



# Development and Validation of a Model for Predicting Productivity Based on Psychosocial Factors in Administrative Staff; The Mediating Role of Physical and Mental Health



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## ABSTRACT

**Aims** This study aimed to develop and validate a model for predicting productivity in university administrative staff.

**Instrument & Methods** In this cross-sectional study, 614 participants completed a survey that included the Job Stress Questionnaire, Job Security Scale, Role Clarity Scale, Distributive Justice Subscale, Procedural Justice Subscale, Job Content Subscale, Physical Health Questionnaire, Depression, Anxiety, and Stress Scale, and Stanford Presenteeism Scale. To validate the proposed model, structural equation modeling was conducted using SPSS 23 and AMOS 23 software.

**Findings** Distributive justice, job content, and procedural justice had the greatest direct impact on employee productivity. Additionally, workload, colleague support, management support, role clarity, and procedural justice were found to have significant positive relationships with mental health. Workload, management support, and job content also showed significant positive relationships with physical health, and both mental health and physical health positively predicted presenteeism. The findings revealed a mediating pathway in the relationship between mental health, physical health, and productivity. The data further suggested that mental health has a substantial impact on physical health. Moreover, mental health was found to mediate the relationship between job stressors and presenteeism through its effect on physical health.

**Conclusion** Psychosocial factors, including distributive justice, job content, and procedural justice, have the greatest impact on employee productivity.

**Keywords** Mental Health; Workload; Presenteeism; Work Performance

## CITATION LINKS

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## Introduction

Productivity is commonly regarded as an objective economic concept that refers to output per unit of input. The productivity of an organization is a determinant of wages, prices, and other factors related to profitability and reputation, and it is also considered a benchmark for comparing the efficiency and performance of organizations [1]. However, a comprehensive examination of productivity must take into account the behavior and health of employees. Identifying the psychosocial factors at work that impact employees' health is crucial for managers who aim to predict presenteeism and productivity for success within their organization. Presenteeism is an important indicator of health-related productivity in organizations. It occurs when an employee is present in the workplace but is not meeting expected levels of production, and the quality of their work is lower than normal [2].

Work-related psychosocial stressors are among the most significant variables affecting employee productivity. The International Labor Organization (ILO) defines work-related psychosocial factors as the "interactions between and among the work environment, job content, organizational conditions, and workers' capacities, needs, culture, and personal extra-job considerations that may, through perceptions and experience, influence health, work performance, and job satisfaction" [3]. Some of the most important psychosocial stressors include job content [4, 5], workload [5, 6], job autonomy [7, 8], role clarity [9], job security [10], distributive and procedural justice [11], and social support [12].

Job content refers to the degree of control and responsibility associated with an employee's assigned tasks, the potential for growth and success in the job, and the value and significance of the job from the employee's perspective. Workload denotes the amount of work assigned to an employee and is directly associated with stress levels and an employee's intention to change jobs [4, 5]. Job autonomy refers to the degree of independence and freedom of action that employees have, as well as their power to manage and express their opinions [8]. Role clarity relates to the alignment of the work with the main goals and objectives of the organization, including its priorities and the means by which they can be achieved [9]. Job security exists when a person feels that they have a good job and is confident that their position is not threatened in any way [10]. Organizational justice is a fundamental component of job satisfaction and, consequently, the effectiveness of organizational processes. Distributive justice refers to the equitable distribution of the organization's resources and benefits, including salaries, rewards, and job responsibilities, while procedural justice pertains to the fairness of the methods used to determine job outcomes [8, 11]. Social support involves receiving the assistance or help that

employees need to perform their jobs successfully and is influenced by the nature of the relationship between employees and the organization [12]. This relationship is rooted in the types of interactions that occur between employees and the organization [3].

