

Job demand-control and job stress at work: A cross-sectional study among prison staff

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ABSTRACT

Introduction: Job stress can impose significant costs to the workplaces and organizations due to some issues such as absenteeism, less productivity, and medical costs. Job overload and lack of decision latitude can lead to job stress. The current study aimed to investigate the job demands and control as predictor of job stress and its relationship, with some of the demographic characteristics of Iranian prison staff. **Materials and Methods:** This study was performed on 171 male employees working in four prisons located in Ilam, Iran. The sampling method was census and all four prisons' staff were selected to respond the Job Content Questionnaires. Finally, the data were analyzed using *t*-test or independent samples test as well as SPSS 20. **Results:** The highest amount of job demand (mean = 21.28) and the lowest amount of job control on average (9.76) were reported by those staff working in Darehshahr prison. There was also a significant relationship between job post and job control among the prison staff ($\beta = -0.375, P = 0.001$). **Conclusion:** The level of job stress reported by prison staff was high in this study mainly caused by high job demand and low job control, especially in Darehshahr prison staff.

Key words: Job control, job demands, job stress, prison staff

INTRODUCTION

Over the past three decades, work-related stress has been an increasing concern for employees, employers, and organizations all over the world. According to the WHO prediction, by 2020, stress will result in workplace ill health.^[1] Many studies carried out on long and high-level job stress, following by some negative impacts on public health both physically and psychologically.^[2-4] Sixty-one percent of employees report that work is a considerable source of stress, and 41% believe that they feel tense or distressed during a workday.^[5] Job stress can impose significant costs to the workplaces and organizations due to some issues such as

absenteeism, less productivity, and medical and insurance costs which are estimated annually for U.S. industry more than \$300 billion.^[6] Researches show that in 2007, nearly 14.4% of employees in Iran were suffering from high job stress.^[7] According to the literature review, work-related stress depends on many parameters that are mostly subjective such as an employee's characteristics as well as the ability to cope with psychological pressure.^[8,9]

Of the parameters affecting job stress, job demands and control (JDC) (decision latitude) are two important factors that can be measured using JDC model developed by Karasek, 1979. JDC model like some other models is able to convert more precisely subjective parameter of work-related psychological pressure to a measurable factor of job stress. It has concentrated on the interaction between two job stress predictors that are JDC. The term "job demand" in this

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model refers to the amount of workload or responsibilities placed upon an individual. Increasing the workload as well as time limit of the individual to cope with it may result in psychological pressure in the workplace. Control or the ability of decision-making over one's work has a strong impact on perceived stress. The most stressful situation occurs for the employees when experiencing both high job demands and low job control.^[10,11]

Those high job demands accompanied with high decision latitude are not stressful since the active jobs are considered as challenging situations, in which people can extend the defending behaviors. The passive jobs with high demands and low decision latitude are not able to trigger such behaviors leading to decreasing activity and increasing stress. The situations under pressure are those in which the employees expose to the high job demands but low decision latitude. One method to investigate JDC model is considering the fact that demand and control interactions are more related to job stress when lower decision latitude.

The JDC model predicts two consequences for job demands: Psychological pressure during job or consequences related to learning at work. The combination of high job demands accompanied with job control, therefore, may cause both physical and psychological strain called job stress. However, the jobs in which JDC are high, lead to experiencing a feeling of self-efficiency and self-esteem by the person called active learning. Hence, the JDC model is based on the fact that when there are high job demands, the job control would not only play a protective role against increasing physical and psychological pressure but also provide a feeling of success, merit, and self-efficiency. In a study done by Häusser, *et al.*, the JDC model provided some positive effects on productivity and active learning due to the combination of high job demands and high control. After implementing an experimental assimilation in that study, job demands had positive effects on quantitative productivity while high controlled to increasing the speed and preciseness at work.^[12]

Many studies show that the most widely used scale to measure work-related stress based on defining higher job demands and lower job control and using it to specify a certain group with high job stress is the Job Content Questionnaire (JCQ) developed by Karasek.^[13-15]

