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Research article

STUDY OF THE RELATIONSHIP BETWEEN WORKPLACE DESIGNING AND INDIVIDUAL EFFICIENCY AMONG THE PERSONNEL OF TEHRAN SHAHID MODARRES HOSPITAL IN 2015

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ABSTRACT

Introduction: Today, one of main priorities of managers is increasing efficiency and improvement of provided services in health and treatment domain for increasing people satisfaction. By increasing efficiency in their organizations, managers could pave the way for achieving organizational aims and the country development in health and treatment domain. Regarding the different designing of workplace and factors effective on personnel efficiency in various organizations, this study has been performed with the aim of examining the relation between workplace designing and personnel efficiency. **Materials and methods:** The present descriptive study was performed in 2015 in cross-sectional form. The study statistical population was constituted from 750 persons of Tehran Shahid Modarres hospital personnel. For collecting data, scholar- made questionnaire was used whose validity was confirmed. In this study, 107 men and 175 women randomly completed the questionnaire that totally 282 people were examined. The questionnaire validity was calculated using Cronbach alpha between 0. 691 and 0. 701. Data obtained from the questionnaire was analyzed using SPSS software and statistical analysis (variance analysis, dependent T-test, Pierson correlation test, regression). In data analysis the highest and lowest score was 1 and 5. **Results:** Findings indicate that workplace physical factor including furniture, temperature, noise and music had significant relations with efficiency and lighting and spatial arrangement didn't have any significant relation with efficiency. Generally, temperature with correlation (0. 241) had the highest impact and noise (0. 137) had the least impact on efficiency. **Conclusion:** Improvement and suitable designing of workplace leads satisfaction and increasing personnel efficiency.

Keywords: personnel efficiency, workplace, workplace designing, physical factors.

INTRODUCTION

Today in a world full of competition, the most important goal of the organizations is efficiency as a philosophy and strategy based on improvement[1]. Then, the main goal of managers is the effective and better usage of all available facilities, so in all countries better and more accurate use of all production factors has turned to a national priority. In Iran, too, attention to efficiency has an important role in development and has been determined about 3. 5% that for increasing efficiency necessary strategies should be identified[2].

Based on the view of Iran National Efficiency Organization, efficiency has a quite rational perspective to work and life which is similar to an intelligent culture for activities promotion for achieving an eminent life. The most important criterion of efficiency is individual efficiency since it is the vital element in any type of work and effort for efficiency of human resources. Alfred Marshal assigns human resources nurture as the most valuable investment[3].

Since men are the most important resource and the greatest cost for each organization, many organizations limit their efficiency to personnel skill increase. Yet, about 86% of efficiency problems are in the inhabitancy setting of the organizations[4].

Workplace plays an important role in the organization. Many problems of personnel are related to their environment. Efficiency level could be increased through development of workplace[5].

Undoubtedly, the environment conditions, equipment and instruments have a vital role in accession of internal abilities. Then, those organizations and institutes which

consider efficiency an intelligent action not working hard, for increasing efficiency proceed in creating standard means and equipment, so that the personnel step in the course of the organization objectives with mental and physical health[6].

Among important factors, which could influence the personnel efficiency, are physical conditions of workplace which includes temperature, lighting rate, amount and type of pollutant chemical materials and aesthetic aspects like walls and floor color, and existence or lack of art works, green space, ornamental objects and or music. Some personnel, when losing their concentration, use headphone for increasing concentration. For escaping from an environment which is extremely noisy or calm, biologically tonic sounds help encouraging and releasing Dopamine in the brain reward region like eating a pleasant food, looking at something attractive or a nice smell or odor[7].

Spending cost for improving workplace is one of effective ways of efficiency increase, so that a small increase in efficiency from 1 to 2% could have considerable impacts on the organization profit, so that these days organizations employ ergonomic advisors to be the personnel consulters about the method of improving their office designing. An office with comfortable designing considerably increases the personnel motivation and their efficiency since most people spend 50% of their lives in the organization internal environment. The findings of this study show that office designing is very vital in respect of increasing the personnel efficiency[4].

MATERIAL AND METHODS

This study is descriptive correlational of applied type which was conducted in Shahid Modarres hospital of Shahid Beheshti Medical Sciences University in 2015. Main objective of such studies was growth and improvement of activity, solving a problem and test in real situations. For collecting required information for codifying the study background and its theoretical fundamentals, library method and for examining the present status survey method were used. The study statistical population includes all personnel with employment statuses of contractual, conventional, experimental official and irrevocable with education degrees of below diploma, diploma, associate diploma, bachelor, master and general and specialized doctoral and all various ranks of departmental, support and research working in the hospital whose number was 750 persons.