There is substantial evidence that psychosocial stressors can affect the physical and mental health and well-being of employees. Similarly, employees' behaviors in the work environment depend on their abilities, needs, expectations, culture, and personal lives, reflecting the view that person-environment interactions in the workplace are dynamic [13, 14]. Critically, when the person-environment fit is poor, there is an increased risk of mental and physical illness. Consequently, an employee may experience reduced job satisfaction, decreased job performance, and increased presenteeism and sickness absence, potentially leading to leaving the organization [15]. Therefore, for psychosocial conditions at work to have a positive effect, particularly regarding health and productivity, it is essential to establish optimal working conditions. An important challenge for many managers is their incomplete understanding of the issues detailed above, which hinders making reliable predictions concerning the factors that affect employee performance and developing appropriate interventions. There is a clear need to develop a model to predict productivity to support this. Moreover, a review of the literature reveals a lack of studies that have addressed the mediating role of physical and mental health in the relationship between work-related psychosocial stressors and employee productivity.

This study aimed to develop a model for predicting productivity (presenteeism) based on job stressors and the mediating role of physical and mental health among office workers. The independent variables of job content, workload, job autonomy, job security, role clarity, distributive justice, procedural justice, management support, and colleague support were included in the model as predictors or antecedents of presenteeism. Physical and mental health were also considered mediating variables in the model. It should be noted that presenteeism was regarded as an indicator of productivity and as an outcome variable in the conceptual model.

## Instrument and Method

### Participants

This cross-sectional analytical survey study was done on all administrative staff working at Shiraz University of Medical Sciences in 2019. The inclusion criterion was having more than one year of work experience, while the exclusion criterion included experiences of non-work-related physical and mental illness. Sampling was conducted as a census, and all 921 employees who met the inclusion criteria were included in the study, with 651 of them agreeing to participate and completing the questionnaire. Of the

651 submitted surveys, 37 were not included in the final analysis due to missing more than 20% of the data, incomplete answers, and social desirability bias. Data from a total of 614 anonymous surveys were used in the analyses. This sample size was more than adequate for structural equation modeling (SEM) [16]. The purpose of the study, instructions on how to answer the questions and the ethical obligations of the researchers regarding the completed questionnaires were explained to the employees. Subsequently, a questionnaire was distributed to each consenting participant, along with information on how to return it to the researchers after completion. Participation in this research was entirely voluntary, the questionnaires were anonymous, and the results were analyzed based on the information provided by all respondents.

### Tools

The survey was made up of the following questionnaires:

**Job stress:** Four subscales of the Stress Indicator Tool (SIT) (Cousins *et al.*) were used to measure job stress. These subscales assessed workload (eight items), autonomy (six items), colleague support (five items), and managerial support (four items). Items were scored using five-point frequency or agreement Likert scales ranging from one to five, with higher scores indicating higher levels of job stress. Good reliability was confirmed by Cousins *et al.*, with Cronbach's alphas of 0.89, 0.78, 0.81, and 0.87, respectively. In the current study, Cronbach's alphas for workload, autonomy, colleague support, and managerial support were 0.89, 0.88, 0.91, and 0.88, respectively [17].

**Job security:** The five-item Job Security Scale (Kuhnert *et al.*), where the items were scored using a five-point Likert scale (one=strongly disagree to five=strongly agree), with a high score indicating high job security. Kuhnert *et al.* reported a Cronbach's alpha of 0.79 [18]. In this study, Cronbach's alpha was 0.87.

**Role clarity:** The four-item Role Clarity Scale developed by Rizzo *et al.* was used. Items were scored using a five-point Likert scale (one=strongly disagree to five=strongly agree), with a high score indicating high role clarity. Rizzo *et al.* reported a Cronbach's alpha of 0.82 [19]. In this study, Cronbach's alpha was 0.77.

**Distributive justice:** The four-item distributive justice subscale of a questionnaire developed by Bavenham *et al.* (1986) was used. Items were scored using a five-point Likert scale (one=strongly disagree to five=strongly agree), with a high score indicating high distributive justice. Bavenham *et al.* reported a Cronbach's alpha of 0.95 [20]. In this study, Cronbach's alpha was 0.89.

**Procedural justice:** Procedural justice was measured using a four-item subscale based on items from Greenberg's scale. Items were scored using a

five-point agreement scale, with higher scores representing more positive responses. The scale demonstrated reliability, with a Cronbach's alpha of 0.78 [21].