There are studies in Iran carried out using JDC model. Jahanbakhsh *et al.* studied the relationship between job control and the level of stress as well as mental health parameters among petrochemical personnel in Isfahan (one of the cities in Iran) using the job design questionnaire developed by Jackson Wall and Mullarkey as predictor variable. In this study, it was expressed that if making job decisions and managing the way of performance were impossible during the work, the job stress would emerge and mental health would be endangered. Using some innovative methods such as partaking staff in decision-making, providing the opportunity of setting their own timetable may provide a higher control power in the

individuals' job; therefore, their stress could be reduced and their mental health would be improved.^[16] In another study carried out by Oraizi and Ahmadi, the effect of JDC on the level of plasma lipid, depression, fatigue, and workload was investigated. Based on their results, higher job demands led to emotional fatigue incidence following by increasing plasma lipid. Moreover, it was found that job control can be considered as a supportive and protective agent against job burnout.^[17] In a study done by Jahanbakhsh Ganje and Oraizi, it was found that when high job demands are accompanied with the lack of job controls, the staff job stress will increase. Furthermore, higher job demands may lead to a merit and self-efficiency feeling among the personnel, in case the level of job control also is high.^[18]

There are many studies conducted on different occupations with high levels of job stress to investigate work-related psychological pressure caused by different stressful situations in the workplaces. Of all occupations, working in jail as a prison officer has been ranked among the most stressful situations.^[16-18] Moreover, Baillargeon *et al.* also reported that the stress levels found among prison staff have been reported higher than some other different occupations and tasks discussed in many previous studies.^[19]

Prison staff, however, have different responsibilities and tasks which have been narrowly defined, but all are in danger of stress because of the same characteristics of all their positions including security, care, and importance of controlling over the prisoners.^[20] According to the study carried out by Daniel, 2006, the probability of committing suicide among prison staff was higher than other working population with the same age.^[21]

Flin and Mearns, in their study found that mainly job stress would emerge due to some organizational issues such as role conflict and exciting abnormalities, and despite the public idea, the percentage of time spent with prisoners would decrease the magnitude of job stress.^[22]

In another study performed by Stack and Tsoudis, the psychological pressure due to the particular career in prison was clearly indicated.^[23] Those who choose prison as a workplace to work may face many problems such as work overload (high demands) as well as requiring social interacts with surrounding people. These factors not only affect the prison staff but may also cause serious consequences for their family members and the organization.^[24] Furthermore, one of the remarkable advantages of using the JDC model is characterizing different tasks in terms of the possible workload and decision latitude leading to job stress. This advantage refers to the fact that JDC model can predict each required job characteristics such as being active, passive, or high strained that would be more highlighted when there is necessity to classify jobs with different stress levels related to them.^[25]

Prison is considered as one of the most important parts of the judge system, in which working condition provides

the exposure to different stress sources as well as difficult limitations allocated to prison environment. Closed compulsory working environment, necessity of the violence implementation, performing hard duties associated with keeping order and security in a prison, overworking, and shift work are some factors that have made prisons special^[26] These particular characteristics require personnel working in prison with different job demands that their imbalance with job control results in the incidence of different levels of job stress. The presence of job stress and work stressors in those organizations with high necessity of security as prisons can negatively affect the staff health and productivity and may impose some consequences on organization. Considering the fact that working in such environments can be mostly dangerous and needs especial demands and control, this study intended to evaluate JDC and its link to job stress among the prison staff.

METHODS

Sampling design

This study was performed in 2012. Respondents were 171 male employees working in prisons located in Ilam Province, Iran.

The inclusion criteria to participate in this study were to have working experience of at least 1 year in that certain position, to be generally healthy and to fill the job stress questionnaire completely. The exclusion criteria were the participants' wish not to continue, incomplete filling of the job stress questionnaire subscales, or recorded any interfering physical or mental diseases such as depression and psychological disorders, cardiovascular diseases, and severe musculoskeletal problems. The sampling size was based on census method including 188 staff working in Ilam prisons, out of which 177 people participated in this study because of exclusion criteria.

