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Factors affecting motivation of employees in public sector in Erbil, Iraq an application of binary logistic regression

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Abstract. Motivation is a general term that refers to the needs, demands, desires, or individual's internal forces. The main objective of this study is to investigate the factors affecting job satisfaction and motivation of employees in the public sector in Erbil- Iraq. To achieve this purpose, the researcher was required to get the questionnaire filled from employees working at different organizations. Data were obtained from randomly 250 employees working at different organizations and the questionnaire was distributed in 2019. A questionnaire was designed and used to record information based on a 3-point Liker scale. Descriptive statistics and Binary Logistic regression by using SPSS program analysis used. The results indicated that some factors such as "education", "job status", "training and development", "justice" and "job security" have an impact on motivating employees.

Keywords. Employee, motivation, Public Sector, Logistic Regression, Erbil, Iraq

Introduction

The concept of motivation and its parts, which stimulate us, is the most sophisticated parts of psychology in today's management. This requires a lot of effort and research to be done. Humanitarian issues widen every day, despite the rapid advancement of technology (Egan et al., 2004). The motivation for work has occupied experts' minds widely. Research about motivation's phenomenon and its role in the person's behavior undoubtedly refers to psychological research (Bakay and Huang, 2010). There is no doubt that motivation plays a huge role in activating the outcomes and achieving goals. Therefore, managers always face the question of how to motivate employees and themselves. In every business, there are usually three partners that organizations deal with. These partners are known as shareholders, employees and customers. The leading partner that you face every day is that of your staff and nobody elsewhere (Cherry, 2015). Several years ago, attempts made to understand the main roots of managing mental change. This was for answering the puzzle of high quality at a low price. One of the interesting and new points was that the evolved industrial and management of Japan is rooted in the solving of the quality problem (Wright, 2007). The underlying problem solving and quality control, human factors are considered. From this point of view, attention should be paid to humans, and they should be handled appropriately in the workplace and industrial site. More importantly, their diversity and different opinions must be taken into consideration (Lewin et al., 2003). There is a theory which believes quality products and

services could achieve quality human. Thus, organizations and manager's efforts should initially focus on building quality humans. No attempt is going to be successful unless humanity in the workplace takes into account. Surprisingly, Japanese experts are highly experienced and qualified, still, when they ponder solving quality issues and an organization management framework, their research and academic work does not overlook human behavior (Garg and Rastogi, 2006). Human has not only to influence on industrial and commercial organizations but also considered as the main factor in developing the purposes of the organization (Licht, 2010). To increase both productivity and efficiency, factors of motivation should be known. Later on, for meeting the needs, more adequate steps must be taken. All management experts believe that motivation is the most complicated aspect of nature (Danish and Usman, 2010). This suggests that it is multidimensional. From this sense, understanding the factors requires research and the way that is managed. Information about the employee's motivation factors which results in changing the way that employees behave and react (Arnett et al., 2002). There are two job motivating factors that were seen by some researchers. These two variables are separate as an intrinsic variable and an extrinsic variable (Vandenabeele, 2009). The inherent variables contain, interesting work, promotion, feelings of involvement and career development; also, the external variables are respectable salary, job security, good working conditions and intellectual discipline (Curtis and Riva, 2009). Extrinsic according to motivation tools of extrinsic motivation is incorporates such factors which are job security, promotions, pay, the social climate and private office space (Mahaney and Lederer, 2006). Besides they include merit bonuses, pay raises competitive salaries and such devious forms of payment as compensatory time off and vacation and external to the job itself. Determinants of motivation relying on literature, the motivation's meaning for employees are comprehensible (Berman et al., 2010). The purpose of this study was to analyze the effective factors on job satisfaction and motivation of employees in the public sector in Erbil-Iraq. In the study, not only socio-demographic factors but also, the effect of some factors such as good communication between managers and employees, offering organizational and professional development courses with a variety of skills, providing educational opportunities to progress degree and achieve higher administrative authority, incentives and organizational culture, physical aspects of working conditions and reward on employees' job satisfaction and motivation will be investigated.

Methodology

To obtain the necessary data for the study, a questionnaire survey has been designed particularly for this purpose collected through the employees of province Erbil, Iraq during 2019. Therefore, the sample for the study consisted of 250 employees in the public sector. Data collected by administering the research instrument were analyzed in line with each research question and hypothesis. Descriptive statistics (such as frequencies and percentages) were used to answer the research questions. Binary logistic regression was used to analyze the hypotheses. The SPSS program was used to run all the analyses for the study.