**Job content:** The eight-item intrinsic reward subscale of a questionnaire developed by House *et al.* was used to measure job content. The items assess the extent to which work is varied, challenging, and interesting [22].

In this study, items were scored on a five-point Likert scale (one=strongly disagree to five=strongly agree). Scores ranged from 1 to 40, with higher scores indicating a higher intrinsic reward. In this study, Cronbach's alpha was 0.89.

**Physical Health Questionnaire (PHQ):** The PHQ contains 14 items that measure physical health using four subscales: sleep disorders, headaches, gastrointestinal problems, and respiratory problems. The validated Persian version of the PHQ was used in this study [23]. Items in the questionnaire were scored using a seven-point Likert scale (never, rarely, occasionally, sometimes, often, very often, and always). Scores ranged from 14 to 98, with higher scores indicating better physical health. In this study, Cronbach's alpha was 0.82.

**Mental health:** Mental health was assessed using the Persian version of the Depression, Anxiety, and Stress Scale (DASS-21) (Sahebi *et al.*). The DASS-21 consists of 21 statements measuring negative emotional states related to depression, anxiety, and stress. Items were evaluated on a four-point Likert scale (0=not relevant, 1=somewhat relevant, 2=quite relevant, and 3=highly relevant). High scores indicate poorer mental health [24]. In this study, Cronbach's alpha was 0.95.

**Stanford Presenteeism Scale (P-SPS-6):** The Persian version of the six-item Stanford Presenteeism Scale was used to assess employee productivity (Abdi *et al.*). Items were scored using a five-point Likert scale (one=strongly disagree to five=strongly agree). High scores indicate a low level of presenteeism. Abdi *et al.* reported a Cronbach's alpha of 0.86 [25]. In this study, Cronbach's alpha was 0.81.

### Data analysis

First, data distributions were examined, and with confirmation that parametric assumptions were not violated, the mean, standard deviation, and Pearson zero-order correlations were calculated. Subsequently, more complex analyses were performed to evaluate the fit indices of the proposed model through SEM using SPSS (version 23) and AMOS (version 23). To assess the fitness of the proposed model with the mixed data, the normed chi-square ( $\chi^2/df$ ), comparative fit index (CFI), incremental fit index (IFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), goodness-of-fit (GOF) index, and normed fit index (NFI) were used.

**Findings**

Participants included 614 employees with a mean age of 40.18±7.80 years, ranging from 22 to 58 years, and an average of 14.49±6.83 years of work experience (Table 1).

**Table 1.** Frequency of the participants' demographic characteristics

Variables	Values	
<b>Sex</b>	Female	383(62.4)
	Male	231(37.6)
<b>Education level</b>	High school diploma	13(2.1)
	Associate degree	25(4.1)
	Bachelor of Science	289(47.1)
	Master of Science	233(37.9)
	PhD	54(8.8)
<b>Occupation</b>	Employee	537(87.5)
	Manager	77(12.5)
<b>Employment status</b>	Permanent employment contracts	338(55.1)
	Fixed-term contracts	276(44.9)

With the exception of workload, all psychosocial factors were significantly correlated with presenteeism. Moreover, the correlation coefficients among all predictor variables were less than 0.8, indicating that there was no collinearity among these

variables. The conceptual model of the study was tested using AMOS software (Table 2).

Among the studied indicators, workload, colleague support, managerial support, role clarity, and procedural justice had a significant direct relationship with mental health. Workload, managerial support, and job content exhibited a significant positive relationship with physical health. The workload had the greatest direct effect on both mental health ( $p < 0.001, \beta = 0.249$ ) and physical health ( $p < 0.001, \beta = -0.173$ ). Additionally, mental health ( $p < 0.001, \beta = 0.166$ ) and physical health ( $p < 0.001, \beta = 0.175$ ) had a similar direct effect on presenteeism. The findings also illustrated a mediating pathway between mental health and physical health. Specifically, mental health had a substantial impact on physical health ( $p < 0.001, \beta = 0.569$ ), and one of the mediating pathways of the relationship between occupational and organizational risk factors and presenteeism was through the impact of mental health on physical health (Table 3).