Totally, there were four prisons in Ilam to include in this study. The sampling method was census and all four prisons' staff were selected to respond to the questionnaires. The target prisons included Central prison 90 (51/3%), Dalab prison 41 (23/7%), Darehshahr prison 25 (13/9%), and juvenile correctional center 21 (11/1%). The prisons included in this study were varied regarding the type of crime attributed to the prisoners. Central prison was allocated to the prisoners with higher level crimes such as murderer, assault, kidnapping, and robbery. The prisoners attributed with the crimes such as robbery, assault, and drug abusing were kept in Dalab prison. Darehshahr prison was allocated to the crimes such as financial problems and drug abuse. The juvenile correctional center was mainly keeping guilty juveniles. All participants in the current study were classified into seven groups in terms of their occupant posts including security officers, correctional officers, health service, lieutenant, administrative staff, social professionals, and rehabilitation staff.

Before distributing the questionnaires among the participants, the research team including the researcher and some other experts in the field of this study were present in target prisons.

All participants were informed about the study purpose as well as the way of filling in the questionnaires. They also were ensured that their information would be kept and secured, and they could respond to the survey questions honestly. After distributing the questionnaires, the participants answered the questions in a certain room and with normal condition to eliminate any deviating factor which could lead to a temporal anxiety or stress. The questionnaires were then collected by the research team.

Measures

Job demands and job control

the concepts of psychological demand and decision latitude (control) in target population were measured using a series of questionnaires based on the Karasek's JDC model. This questionnaire, known in some studies as the JCQ, totally contains 24 questions that the first ten questions were related to the job control and the second 14 questions were associated to the job demands.

A 3-degree (0–2) scale (yes, to some extent, and no) has been considered for this questionnaire. The final score, therefore, would be in 0–20 and 0–28 ranges for job demand and job control, respectively. Depending on the both parameters of this questionnaire (job demands and job control), four working conditions could be defined: High-strain jobs (high demands and low controls), low-strain jobs (low demands and high controls), active jobs (high demands and high controls), and passive jobs (low demands and low controls). To dichotomize the (low/high) scale, the moderate level was considered as cutoff point.^[27]

Factor analysis was used to distinct the most important questions used in this study. Job control or decision latitude of the employees was studied through the questions such as do you yourself decide about the priority of your jobs? or do you yourself decide when to begin part of your jobs? or do you arrange your job speed yourself? The concept of job demands also was measured mainly through the questions such as does your job require all your attention? or do you have to follow more than one process simultaneously?.

The questionnaire used in the current study was translated in Iran by Jahanbakhsh, Oraizi, Molavi, and Noori. The validity of the questionnaire was confirmed by professional consultants and assistant professors. The reliability of the job control, job demands, and total (JDC) were 0.85, 0.82, and 0.80, respectively.^[16]

Furthermore, the validity and reliability of JCQs were investigated by Barzideh *et al.*^[28]

Job stress

Job stress was evaluated in this study using the HSE standard questionnaires. These questionnaires were developed in 1990 by Health and Safety Executive, UK, and measure the British workers and employees. The questionnaire contains 35 questions which totally evaluate the amount of job stress.

The process of answering to this questionnaire was based on Likert scale, in which responses are categorized into five ranks including always, often, sometimes, rarely, and never, and each question can gain the score from 5 (always) to 1 (never). The total score can obtain a comprehensive concept related to job stress to be interpreted.

The validity and reliability of the HSE questionnaires were investigated in Iran in the study done by Azad *et al.* in Zolo, and the results were statistically acceptable ($\alpha = 0.78$ and Spearman-Brown coefficient = 0.65).^[29]

The data were analyzed using SPSS (IBM SPSS Statistics, version 20) and single-group MANOVA statistical method as well as one-way variance analysis test. This method can be used when the aim is evaluating two collections of variables in one group which can be done by common regression method as well. However, using SPSS 18 single-group MANOVA analysis method can be applied instead by which overlapping of variables would be automatically controlled.