Logistic regression analysis

In order to analyze the data, the study used logistic regression that is a statistical method that is used to analyze data. At the same time, logistic regression is very helpful in showing a binary dependent variable. Meanwhile, it is also useful in describing the association between a binary dependent variables and an independent or explanatory variable. Parameters attained for the independent variables can be used to evaluate odds ratios for each of the independent variables in the model (Long and Freese, 2006). The only difference between logistic regression and a linear regression model is in results of variables. In the former the result is binary or

dichotomous. The variance between logistic and linear regression is reflected both in the opt of a parametric model and in the expectations. This variance used to say in the analysis of logistic regression follows the same rules of linear regression analysis. For any types of regression analysis, the significant measure is the mean values of the result variable, given the values of the independent variable as:

$$E(Y/x) = \beta_0 + \beta_1 x$$

Where Y signifies the result variable, X represents a value of the independent variable, and the β_i 's symbolize the model parameters. Many distribution functions have been proposed for use in the analysis of a dichotomous outcome variable. The specific form of the logistic regression model is (Hosmer and Lemeshow, 2013):

$$\pi(X) = \frac{e^{\beta X}}{1+e^{\beta X}} = \frac{e^{\beta X}}{1+e^{\beta X}}$$

For simplifying notes, we let $\pi(X) = E(Y/X)$. The transformation of $\pi(X)$ logistic function is identified as the logistic transformation:

$$g(x) = \beta_0 + \beta_1 x$$

The significance of this transformation is that $g(X)$ has many of the needed properties of a linear regression model. The logit, $g(X)$ is linear in its parameters, may be continuous, and may range from minus infinity to positive infinity, dependent on the range of X.

The method of linear regression is mostly used to estimate unknown parameters called least squares. The values of parameters in this method select to diminish the sum of squared deviations of the experimental values of Y from the modeled values. In linear regression the method of least squares produces evaluators with a several desirable statistical properties. When the method of least squares is used to a model with a dichotomous result the estimators no longer have these same properties. The public method which leads to the squares function under the linear regression model (when the error is normally distributed) is named the maximum likelihood. This method offers the basis for assessing the parameters of a logistic regression model. A brief review of fitting the logistic regression model is given below (Hosmer and Lemeshow, 2000). It is invalid to originate the mathematical appearance of the statistic G. Instead, it should be supposed that below the null hypothesis that is β_1 equal to zero, G will follow a chi-square distribution with 1 d.f. Another test statistic, similar to G for the purpose, used in this study is known as Wald Statistic (W) which follows a standard normal distribution under the null hypothesis that $\beta_1 = 0$. This statistic is computed by distributing the assessed value of the parameter by its standard error as:

$$W = \frac{\hat{\beta}_1}{\text{Se}(\hat{\beta}_1)}$$

The likelihood ratio test is should be used in doubtful cases, it especially when Wald test fail to reject at the time when coefficient was significant. A ratio of being used for two odds is called the odds ratio (OR). The odds ratio is used to give us an idea of in what way powerfully a given variable may be linked with the result of attention compared to other variables. For a possibility of success p, the odds (likelihood) of success (in our case with cause of motivation, i.e., involved) are defined.

$$\text{odds} = \frac{\pi}{1-\pi}$$

Basically, odds are nonnegative values. While the odds are less than one, the possibility of achievement is less than that of failure; when the odds equivalent one, the probabilities of

success and failure are equally likely; and when the odds are greater than one, the probability of success is greater than that of failure (Hosmer and Lemeshow, 2000).

Results and discussion

Socio Demographic Characteristics of Respondents

The finding of the research showed that the percentage of male employees (59, 2%) is higher than in females (40, 8%). As well as, the result of marital status portrayed that, nearly 55% of the employees are married, and 45% are single (Table 1). Married employees generally have more salary and benefits than single employees. On the other hand, 20% of the staff are department managers, and 80% of respondents are working as staff employees. Besides, most of the staff employees are continuing education to getting a higher degree and participate in educational programs to have higher authority in their job. According to the result, 33% of the respondents have degrees less than a high school, while the remained 67% is occupied by the employees that have a degree of a diploma; bachelor or masters. Further, results indicated that 60.8% of the respondent's ages are less than 30 years old, and 39.2% are more than 30 years old. Moreover, the table shows that the majority of employees are between 25 to 30 years old which indicates that the youth have a very good opportunity to work in Erbil which has positive results on performance since youth are more lively, technologically educated, multi-skilled and less resistant to change (Mahmood, 2014). In addition, many employees earn a low salary, because it's not a long time they became employed. Also, a small percentage of respondents obtain a high salary because of long-time employees.

