Chapter 4
EFFECT OF JOB CONTROL DIMENSIONS ON PSYCHOLOGICAL STRESS

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 on 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 (Davidescu et al., 2020; Singh et al., 2022). The recent pandemic due to Covid 19 has reinforced this trend (Gashi et al., 2021). 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 (Van der Doef and Maes, 1999; De Jonge and Dormann, 2003; Warr, 2003; Fila et al., 2017; Wemken et al., 2021; Sommovigo et al., 2021; Singh et al., 2022). It has also been reported that job control can be used to buffer the detrimental effects of high work demands on employees' psychological well-being. However, there is a significant variation in the effect of job control on employee well-being in the various cross-sectional, experimental, and longitudinal studies conducted by various researchers (Van der Doef and Maes, 1999; Häussr et al., 2010; Singh et al., 2022). On the other hand, it has also been reported that 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 (De Jong et al., 2000; Vegchel et al., 2004).

Karasek (1979) defined job control as "*the control of an individual over the work process*, *work environment*, *and other decisions related to their work*". In this current work, two main dimensions of job control are visualised as 1) Control-Over-Work (CoW) and 2) Control-Over-Work-Time (CoT). The CoW can be defined as an employee's control over 1. the amount, 2. Method and 3. order of the work. CoT can be defined as an employee's control over 1. the duration and 2. distribution of work time. “Control Over Working Hours” (CoT1) and “Control Over Working Days” (CoT2) have been considered two dimensions of CoT. These two dimensions of job control have different associations with the psychological well-being of employees. Several studies have used “control over work” to predict psychological and physical stress outcomes such as distress, anxiety, neck and back pain, insomnia, and cardiovascular mortality (Kristensen, 1996; Rafferty et al., 2001; Nomura et al., 2009; Pinto et al., 2014; Afshari et al., 2021; Singh et al., 2022). The findings of these studies suggest the varied effects of “control over work” on different outcomes related to employee well-being, as shown in Table 1.2. Association of working hours and psychological stress have also been studied in managers in different occupations. However, there is limited research related to the effect of “control over working hours” and working days on the psychological well-being of MLMs (Rahim, 1996; Hobson and Beach, 2000; Kirkcaldy et al., 2000; Lu et al., 2005; Singh et al., 2022).

In order to understand the relationship between the dimensions of job control and self-reported psychological stress at the workplace for employees especially working at the middle level of management in an Indian public organisation, the following hypotheses have been considered and checked.

H1: There is a significant effect of "Control Over Work" (CoW) on psychological stress.

H2: There is a significant effect of "Control Over Working Hours" (CoT1) on psychological stress.

H3: There is a significant effect of "Control Over Working Days" (CoT2) on psychological stress.

The following section describes the approach used to analyse such effects.

4.1. METHODS

For the present work, Binary Logistics Regression (BLR) was used to find the association between job control dimensions and 1(a) behavioural, 1(b) somatic, and 1(c) cognitive stress, 2. controlling variables 2(a) age, 2(b) gender, 2(c) experience in the organisation and 2(d) experience in the current position. The socio-demographic variables age, gender, experience in the organisation and current position were included in BLR as control variables because they can confound the relationship between job control dimensions and outcome variables, i.e., behavioural, somatic and cognitive stress (Singh et al., 2022).

BLR is an extension of linear regression. It is used when the dependent variable is dichotomous, i.e., yes or no type, e.g., "reported stress Vs no reported stress" or "pass Vs fail", etc. 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 affect the categorical dependent variables and determining the model's goodness of fit, it also provides the model's accuracy by determining the percentage of correct predictions made using the classification table (Fritz and Berger, 2015; Singh et al., 2022).

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 (Singh et al., 2022).

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, for example, 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 the presence of Y raises the odds of X, as compared to the absence of Y, and symmetrically presence of X raises the odds of Y (Szumilas, 2010; Singh et al., 2022). 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 (Singh et al., 2022).

Table 4.1 shows the results of BLR with the outcome variable as stress, input variable as "control over working hours", and control variable as gender. There are three columns of the results. The column with the heading "number of subjects" shows the number of cases in each category. So, the values 191 and 19 in column "number of subjects" shows that there are 191 males and 19 females. Similarly, in the section "control over working days", value 133 and 77 shows that there are 133 people in the low control group and 77 people in the high control group. The other two columns show the value of crude and adjusted OR ratio and the confidence intervals. For example, in Table 4.1, a value of 1.2 for OR shows that people in the low "control over working days" group have 1.2 times the stress in comparison to people in the high control groups.