RESULTS

The current study was performed with intent of the evaluation of job stress based on JDC model with the job task and working hours. The mean age of prison staff was 31.34 (± 7.91) years. Furthermore, the mean (standard variation) of the height, weight, and body mass index of the subjects was 177 (6.64) cm, 78.35 (9.33) kg, and 24.97 (2.44) kg/m², respectively. Mean (standard variation) of working years, weekly hours working, and monthly extra working hours was 7.78 (5.55) years, 57.61 (13.25) hours, and 8.89 (50.94) hours among the subjects.

As it can be inferred, those staff working in Darehshahr prison spend more time working in the workplace than the staff working in Central prison (59/63, 12/8), Dalab prison 50.71 (7.75), and juvenile correctional center 58.16 (17.69). Those staff working in Dalab prison had higher tenure (9/71) compared to those working in Central prison (6/67), Darehshahr (7/15), and juvenile correctional center (9/57).

Job demand

Figure 1 shows the level of JDC by prison. The highest amount of job demand is for Darehshahr prison (mean = 21.28). The mean value obtained for other prisons including Central prison, Dalab prison, and juvenile correctional center was 18.68, 19.65, and 18.05, respectively. Totally, the mean job demand in all four prisons was 19.21. The amount of job demand people working in prison experience has also been illustrated in Table 1 which is characterized by different job groups. The highest amount of job demand on average (21.18) was reported by those staff working as lieutenant. Security officers are another postgroup those staff working as security officer reported the level of job demand (20.82) on average. The amount of job demand reported by other postgroups including administrative, health, correctional officers, social

professionals, and rehabilitation staff was on average 19.12, 19.00, 18.50, 17.79, and 17.66, respectively.

Job control (decision latitude)

The level of job control reported by the prison staff working in deferent prisons is indicated in Figure 1. As it can be inferred, the lowest amount of job control on average (9.76) was reported by those staff working in Darehshahr prison. The mean level of job control reported by the staff in other prisons including Central prison, Dalab prison, and juvenile correctional center was 11.38, 12.19, and 11.20, respectively. The total mean job control reported by staff in all prisons was 19.21.

Job control also is characterized by different job groups in this study. As it can be observed in Table 1, the lowest amount of job control on average was reported by these staff working as lieutenant. The staff working in security officers reported their job control 20.82 on average. Other people working in job groups including social professionals, rehabilitation staff, correctional officers, and health service and administrative staff reported the mean level of their job control as 13.37, 12.61, 11, 10.75, and 10.48, respectively. The total mean job control reported by all staff was 11.00.

Job stress

In this study, the level of job stress experienced by the prison staff in Ilam was evaluated using HSE questionnaire. Figure 2 shows the mean level of job stress reported by the prison staff in terms of the kind of prison. As it can be inferred, the highest mean job stress (mean = 99.12) was reported in Darehshahr prison. The mean level of job stress reported by the staff working in other prisons including Central prison, Dalab prison, and juvenile correctional center was reported, 98.74, 95.60, and 85.71, respectively. The total average of staffs job stress in all prisons was 96.52.

The level of job stress among people working in Ilam prisons was also characterized by different job groups. The results have been illustrated in Table 1. As it is clear, the highest level of job stress (mean = 100.12) was reported by those working as lieutenant. The mean level of job stress reported by people working in other groups including security officers,

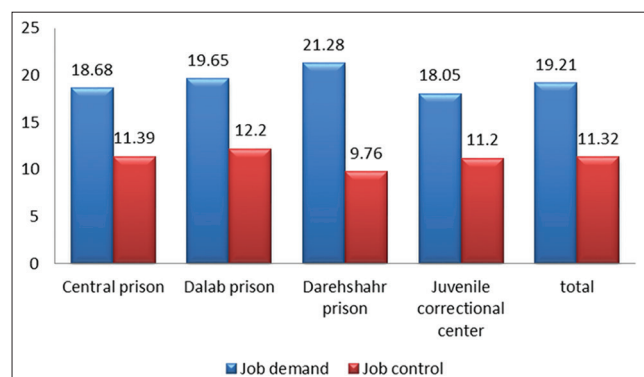


Figure 1: Job demands and control among four prisons

Table 1: Means of job demands, job control, and job stress among different posts in the prisons