For more validation of findings, random sampling method was used and the society people were examined. In this study, the significant relation between two types of variables was examined that they were divided to two groups of dependent and independent based on the role they had undertaken in the study which are provided in table1 and include a dependent variable and 6 independent variables. All variables were from qualitative discrete type with spatial scale, for finding important and meaningful independent variables, forward method has been used for entering the model. For measuring variables the questionnaire with 5- option Likert scale was used with range of quite agree to quite disagree. For determining and calculating reliability and consistency factor Cronbach alpha method was employed. As pretest, first the questionnaire was provided for 50 responders out of study population who were similar to study population in respect of features. Test conditions were adjusted like real conditions so that it was performed without awareness of responders about the questionnaire being experimental. All distributed questionnaires were returned and besides general reliability factor, Cronbach alpha relating to each factor was calculated that all factors were higher than 0. 7.

The present study information collecting method was constituted from two parts:

1- Library studies: for examining the research topical literature, mainly Latin and Persian books, essays and resources obtained by searching in Internet, information banks and resources and libraries were used.

2- Field /survey studies: for collecting the considered data and assessing the study variables, the questionnaire was used. 282 questionnaires were distributed among personnel of Shahid Modarres Hospital of Tehran Shahid Beheshti Medical Sciences University. From this number, 282 questionnaires were completed and collected. The rate of replication and return of questionnaires was 100% that 4 questionnaires were not completely answered.

Statistical Analysis: Data analysis, in fact, had three operational stages. In the first stage, data were prepared for test. In the second stage, the relations among variables were analyzed and in the third stage, the observed results were compared with expected results.

Table 1. The study variables

item	variable name	type			scale				its role in the research				measurement tool
		qualitative	discrete quantitative	continuous qualitative	nominal	ordinal	spatial	ratio	background	independent	dependent	other cases	
1	efficiency			*			*				*		questionnaire with Likert scale
2	lighting			*			*			*			questionnaire with Likert scale
3	temperature			*			*			*			questionnaire with Likert scale
4	spatial arrangement			*			*			*			questionnaire with Likert scale
5	furniture			*			*			*			questionnaire with Likert scale
6	noise			*			*			*			questionnaire with Likert scale
7	music			*			*			*			questionnaire with Likert scale

RESULTS

By analysis of 282 retuned questionnaires, it was specified that most responders are women 62. 1% (women were 175 and men 107) and 41. 1% of responders had bachelor's degree (116 persons) and 45. 7% of responders had a working background between 11 to 20 years (129 persons). The people age is in the range of 40 years. Its minimum rate is 20 and maximum 60 years. The individuals' average age is equal to 35. 40 with average standard error 0. 468. Also, standard deviation is 7. 801 and its variance is equal to 60. 862.

For calculating the questionnaire validation, Cronbach alpha rate was used as follows:

Table 2.

	rate
number (the number of lost data)	(7) 275
Cronbach alpha rate	0. 691
Cronbach alpha rate (based on standardized rates)	0. 701
the number of questions	28

The rate of Cronbach alpha is equal to 0. 691 that if variables are entered in standardized form. its rate increases to 0. 701. Also, if the question No. 7 is omitted from the questionnaire, Cronbach alpha increases to 0. 711.

For examining the relation between the score of furniture, temperature, lighting, space arrangement, noise, music and efficiency score, Pierson correlation test was used as follows:

		furniture score	efficiency score
furniture score	Pierson correlation p rate	1	0. 222 <0. 001
efficiency score	Pierson correlation p rate	0. 222 <0. 001	1
		temperature score	efficiency score
temperature score <0. 001	Pierson correlation p rate	0. 222 <0. 001	1
efficiency score	Pierson correlation p rate	0. 241 <0. 001	1
		lighting score	efficiency score
lighting score	Pierson correlation p rate	1	-0. 015 0. 8
efficiency score	Pierson correlation p rate	-0. 015 0. 8	1
		space arrangement score	efficiency score
space arrangement score	Pierson correlation p rate	1	-0. 005 0. 936
efficiency score	Pierson correlation p rate	-0. 005 0. 936	1
		music score	efficiency score
music score	Pierson correlation p rate	1	0. 237 <0. 001
efficiency score	Pierson correlation p rate	0. 237 <0. 001	1

There is a significant relation between efficiency score and furniture score. The above correlation has become significant in statistical respect and it rate is 0. 222.

There is a significant relation between and temperature score. The above correlation has become significant in statistical respect and its rate is equal to 0. 241.

There isn't any significant relation between the efficiency score and lighting score. The above correlation hasn't become significant in statistical respect and its rate is equal to -0. 015.