The assessment of the fit indices confirmed the validity of the final model and all fit indices of the model were within the acceptable range (Table 4).

**Table 2.** Correlation between the study variables (n=614)

Variable	Mean(SD)	12	11	10	9	8	7	6	5	4	3	2	1
<b>1-Presenteeism</b>	17.8(2.7)	0.33**	0.09*	0.11**	0.26**	0.36**	0.66**	0.24**	0.15**	-0.01	0.12**	0.14**	1
<b>2-Mental health</b>	63.7(13.7)	0.25**	0.22**	0.22**	0.12**	0.02	0.14**	-0.14**	0.12**	-0.29**	0.65**	1	
<b>3-Physical health</b>	69.4(10.5)	0.28**	0.15**	0.18**	0.04	0.04	0.09*	0.04	0.08	-0.36**	1		
<b>4-Workload</b>	20.8(6.9)	-0.23**	-0.13**	-0.30**	0.001	-0.09*	-0.06	-0.04	-0.16**	1			
<b>5-Autonomy</b>	16.5(3.8)	0.21**	0.09*	0.05	0.06	0.10**	0.12**	0.08*	1				
<b>6-Job security</b>	14.7(3.7)	0.21**	0.03	0.02	0.33**	0.31**	0.50**	1					
<b>7-Colleague support</b>	11.0(4.4)	0.42**	0.06	0.113**	0.49**	0.61**	1						
<b>8-Managerial support</b>	10.6(4.0)	0.44**	0.13**	0.16**	0.57**	1							
<b>9-Role clarity</b>	11.3(2.7)	0.41**	0.07	0.18**	1								
<b>10-Distributive justice</b>	19.3(4.2)	0.45**	0.77**	1									
<b>11-Procedural justice</b>	13.5(4.3)	0.48**	1										
<b>12-Job content</b>	16.1(5.6)	1											

\*Significant at 0.05; \*\*Significant at 0.01.

**Table 3.** The direct, indirect, and total effects of the predictor variables on presenteeism, physical health, and mental health

Outcome variable	Predictor variable	Direct effect	Indirect effect	Total effect
<b>Presenteeism</b>	Distributive justice	0.126	-	0.126
	Job content	0.194	0.049	0.145
	Procedural justice	0.321	0.043	0.278
	Role clarity	-	0.031	0.031
	Managerial support	0.140	0.082	0.058
	Colleague support	-	0.030	0.030
	Job security	-	0.020	0.020
	Autonomy	-	0.021	0.021
	Workload	-0.190	-0.096	-0.093
	Mental health	0.166	0.10	0.265
	Physical health	0.175	-	0.175
	<b>Mental health</b>	Distributive justice	-	-
Job content		0.086	-	0.086
Procedural justice		0.161	-	0.161
Role clarity		0.117	-	0.117
Managerial support		0.225	-	0.225
Colleague support		0.112	-	0.112
Job security		0.076	-	0.076
Autonomy		0.077	-	0.077
Workload	-0.249	-	-0.249	
<b>Physical health</b>	Distributive justice	-	-	-
	Job content	0.150	0.049	0.199
	Procedural justice	-	0.092	0.092
	Role clarity	-	0.066	0.066
	Managerial support	0.129	0.128	0.257
	Colleague support	-	0.064	0.064
	Job security	-	0.043	0.043
	Autonomy	-	0.044	0.044
	Workload	-0.173	-0.142	-0.314
	Mental health	0.569	-	0.569

**Table 4.** Fit indices of the model

Model	X <sup>2</sup> /Df	Goodness-of-fit index (GFI)	Comparative fit index (CFI)	Incremental fit index (IFI)	Root mean square error of approximation (RMSEA)	Adjusted goodness of fit index (AGFI)	Tucker-Lewis index (TLI)	Normed fit index (NFI)
Conceptual model	58.51	0.616	0.140	0.150	0.306	0.190	-0.535	0.147
Modified model	40.62	0.638	0.247	0.253	0.254	0.399	-0.057	0.248
Final model	4.31	0.965	0.957	0.958	0.074	0.915	0.912	0.946
Acceptable range	<5	>0.9	>0.9	<0.08	<0.08	>0.9	>0.9	>0.9

