisation were also significantly associated with somatic stress When considered independently.

It can be noted that consistent with our hypothesis, low control over working days significantly increases the risk of developing cognitive stress but not behavioural and somatic stress. However, in the case of CoT1, high control increases the risk of developing somatic and cognitive stress but no behavioural stress. CoT2 does not predict any of the considered psychological stress.

Discussion

The present study aimed to analyse the association between job control and psychological well-being in the middle-level managers of an Indian public telecom organisation. Three dimensions of job control: Control-Over-Work (CoW), Control-Over-Working-Hours (CoT1) and Control-Over-Working-Days (CoT2), were included in the study. The output variables of the study were behavioural, somatic and cognitive stress.

The reported prevalence of behavioural, somatic and cognitive stress is 25%, 14% and 44%. 56% of employees reported psychological stress. It suggests that more than half of the employees have psychological well-being issues. Cognitive stress is the most frequently reported problem among middle-level managers. More employees from low control groups in the case of CoW and CoT2 reported psychological stress. However, in the case of CoT1, more employees from the high control group reported psychological stress. A few previous studies also reported similar results suggesting that high control or increase in job control can negatively impact well-being, which is the opposite of the general perception of how job control affects well-being[9, 10]. However, the present study differentiates the CoW and CoT, providing a better understanding of how different types of control at the workplace affect psychological well-being. Hambrick *et al.* reported that managers have higher control over work than employees in lower positions but not over time[21]. Managers are often the people who work overtime and longer hours[21]. However, the results of the present study are not similar as 70% of MLMs from the study reported low CoW. However, 19% MLMs reported low CoT1, and 63% reported low CoT2, respectively, suggesting that CoW and CoT2 are low in the organisation, but CoT1 is high.

Behavioural stress had no significant relationship with any of the control dimensions when controlling variables are age, gender and experience. However, when only CoW was considered, it significantly affected behavioural stress (Table 4). It is found that the adjusted OR for the CoW is 1.9 (0.9–3.8) (Table 4) in the behavioural stress model, suggesting that managers in the low CoW group have almost twice the risk of having behavioural stress than

managers in the high control group. This is very similar to the already established theory of the JDC model that people in the high control group have less psychological stress than low control groups. However, the previous research focused on job control and did not consider the effect of different dimensions of job control differently as the present study[34–37]. Even though the result suggests a significant effect of one dimension of job control on behavioural stress, the remaining two dimensions did not significantly correlate with behavioural stress. Although gender had no significant effect on behavioural stress, the adjusted OR (0.4 (0.1–1.3)) as shown in Table 4 suggested that female managers have a 60% higher chance of having behavioural stress than males.

The adjusted model for somatic stress showed a significant effect of CoT1 and experience in the organisation on somatic stress. For the non-adjusted model, age, and experience in the organisation, CoW and CoT1 were significantly associated with somatic stress (Table 5). The adjusted OR for the CoW is 2.2 (0.9–5.3) (Table 5), suggesting that managers in the low CoW group have 2.2 times more chances of having somatic stress than managers in the high control group. The adjusted OR for CoT1 is 0.3 (0.1–0.9) (Table 5), show that managers with low CoT1 have 30% less chances of having somatic stress than those with high CoT1. De Jonge *et al.*[9] and van Vegchel *et al.*[10] reported similar results, suggesting that high control negatively impacts psychological well-being. However, the present findings emphasise that MLMs' CoT1 increases the risk of having somatic stress.

CoT1 and CoT2 had a significant relationship with cognitive stress in the adjusted model. Age and experience in the organisation also had a significant relationship with cognitive stress in the non-adjusted model. The adjusted OR for CoT1 is 0.3 (0.1–0.8) report that the low control group has 30% less chances of having cognitive stress than the high control group. It can also be seen that the adjusted OR for CoT2 is 1.8 (0.9–3.4), which means that the low control group has 1.8 times more chances of having cognitive stress than the high control group. Although CoW is not significantly related to cognitive stress, adjusted OR (1.7 (0.9–3.3)) suggests that managers with low CoW have 1.7 times more chance of having cognitive stress than managers with high control over work.

Overall results of the study suggest that MLMs with low CoW and CoT2 have more chances of having psychological stress. These two dimensions of job control relate to psychological well-being with the already established perceptions of the effect of job control on health. However, the MLMs with high CoT1 have more psychological stress. This finding differs from the results of the work flexibility that organisations tend to achieve by providing greater control to employees in terms of work and time. More focus should be given to every dimension of work control and how it can affect employees' psychological and physical well-being. Providing employees with the control that can make them feel more overwhelmed or increase the burden on them due to an increment in decision making can reverse the positive effects of job control and lead to poor psychological health. Also, the control at the workplace is a function of employees' position in the organisational hierarchy. Several previous studies have reported that CoT reduces stress in workers[26, 27]; however, this relationship is the opposite for MLMs. So, control at the workplace can also affect an employee positively or negatively based on his position in the organisational hierarchy. Thus, equal importance should be given to this aspect when providing control at the workplace.

In the present work, the effect of control over work, working hours and working days on behavioural, somatic and cognitive stress showed that control at the workplace is an important factor in predicting the psychological well-being of the employees. Indeed control at work and working days are negatively associated with psychological stress. These findings emphasise the importance of work flexibility for the well-being of employees, especially in modern times when occupational stress is a growing concern all around the world. Also, the findings suggest a positive association between control at working hours and psychological stress indicating that autonomy and increased decision making can be taxing and induce an unnecessary burden on employees. In general, the current findings represent that psychological stress can be strongly influenced by control in the workplace. Organisational policies and structures that provide control which is not overwhelming for employees can improve employee well-being.

The limitation of the present work is that it only focuses on the effect of three dimensions of job control on the psychological well-being of Indian MLMs. Future work can incorporate more work-related and individual factors in the present model. Intervention studies to support the present study results can also be done as future work. Similar kinds of studies can also be extended to see the effect of the pandemic on such findings and the current trend in the industry in general.

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