There is no significant relation between efficiency score and space arrangement score. The above correlation hasn't become significant statistically and its rate is equal to -0. 005.

There is significant relation between efficiency score and noise score. The above correlation has become statistically significant and its rate is equal to 0. 137.

There is a significant relation between efficiency score and music score. The above correlation has become significantly significant and its rate is equal to 0. 237.

DISCUSSION

Suitable designing of workplace physical factors has a significant effect on the personnel efficiency. Therefore, suitable furniture designing will cause increasing of performance and as a result, increase personnel efficiency[5]. In Shahzadi study, results showed that there is a significant relation between dependent and independent variables and conditions and factors of workplace impact personnel performance. Therefore, if a change is created in a variable, the change is created in another variable in the same direction and then correct designing of furniture impacts on the personnel efficiency[8]. Naeim Akhtar in his study affirmed that internal designing has a significant and positive impact on personnel efficiency and the results showed that comfortable furniture designing was the second factor influencing personnel efficiency and in workplace women more than men emphasize internal designing and furniture convenience[9]. Nina Monirah, also affirmed that all workplace physical factors affected personnel efficiency and there was a significant and positive relation between workplace designing and personnel efficiency. Therefore, workplace physical environment is a factor which affects personnel efficiency and the relation between furniture and personnel efficiency is significant[10]. Ger. Girpal Singh stated that dissatisfaction with workplace physical factors has an important role in personnel efficiency lost and his study results showed that there is a significant and positive relation between workplace physical factors and personnel efficiency and office designing and comfortable furniture have a considerable impact on personnel efficiency[11]. Angela Oswald study results confirmed the impact of workplace physical factors on personnel efficiency and affirmed that workplace factors such as furniture and equipment have a direct impact on health and efficiency of healthcare providers and generally workplace was the factor determining workplace efficiency level and it confirmed positive impact on efficiency[12]. Shorty SEHGAL (2012) confirmed positive impact of workplace physical factors such as furniture on increasing personnel efficiency and affirmed the significant relation between furniture convenience and personnel efficiency and furniture convenience and a good workplace has a positive impact on personnel performance and them increasing efficiency. Affirmation of Rasha Mahmoud study results was based on this concept that physical factors like furniture directly impact motivation level and performance and then personnel efficiency and there is a positive and significant relation between workplace physical factors such as furniture and then personnel efficiency and furniture was among the most effective factors on efficiency (Mahmoud, 2012). Affirmation of Ameneh Hadad (2009) study results was based on this concept that there is a significant relation between furniture and efficiency, while women staff efficiency is less affected by furniture in workplace and generally furniture is the fourth factor effective on personnel efficiency (Hameed, 2009)[23]. Affirmation of significant relation between personnel efficiency and temperature level was accomplished by Demit Leblebici (2011)[13] and he stated that temperature is one of three factors effective on efficiency (Leblebici, 2012). Consistent with the above studies, Chandrasekar (2011) confirmed that workplace temperature has a positive and significant relation with personnel efficiency and stated that very high temperature leads to heat tension and heatstroke in personnel (Chandraseaker, 2011)[14]. In this respect, in Malaysia, Jonad Esmaeel (2010) achieved similar results and confirmed a significant relation between workplace temperature and personnel efficiency and he affirmed that temperature intensity impacts personnel efficiency (Esmaeel, 2010)[15]. Ameneh Hadad research findings (2009) in Pakistan was also confirming the significant relation between temperature level and personnel efficiency and generally, temperature with average 3. 86 was the fifth factor effective on personnel efficiency (Hameed, 2009)[23]. Also, Limour Gutnick (2007)[16] in his study confirmed that there is a significant relation between workplace temperature and personnel efficiency (Gutnick, 2007). Owli Seppanen affirmed the significant relation between workplace temperature and personnel efficiency and stated that performance increases to temperature of 21-22 ˚C and with temperature higher than 23-24 ˚C decreases and the

highest efficiency occurs in temperature of 22 ˚ C (Seppanen, 2006)[17]. In Naeim Akhtar study (2014)[9] the emphasis was on this point that lighting was the third factor influencing on personnel efficiency and existence of positive relation between lighting and personnel efficiency was confirmed so that low light causes pressure to eyes and headache and it was affirmed that women more than men emphasize lighting facilities and generally lighting is one of the most important factors effective on personnel efficiency (Akhtar, 2014). Consistent with the above studies, the positive impact of lighting on personnel efficiency was affirmed in Anjela Oswald (2012) study and it was confirmed that there is a direct relation between workplace lighting and personnel efficiency, so that light and lighting quality and light adjustment could considerably lead to experience improvement and efficiency (Oswald, 2012) [12].