## Discussion

The aim of this study was to develop a model for predicting productivity associated with presenteeism, focusing on occupational stressors and the mediating role of physical and mental health in university administrative staff. Overall, the findings suggested that among the stressors studied, workload acted as a negative predictor, while colleague support, managerial support, role clarity, job autonomy, and procedural justice served as positive predictors of employees' mental health. Regarding employees' physical health, only workload, managerial support, and job content had positive and significant relationships with the outcome variable. Additionally, workload, job content, managerial support, distributive justice, and procedural justice were direct predictors of productivity associated with presenteeism.

This study presented a new approach to predicting productivity in organizations that can be used to develop programs aimed at increasing employee productivity. One of the important contributions of this study is the introduction of a new indicator tool based on employee presenteeism to predict productivity. We examined a wide range of factors for predicting productivity through modeling and path analysis of factors affecting performance using the SEM method, whereas most previous studies have focused solely on factors associated with safety performance. The SEM method provides more reliable results than other conventional methods by considering the simultaneous effects of predictor variables on the outcome variable, as well as accounting for existing errors.

The results indicated that, in addition to a direct effect on productivity associated with presenteeism, workload also had indirect effects through the mediating role of employees' mental and physical health. Previous studies have reported conflicting results regarding the way workload affects employee productivity. In line with the present study, some research has shown that an increase in workload reduces or hinders performance; however, there are also studies that have reported contradictory findings [26-28]. This lack of consensus is challenging to resolve, except by considering that there are caveats and mediators that contribute to both objective and subjective workload. For example, Brown and

Benson [26] argued that organizational practices and appropriate performance appraisal can enable employees to take on more work and improve productivity. Similarly, Kc and Terwiesch found that healthcare workers rose to the challenge as the workload increased to meet operational demands. They cautioned, however, that there is a threshold above which increased workload negatively impacts performance. Kc and Terwiesch found that a 10% increase in workload corresponds to a 2% increase in patient mortality [27]. They suggested that workers' own "selecting-optimizing-compensating" strategies predict performance when job demands increase. They also found differences in the extent of performance decrease due to job intensification, depending on the task and occupational groups [28]. Correspondingly, physicians with increased workloads compensate by being less meticulous with their paperwork [29]. Ultimately, the negative impact of increased job demands on productivity is not straightforward. Various studies refer to different mediators that are not negligible. In this study, in addition to the direct negative effect of increased demands, there were also influences from the indirect effect of workload on physical and mental health. This finding confirms the mediating role of physical and mental health in the relationship between workload, job autonomy, and presenteeism, as shown in a study by Pohling *et al.* [30]. The chronicity of increased workload is an important aspect of this argument, as health disorders do not occur suddenly when workload increases. Work overload ultimately reduces the body's energy capacity to return to normal levels and causes psychological ill health in employees [31].

Consistent with a study by Janssens *et al.* [32], the present study found that job autonomy was not associated with presenteeism as a predictor of employee productivity. Although only a few studies have investigated the relationship between job autonomy and presenteeism, several studies have used job autonomy as a proxy measure for productivity, finding that job autonomy is a significant predictor of productivity [33-35]. It is relevant to note that the present study demonstrated a significant positive relationship between job autonomy and mental health, which, in turn, acts as a mediator of presenteeism, our proxy measure of

productivity. Essentially, this finding aligns with Karasek's job demand-control theory, which posits that jobs with a high workload but low job autonomy are stressful and that employees in such jobs are more prone to mental disorders [35]. Similarly, the findings of this study confirmed a negative effect of workload and a positive effect of job autonomy on employees' mental health.