Table 1. Socio Demographic Characteristics of Respondents

Variables		Frequency	%
Gender of respondents	Male	148	59.2
	Female	102	40.8
Marital status of respondents	Single	112	44.8
	Married	138	55.2
Job status of respondents	Manager staff	50	20
	Employee staff	200	80
Education of respondents	Primary and secondary	29	11,6
	High school	53	21,2
	Diploma	52	20,8
	University	116	46,4
Age of respondents (years)	<25	43	17.2
	25-30	109	43.6
	>30	98	39.2
Household income (1000 IQD)	<500	115	46.0
	500-800	96	38.4
	>800	39	15.6

4.2. Factors Affecting Job Satisfaction and Motivation

Moreover, the result illustrated that 13.6% of the employees selected disagree and increased to 50.8% agree about "I feel that my superior always recognizes the work done by me". Employees always want their managers to officially identify their jobs. According to Table 4.2, 10.8% of the employees chosen disagree and increased to 44.8% agree about "training and development have a positive and significant effect on employee". Follow by it can find that both, learning

and making progress help employees do their jobs better. Further the result reflected that 6.8% of the employees selected disagree and increased to 60.8 % agree about "I am satisfied with the responsibility and role that I have in my work". These outcomes demonstrate that the employees are completely agreed with their roles and responsibilities. Also, 15.2% of the employees chosen disagree and increased to 45.6% agree about "do you feel justice at work". According to this output can realize that equality and justice from the managers to employees is indispensable. In addition, 11.2% of the employees chosen disagree and increased to 48.4% agree about the "working environment has a positive and significant effect on employee motivation". Then we can discover employees feel satisfied with services and the environment in the workplace. In the term of "visibility with top management is important to me", about 2.4% of the respondents chosen disagree and increased to 66.8% agree (Table 4.2). The results indicate that employees attempt and want to build good and direct relationships with their managers. Results showed that 15.2% of the employees chosen disagree and increased to 45.6% agree about "is the reward would be motivation" (Table 4.2). So, it can be realized giving rewards to employees for their efforts to increase motivation.

Table 2. Characteristics employees of Respondents

Variables		Frequency	%
Recognizes	Agree	34	13.6
	Maybe	89	35.6
	Disagree	127	50.8
Training and development	Agree	27	10.8
	Maybe	111	44.4
	Disagree	112	44.8
Responsibility	Agree	17	6.8
	Maybe	81	32.4
	Disagree	152	60.8
Justice	Agree	38	15.2
	Maybe	98	39.2
	Disagree	114	45.6
Working environment	Agree	51	20.4
	Maybe	113	45.2
	Disagree	86	34.4
Top manager	Agree	6	2.4
	Maybe	77	30.8
	Disagree	157	66.8
Reward	Agree	44	17.6
	Maybe	121	48.4
	Disagree	85	34.0

Binary logit model for social demographic characteristics

To analyze the effect of social demographic characteristics of employee on motivation and satisfaction of employees, a binary logit model was used. All variable entered to the model as dummy variables. The Nagelkerke R^2 of the model is found to be 0.305, indicating a rather strong relationship between the predictors and the prediction. Moreover, 91.3% of observations were correctly classified for the take offer group and 44.2% for the decline offer group. Overall 76.8% of the probability was correctly classified. The analyst may well need to drop

independents from the model when their impact is not significant by the Wald statistic. This is an impressive change in the 21.6% correct arrangement with the constant model so we realize that the model with indicators is a significantly better model. Regarding the results of logistic regression; there was a statistically significant relationship between motivation and job satisfaction of employees and 'education', 'job status', while did not reveal significant relation between other independent variables such as gender, age, marital status, salary and number of members in the family. Based on the statistically significant coefficient, the 'education' has a positive effect on the motivation and job satisfaction of employees. On the other hand, the results indicated that the odds ratio of education for motivating employees is 5.621. This implies that motivation and job satisfaction of higher educated employees are 5.62 times more likely to compare lower educated employees. According to the results, the 'job status' has a positive effect on the motivation and job satisfaction of employees. The odds ratio of coefficient illustrated that department managers are 4.694 times more likely to have motivation and job satisfaction compare to other employees. These results similar findings with (Faisal et al. 2015). They found a positive correlation between the education level of employees and job satisfaction. Moreover, their results indicated that motivation and job satisfaction have a high correlation with gender, hierarchy level, promotion and job security. (Manzoor, 2012) found that there is a positive relationship between employee motivation and employee recognition. Thus it is concluded that appreciation and recognition of employees' and employees' task fulfillment stimulate them towards working with more energy and dedication to the organization (Kalimullah, 2012). On the other hand, the study of (Srivastava et al. 2012) showed a positive relationship between employee empowerment and employee motivation towards organizational tasks.