Amberin Saleem (2012)[18] in his study claims that lighting has a trivial impact on increasing efficiency (Saleem, 2012). Rasha Mahmoud Ali (2012) confirmed positive impact of lighting on personnel efficiency as the fourth factor with average 4. 22 and affirmed positive relation between lighting and personnel efficiency (Mahmoud, 2012)[19]. Findings of Vander Vordt (2012)[24] research affirmed the positive relation between workplace lighting and personnel efficiency and also confirmed that light and lighting adjustment without possibility of its adjustment was not important, so that lighting was confirmed as one of three factors effective on personnel efficiency (Vordt, 2011)[24]. Existence of positive relation between efficiency and lighting in the study of Demit Leblebici (2011) [13]was confirmed and he considered workplace lighting as one of the most important factors effective on efficiency. Existence of positive relation between personnel efficiency and workplace spatial arrangement with average 4. 09 was affirmed in Rasha Mohammad Ali study (2012) so that workplace arrangement was confirmed as the fifth factor effective on efficiency (Mahmoud, 2012). Convenience and arrangement of workspace in Andro Vrodt study (2011) was the most important factor effective on personnel efficiency and positive relation between efficiency and space arrangement was confirmed (Vordt, 2011)[24]. Demit Leblebici (2011)[13] confirmed the positive relation between efficiency and space arrangement in his study and showed that weak space arrangement will cause wasting of time and energy and then reduction of efficiency (Leblebici, 2012)[13]. Significant impact of workplace noise on personnel efficiency was confirmed in Ger Gipal Singh study (2013). It was confirmed that there is a significant relation between efficiency and workplace noise factor so that r = 0. 35 and on this basis, noise as an energy source causes efficiency improvement. This study showed that if workplace noise factor is suitable, the personnel will have exceptional efficiency and output (Singh, 2013). Shorti Sehgal (2012) in his study affirmed noise impact on efficiency and confirmed that there is a significant relation between noise factor and personnel efficiency and most personnel in workplace are affected by noise (Sehgal, 2012). Consistent with the above studies, Amberin Saleem (2012) in his study affirmed the significant impact of noise on personnel and confirmed that noise has a negative impact on personnel (Saleem, 2012). Hana Mistry (2015) affirmed the impact of background music on comprehension test and short term problem solving and confirmed that objectivist people performed the test considerably better along with music, comparing with subjectivist people who better did the rest in silence and also he confirmed that personality and test (silence and music) none singly had any impact on performance test results but test conditions interaction (music and silence) with personality (objectivist and subjectivist) had a significant result. Therefore, objectivist people in presence of music and subjectivist individuals in silence had better performance (Mistry, 2015)[20]. Rashel Guilt (2015) affirmed significant impact of music on personnel efficiency and confirmed that music is effective in increasing repeated works efficiency and therefore, people by listening to music do their tasks faster, like checking emails without thinking or filling a spread sheet but when they are doing some works which need more concentration, it is not so. Listening to music reduces stress and increases physical pacification and as a result the individual's efficiency is increased (Gill, 2015)[21]. Zeinolabedini states that some studies have approved that almost two third of employees and workers prefer music to be broadcasted during work and broadcasting suitable music causes working hours seem shorter and personnel stress is decreased during work, then it causes increasing of personnel efficiency. Shirin Nazerzadeh study (2011)[22] was based on this point that still scholars and psychologists couldn't find a clear answer to this question that whether the impact of broadcasting music in workplace is positive or negative. What is sure is that

every factor which causes individuals hilarity in workplace will have a positive impact on social behavior and brain ability in information process and increase people creativity and efficiency (Nazerzadeh, 2011).

The findings of this study showed that personnel efficiency is influenced with workplace physical factors and workplace suitable designing has a significant relation with personnel efficiency and workplace improvement leads to personnel satisfaction and then performance improvement. On this basis, it is suggested that:

The organizations should have continuous training programs for managers to develop a suitable workplace which leads to increasing of efficiency in the organization. Also, employing ergonomic advisors in hospitals for designing standard furniture for personnel mental and physical heath

Periodical examinations of hospital personnel are performed for diagnosing building syndrome illness (reduction of sick leave and shorter periods of disease which causes personnel efficiency increase). These advantages could economically cause saving of milliards dollars.

CONCLUSION

Suitable insulation of hospitals workplace, so that heat, cold, noise and any kind of pollution don't enter the workplace, on this basis, for reaching workplace correct insulation, double glazing doors and windows should be used and for annihilating noises, sound absorption instruments should be installed on roofs and walls so that noise to be absorbed in roofs and walls and noise intensity to be reduced.

Among limitations of this study is shortage of research in this field in health and treatment domain which shows the need to conduct such studies.

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