So, the job control dimensions were first dichotomised to create the high and low categories of job controls to use BLR. For CoW, a scale was created by adding the responses of the items that load on this dimension.

Table 4.1: Example of results of BLR

	Number of subjects	Crude OR (95%)	Adjusted OR[a] (95%)
Gender			
Male	191	0.4 (0.1-1.3)	0.4 (0.1-1.3)
Female	19		
Control over working days			
Low	133	1.2 (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.

Using 60-40 as cut-off, dichotomisation in the high and low control category was done to create the groups. CoT1 and CoT2 were also dichotomised using a similar method. Table 4.2 shows the range of scores for high and low control for CoW, CoT1 and CoT2. The behavioural, somatic and cognitive stress were composed of five, seven and four items, respectively, in the questionnaire (Table 2.8). The score was calculated by summing the score on each item. These scores were used to dichotomise such variables in the groups of stress and no stress category.

Table 4.2: Dichotomised values for control dimensions, and psychological stress

Control dimensions	**Low**	**High**
Control over work (CoW)	0-8	9-20
Control over working hours (CoT1)	0-2	3-4
Control over working days (CoT2)	0-2	3-4
Psychological stress	**No stress**	**Stress**
Behavioural stress	0-7	8-20
Somatic stress	0-10	11-28
Cognitive stress	0-5	6-16

The score for behavioural stress ranged from 0 to 20. The somatic and cognitive stress scores ranged from 0 to 28 and 0 to 16, respectively. These scores are then used to dichotomise behavioural, somatic and cognitive stress in stress and no stress groups. Table 4.1 shows the range of scores for stress and no stress for behavioural, somatic and cognitive stress. Table 4.2 clearly shows that behavioural stress was classified as no stress when values range from 0 to 7 and stress from 8 to 20. Similarly, somatic stress was

classified as no stress with values ranging from 0 to 10 and stress from 11 to 28 and cognitive stress as no stress with values ranging from 0 to 5 and stress from 6 to 16.

4.2. DATA ANALYSIS

The descriptive statistics for all independent and dependent variables were calculated. The analysis was performed using IBM SPSS Version 21.0. The frequency distribution for the socio-demographic characteristics of the sample population is given in Table 4.3.

Table 4.3: Socio-demographic characteristics and prevalence of psychological stress

	N = 210
Age	
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%)

Table 4.3 clearly shows that majority of surveyed managers are of the age more than 41 years. The sample population consists of 91% male population, so the results of the study would be more suitable for the male gender only. The majority of MLMs have experience in the organisation ranging from 10 to 30 years. While experience in the

current position is mostly in the range of 1 to 10 years. Table 4.3 also shows that cognitive is the most reported psychological stress, followed by behavioural and somatic stress.

Figure 4.1 shows the distribution of the study population in high and low control groups of job control dimensions. Figure 4.1 shows that "control over work" (CoW) and "control over working days" (CoT2) are low in the MLMs in the case organisation. While "control over working hours" (CoT1) is high.

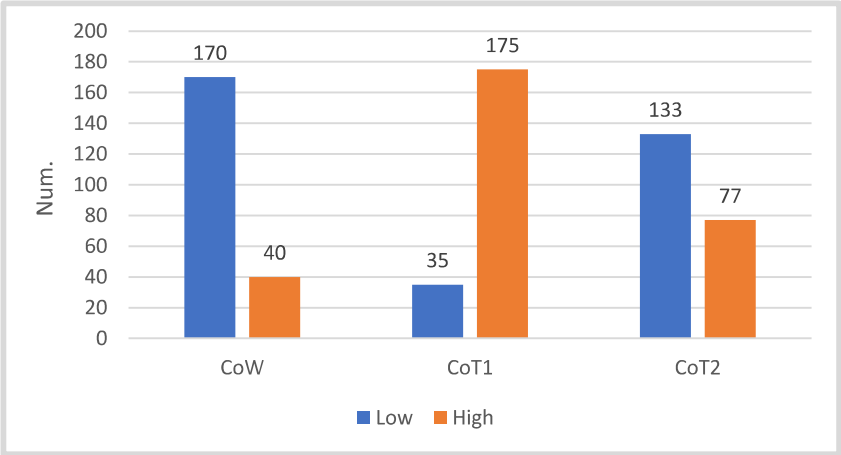

Figure 4.1: Distribution of MLMs in high and low control groups

Using this data, various BLR models were developed to study the effect of input and control variables on the output variables. A goodness of fit was first checked. For this purpose, chi-square value and Hosmer-Lemeshow goodness-of-fit tests were used to assess the model's fit for BLR. Crude and adjusted odds ratio (OR) with a 95% confidence interval was calculated to see how groups are different from each other for each output variable.