Variables	Mean \pm SD							
	Security officers	Health	Social professionals	Rehabilitation	Correctional officers	Administrative	Lieutenant	Total
Job control	10.68 \pm 4.87	13.37 \pm 4.1	12.61 \pm 3.9	11.0 \pm 2.64	10.75 \pm 2.98	10.48 \pm 4.55	7.87 \pm 4.97	11.0 \pm 4.59
Job demands	20.82 \pm 3.33	19 \pm 4.89	17.79 \pm 2.87	17.66 \pm 5.5	18.5 \pm 5.8	19.12 \pm 3.63	21.18 \pm 3.31	19.36 \pm 3.69
Job stress	98.13 \pm 14.94	88.62 \pm 9.97	97.41 \pm 14.54	98.66 \pm 4.93	89.0 \pm 12.24	97.44 \pm 16.64	100.12 \pm 21.79	97.11 \pm 15.74

SD = Standard deviation

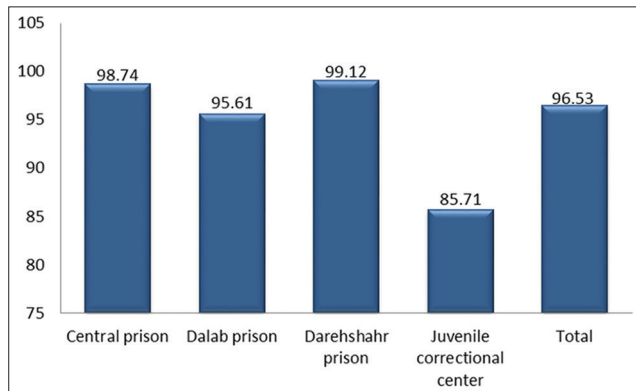


Figure 2: Means of job stress among four prisons

administrative staff, correctional officers, social professionals, and health service and rehabilitation staff was 98.13, 88.62, 97.41, 98.66, 89.00, and 97.44, respectively. Totally, the mean job stress reported by prison staff in Ilam was 97.11.

Results showed that there is a significant relationship between job demand and the number of working hours per week ($P = 0.005$, $\beta = 0.318$) and education and job demand ($\beta = -0.359$, value = 0.002). Of course, the relationship between job demand and some other demographic characteristics such as age, marital status, job position, and the number of working hours per week was not statistically significant. There is also a significant relationship between job post and job control among the prison staff ($\beta = -0.375$, $P = 0.001$). There is a high relationship between job control and the number of working hours per week, but the relationship was not statistically significant.

Based on Figure 1, the amount of job demands was 66.71%, 70.17%, 68.60%, and 76% for Central prison, Dalab prison, Darehshahr prison, and juvenile correctional center, respectively. Moreover, the amount of job control for these four prisons was 56.95%, 61%, 48.8%, and 56%, respectively. As the cutoff (reference point) for evaluating JDC was moderate level, JDC were both reported high among the personnel of Central prison, Dalab prison, and juvenile correctional center and can be considered as active jobs. However, reporting high job demand and low control, the personnel of Darehshahr prison was classified as high strain group. According to Table 1, as it can be seen, the level of JDC is high among the jobs including security officers "health" "social professionals" "rehabilitation" "correctional officers, and administrative personnel." These jobs, therefore,

can be classified as active jobs. However, the personnel involved in lieutenant job reported low job control and high job demands probably leading to experiencing high job strain. The results of statistical test MANOVA indicated a negative and significant relationship between JDC model and job stress ($P < 0.001$, $r = -0.46$).

The cutoff point to determine the high or low JDC was moderate level of 14 (50%) and 11 (50%), respectively.