Table 3. Binary logit model for social demographic characteristics of employee

Variables	Coefficient	Standard Error	Wald Test	P-value	Odds Ratio
Gender	-0.152	0.336	0.204	0.651	0.859
Age	0.018	0.031	0.339	0.560	1.018
Education	1.727***	0.476	13.162	0.000	5.621
Marital status	0.360	0.380	0.899	0.343	1.434
Number of member in family	0.174	0.110	2.512	0.113	1.190
Job status	1.529***	0.375	16.650	0.000	4.615
Salary	0.000	0.000	0.004	0.950	1.000
Constant	-3.976***	1.219	10.638	0.001	0.019
-2 log likelihood	247.886				
Nagelkerke R ²	0.305				
χ^2 (p: value)	60.859 (0.000)				

Note: ***, **and* indicate significance levels at 1%, 5% and 10% respectively

Binary logit model for employee characteristics

To analyze the effect of employee characteristics on motivation and satisfaction of employees, a binary logit model was used. All variable entered to the model as dummy variables. The

Nagelkerke R^2 variation is 0.434, indicating a rather strong relationship (43.4%) between the predictors and the prediction. Overall, 76.8% were correctly classified. So, we realize that the model with indicators is a significantly better model. According to the results of logistic regression; there was a statistically significant relationship between motivation and visibility, mission, results are expected, the chance to practice. While other independent variables did not reveal significant relations. According to the statistically significant coefficient, individuals who state that senior management and visibility are important are 3.18 times more likely to involve in motivation and job satisfaction than others. Similarly, employees who indicate that the mission or purpose of an organization makes employees feel their job is important to have been 2.94 times more satisfaction and motivation than others. Based on the statistically significant coefficient, the expected results have a positive effect on the motivation and job satisfaction of employees with the odds of 5.50. The output of the statistically significant coefficient represented that chance to practice and learn at work has a negative effect on the motivation and job satisfaction of employees. On the other hand, the odds ratio indicated that employees agree with the statement “there is a chance to practice and learn at work” are 0.25 times less likely to involve motivation and job satisfaction. In similar research, (Top 2012) stated that the attitude and role of top management are significant factors in the effectiveness of sharing information and knowledge. Moreover, the author indicated that there is a high correlation between top management perceptions and visions of knowledge and strategy. On the other hand, (Shrivastava and Purang, 2009) stated that some factors including feedback system, task derivative, pecuniary agreements, growth latitude, reward and recognition agreement, punitive agreement, innovation reinforcement, empowerment accepting culture have a significant effect on the employee motivation from the appraisal.

Table 4. Results of the logistic regression model for employee characteristics

Variables	Coefficient	Sta. Error	Wald Test	P-value	Odd Ratio
Recognizes	-0.477	0.549	0.753	0.385	0.621
Training and development	1.001***	0.454	4.860	0.027	2.721
Responsibility	0.037	0.144	0.066	0.798	1.037
Justice	1.814***	0.447	16.489	0.000	6.136
Working environment	-0.163	0.480	0.115	0.734	0.850
Job security	-1.443***	0.455	10.049	0.002	0.236
Constant	-1.296	1.041	1.552	0.213	0.274
-2 log likelihood	216.700				
Nagelkerke R^2	0.434				
χ^2 (p:value)	92.046 (0.000)				

Note: ***, **and* indicate significance levels at 1%, 5% and 10% respectively

†: All variable entered to the model as dummy variables

Conclusion

The concept of motivation and its parts, which stimulate us, are the most sophisticated parts of psychology and today management. This requires a lot of efforts and research to be done. Humanitarian issues widen every day, despite the rapid advancement of technology. The motivation for work occupies expert mindset widely. Analysis about motivation phenomenon and its role in person behavior undoubtedly refers to psychological research. This research aims to determine the identification of the reasons that cause job satisfaction and motivation of

employees in Erbil-Iraq. These resources consist of effective capabilities and abilities which they turn into the workforce in the workplace. In order to achieve the goal of each research, the researcher should have to look at on their own aims of their study. The first descriptive of socio-demographic characteristics of employees and information taken from the variable independent by researchers. Meanwhile, it then looks to clarify the impacts of the variables that have examined the study on severity of motivation employees. The empirical results showed that education, job status, job security, training and development, justice, are the significant factors on motivation of employees. In the present research, job status more likely to involve in job satisfaction and motivation. Therefore, results are expected of me more likely to involve motivation employees. The results show top management more likely to involve motivating employees. Eventually, the chance to practice less likely to involve motivation employees. In conclusion, the expectancy theory is the root of all variances of motivation for employees in the workplace. Everyone needs to be motivated to perform better whatever their current situation may be and this is directly related to what they expect to receive in return for their efforts.

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