Job security was not significantly associated with any of the variables of presenteeism, mental health, or physical health in this study of university administrators. This contrasts with several studies that have shown a positive association between presenteeism and reduced job security, with arguments suggesting that employees attend work despite illness due to fear of losing their jobs [30, 36, 37]. Some researchers have also reasoned that job insecurity hinders the empowerment of employees in professional dimensions, practical courage, experience, job satisfaction, work conscientiousness, and job promotion opportunities, thereby reducing employee productivity [38]. Some possible reasons for the discrepancy between the findings of the present study and those of previous studies include the use of different indices to predict employee productivity, varying cultural and organizational characteristics of the research samples, and the potential impact of other predictors on employee presenteeism and physical and mental health.

The present study also showed that colleague support did not have a significant relationship with productivity associated with presenteeism. This finding is consistent with the observations made by Yang *et al.* [39], although both of these more recent findings are at odds with the results reported by Grandpierre *et al.* [40]. Although the mechanism underlying the effect of colleague support on performance and productivity has not been well defined, some believe that good relationships between co-workers promote job satisfaction and improve organizational climate, thereby increasing productivity [41]. The present study verified that colleague support had a positive and significant relationship with mental health, as well as a relationship with physical health. While no study has specifically addressed the relationship between colleague support and employees' physical health, there is strong evidence that colleague support positively affects employees' mental health, confirming its role in improving stress and associated disorders.

Regarding managerial support, there were correlations with productivity associated with presenteeism, both directly and indirectly through the mediating role of employees' mental and physical health. This finding supports various other studies that have shown both direct [42] and indirect [2] relationships between managerial support and reduced levels of presenteeism. If management supports its employees and is committed to their

safety and health, employees will experience higher levels of physical and mental well-being.

Role clarity had no significant relationship with productivity associated with presenteeism. Similar findings were reported by Zhou *et al.* [9]. This study also showed that role clarity had a positive and significant relationship with mental health, as indicated in previous studies by Inoue *et al.* [43] and Harvey *et al.* [44], but it had no significant relationship with physical health. Role ambiguity appears to impose a high cognitive and intellectual load on employees, leading to mental and intellectual fatigue, while high levels of physical workload negatively affect a person's physical health [43]. Accordingly, the lack of a significant relationship between role clarity and physical health in this study can be attributed to the occupational nature of the population studied, which does not impose substantial physical workloads on individuals.

The findings of the present study indicated that both distributive justice and procedural justice were directly correlated with productivity associated with presenteeism. A comparison of the studied variables revealed that distributive justice had the strongest relationship with productivity associated with presenteeism. These findings align with previous studies [44, 45]. The association of distributive and procedural justice with productivity can be justified by referring to content theories, which provide a context for what motivates employees to perform well and explain that people react negatively to unfair relationships. Similarly, research suggests that employees who perceive the organization's procedures as just will be more productive [46]. This study also showed that distributive justice had no significant relationship with mental and physical health, while procedural justice was directly correlated with mental health and indirectly correlated with physical health. Other studies have also reported a positive effect of procedural justice on employees' health, particularly mental health [8, 47]. In this study, mental health and physical health were included in the conceptual model as mediating variables and antecedents of productivity associated with presenteeism; both mental health and physical health had significant relationships with presenteeism. Similarly, Pohling *et al.* reported that physical and mental health serves as mediators in the relationships between job-related factors (including workload, job autonomy, reward systems, and organizational values) and presenteeism [30].

While the present study has many strengths, one of its limitations was that the research was conducted using cross-sectional data from only one organization in one sector (university administration). Therefore, its results cannot be reliably generalized. Additionally, despite efforts to consider the most important factors affecting employee productivity, it was not possible to address all potential influences on productivity in a single study. Consequently, we

recommend that future studies examine the effects of other important job and organizational variables, such as reward systems, motivation, leadership style, and organizational commitment. Finally, despite the numerous advantages of structural equation modeling, this method is unable to capture causal relationships among variables. Intervention programs developed to maintain and improve employee productivity in an organization should first focus on these four occupational and organizational variables. Moreover, to promote productivity, there is a need to monitor and support the mental health status of employees.

## Conclusion

Psychosocial factors, including distributive justice, job content, and procedural justice, have the greatest impact on employee productivity and employees' mental health plays an important mediating role in the relationship between work-related psychosocial factors and productivity.

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