4.3. RESULTS

Figure 4.2 shows the prevalence of behavioural, somatic and cognitive stress in high and low control groups of work (CoW), working hours (CoT1) and working days (CoT2) in terms of percentage. It appears that the prevalence of behavioural, somatic and cognitive stress was more in employees in low control groups for CoW and CoT2.

However, in the case of CoT1 prevalence of psychological stress was more in the high control group.

Dimensions of job control (CoW, CoT1, CoT2), gender, age, experience in the 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 a 95% confidence interval from BLR for behavioural, somatic and cognitive stress, were determined.

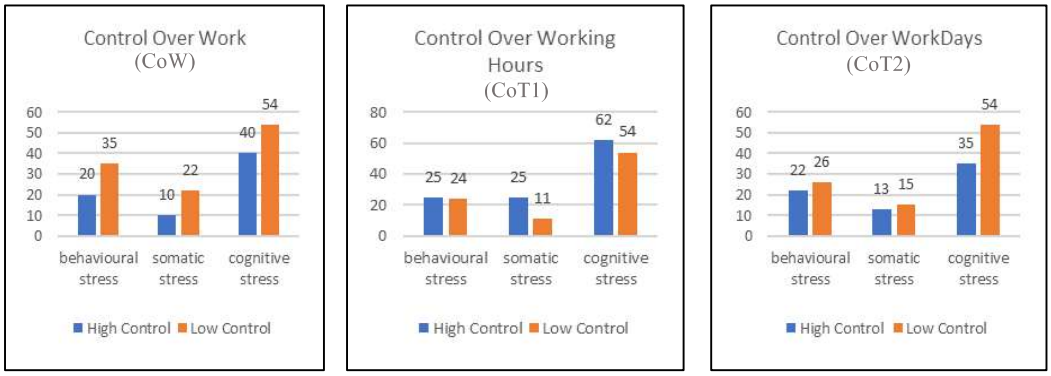

Figure 4.2: Percentage prevalence of behavioural, somatic and cognitive stress in high and low control groups

Hosmer-Lemeshow goodness of fit test showed a good fit of the BLR model for all three cases of behavioural, somatic, and cognitive stress. Chi-square, Hosmer-Lemeshow goodness of fit value, variance explained by the models and accuracy of the models are shown in Table 4.4.

Table 4.4: Goodness of fit, variance and accuracy of BLR models

BLR model	**Chi-square value**	**Significant value**	**Variance (%)**	**Accuracy (%)**
Behavioural stress model	9.26	0.321	5.4	74.8
Somatic stress model	6.22	0.622	18.8	84.8
Cognitive stress model	7.07	0.528	16.2	64.8

Table 4.4 shows that the chi-square values were small, and the Hosmer-Lemeshow goodness of fit test was non-significant for behavioural, somatic and cognitive stress, suggesting a good fit of all three models. The BLR model for behavioural stress

correctly classified 74.8% of cases, i.e., the accuracy. Similarly, somatic and cognitive stress correctly classified 84.8% and 64.8% of cases.

The following three subsections show the results of BLR for three types of stresses.

4.3.1. BLR model for behavioural stress

Table 4.5 shows the adjusted and crude OR values for behavioural stress. It can be seen from Table 4.5 that none of the variables in the model was significantly associated with behavioural stress in the BLR model.

Table 4.5: Non-adjusted and adjusted OR for behavioural stress

	Number of subjects	Crude OR (95%)	Adjusted OR[a] (95%)
Gender			
Male	191	0.4 (0.1-1.3)	0.4 (0.1-1.3)
Female	19		
Age	210	0.9 (0.9-1.0)	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 (CoW)			
Low	170	2.0 (1.0-4.0)*	1.9 (0.9-3.8)
High	40		
Control over working hours (CoT1)			
Low	35	0.9 (0.4-2.1)	0.9 (0.9-2.0)
High	175		
Control over working days (CoT2)			
Low	133	1.2 (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.