DISCUSSION

This study was aimed to investigate the relationship between job stress based on JDC model and the characteristics of the staff jobs in terms of their tasks and the hours spent on working in Ilam, one of the cities of Iran. The cutoff points for JDC determined as moderate level in this study, 14 (50%) and 11 (50%), respectively. The results, therefore, indicate that those staff working in prison relatively experiences a high level of psychological pressure due to a high level of job demands and the low amount of decision latitude that they have in the workplace. According to the fact that one of the main purposes of the current study was to evaluate the effect of working conditions in prison including working hours or tenure on JDC, here these items would be explained in terms of different prisons with almost different innate and also different job positions.

Based on the results, the level of mean job demand reported by Darehshahr prison staff was relatively higher (mean = 21.8) than those by Central prison, Dalab prison, and the juvenile correctional center which were 18.68, 19.63, and 18.05, respectively. It means that the prison staff working in Darehshahr would face with more responsibility.

As it was mentioned before, the prisoners in Darehshahr prison are attributed to some heavy crimes such as murder, assault, kidnapping, and smuggling. The staff, therefore, are working in a situation with lots of psychological pressure imposed to the personnel. Of course, the atmosphere of the prison may play a great role for the Darehshahr staff to report their job demands higher than the others. The similar results can be found in the study done by Crawley, 2004, who observed a relationship between the prison atmosphere and its interaction with the prison officers' psychological pressure leading to job stress.^[27]

Following the study hypothesis, job control was another parameter affecting occupational stress to be evaluated. The

results indicate that the lowest amount of job control on average was dedicated to the people working in Darehshahr prison (mean = 9.7). It means that the domain of making decision is possibly limited to those staff working in Darehshahr prison where psychological pressure would be emerged. Moreover, as it was mentioned before, the level of job demands also in Darehshahr prison was reported the highest. Hence, as the stressors can lead to job stress within the context of high job demand and low control, it can be inferred that the level of total psychological pressure among Darehshahr staff is likely to be higher than that of the other prisons including Dalab and Central prisons as well as the rehabilitation center. These results are conformed with the results extracted from the study done by Calnan *et al.* in 2004 on the evaluation of occupational stress in terms of job demands and decision latitude (job control) in their study, it was declared that high demands with low control are predicted to result in a high level of job strain with the following risk of psychological and physical morbidity.^[26]

This study could explain the effects of some important factors including weekly working hours and the task innate affecting job stress through investigating JDC among prison staff in Ilam. However, there were some restrictions in our study to be mentioned. First of all, as there are many people working in prison including both males and females, it was better to work on both genders not to omit an important part of the working society. However, our subjects were all men and neither evaluating the JDC among both genders nor comparing the level of leading to probable job stress between males and females could be possible. Second, our study was limited to one of the cities in Iran and to have an appropriate interpretation for all prisons staff in Iran; it should be performed in some other cities in Iran. Some future studies, therefore, are recommended to be done to cover both female and male personnel and more prison staff in Iran so that more precise results may achieve to enable researchers generalize the results to a real society with the same situation.

CONCLUSION

This study was carried out to evaluate the relationship between JDC as predictors for job stress and some of the Iranian prison personnel demographic characteristics. The level of job stress totally was high in this study. It was also found through study that the amount of job demands can play an important role on formation of job stress. Moreover, the low amount of job control can impose a situation in which working people may feel more tensed lead to job stress. Totally, according to this study, the more a job post (position) of the prison staff impose job demands, overloading, and less amount of decision-making to the staff, and the more negative factors lead to job stress are possible to be appeared. Considering the sensitivity of prison staff, more attention to the nature of their job and its psychological aspects is suggested as well as regular monitoring of their psychological health. Furthermore, investigating the role of effective individual, organizational, and environmental variables on

JDC should be investigated in future studies and job stress as a result of all these parameters should be analyzed. Moreover, the study of the relationship between organizational factors and different jobs as well as the possible link between mental and physical loads and job stress also is recommended.

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Conflicts of interest

There are no conflicts of interest.

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