The adjusted OR for the CoW was 1.9 (0.9-3.8) (Table 4.5) for behavioural stress. It suggests that managers in the low CoW group had almost twice the risk of having behavioural stress compared to those 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 had less psychological stress than low control groups. However, the previous research (Amick and Celentano, 1991; Chiang et al., 2010; Ramadoss, 2012; Preston, 2018) focused on job control and did not consider the different dimensions of job control as was done in

this study. 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 4.5, suggested that female managers had a 60% higher chance of having behavioural stress than males.

4.3.2. BLR Model for somatic stress

Table 4.6 shows the crude and adjusted OR for the somatic stress. It can be seen from Table 4.6 that experience in the organisation and CoT1 had a significant relationship with somatic stress. However, age and CoW also showed a significant association with somatic stress only when considered independently.

Table 4.6: 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 (CoW)			
Low	170	2.3 (1.0-5.1)*	2.2 (0.9-5.3)
High	40		
Control over working hours (CoT1)			
Low	35	0.4 (0.1-0.9)*	0.3 (0.1-0.9)*
High	175		
Control over working days (CoT2)			
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 adjusted OR for the CoW was 2.2 (0.9-5.3) (Table 4.6). It explains that managers in the low CoW group had 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 4.6), which showed that managers with low CoT1 had 30% fewer chances of having somatic stress than those with high CoT1. De Jonge et al. (2000) and Vegchel et al. (2004) 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.

4.3.3. BLR model for cognitive stress

Table 4.7 presents the results of the BLR model for cognitive stress. It can be seen from Table 4.7 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.

Table 4.7: 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 (CoW)			
Low	170	1.7 (0.9-3.1)	1.7 (0.9-3.3)
High	40		
Control over working hours (CoT1)			
Low	35	0.4 (0.1-0.8)*	0.3 (0.1-0.8)*
High	175		
Control over working days (CoT2)			
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.

The adjusted OR for CoT1 was 0.3 (0.1-0.8) (Table 4.7), which showed that the low control group had 30% fewer chances of having cognitive stress than the high control group.

It can also be seen from Table 4.7 that the adjusted OR for CoT2 was 1.8 (0.9-3.4), which means that the low control group had 1.8 times more chances of having cognitive stress than the high control group. Although CoW was not significantly related to cognitive stress, adjusted OR (1.7 (0.9-3.3)) suggested that managers with low CoW had 1.7 times more chance of having cognitive stress than managers with high "control over work".

4.4. CONCLUSION

The association between job control and psychological well-being in the middle-level managers of an Indian public telecom organisation was analysed through Binary Logistic Regression. Three dimensions of job control 1) Control-Over-Work (CoW), 2) Control-Over-Working-Hours (CoT1) and 3) Control-Over-Working-Days (CoT2), were included in the study. Age, gender, experience in the organization, and experience at the current position were considered control variables in the model. The output variables of the study were behavioural, somatic and cognitive stress.

Psychological stress was reported by 56% of employees. Out of the surveyed cases, the prevalence of behavioural, somatic and cognitive stress was 25%, 14% and 44%, respectively. It suggests that more than half of the employees had psychological well-being issues. Cognitive stress was 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 (De Jonge, 2000; Vegchel, 2004; Singh et al., 2022). However, the present study differentiates the CoW and CoT by 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 (Hambrick, 2005; Singh et al., 2022). Most managers work overtime and longer hours (Hambrick, 2005). However, the results of the present study were not similar as 70% of MLMs from the study reported low CoW, 19% MLMs reported low CoT1, and 63% reported low CoT2. It shows that “control over work” and “control over working days” were low in the organisation, but “control over working hours” was high.

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 had 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. Several previous studies have reported that CoT reduces stress in workers (Kirkcaldy et al., 2000; van Smeden et al., 2016; Singh et al., 2022); however, this relationship is the opposite for MLMs in this study. So, control at the workplace can affect an employee positively or negatively.

In the present work, the effect of “control over work”, “control over working hours”, and “control over 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 over work” and “control over 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 over 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 control in the workplace can strongly influence psychological stress. Organisational policies and structures that provide control which is not overwhelming for employees can improve employee well-being.