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FACTORS INFLUENCING THE PERFORMANCE APPRAISAL SYSTEM AMONG WOMEN AND MEN: A COMPARATIVE ANALYSIS USING MULTINOMIAL LOGISTIC REGRESSION APPROACH

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ABSTRACT

In our research outcome we presented the results of a comparative analysis among men and women on the employee factors influencing the evaluation performance appraisal system using Multinomial Regression Analysis with reference to Agriculture Research Sector employees in Hyderabad Metro, India. The primary data collected from the performance appraisal forms of 400 employees including 300 Men and 100 Women, working in the agriculture research institutes in and around Hyderabad. The seven independent factors Job Knowledge, Skill Level, Job Execution, Initiative, Client Orientation, Team Work, Compliance to Policies and Practices, and one dependent factor, the final outcome of the Performance Appraisal System the Rating measured. The descriptive analysis, and Multinomial Logistic Regression analysis carried out to arrive at the conclusions. To measure the reliability of the instrument used for this study and internal consistencies the reliability statistics Cronbach's alpha (C-Alpha) was estimated. The overall C-Alpha value for men measured at 0.91 and 0.94 for women, and the C-Alpha values for all the factors ranged 0.84 to 0.85 for men and 0.79 to 0.90 for women. The overall Spearman Brown Split-half reliability measured at 0.88 and 0.86 for men and women respectively. The multinomial logistic regression analysis was performed to estimate the likelyhood odds ratios (ORs) to explain the factors associated outcome of the performance appraisal system Rating, a dependent variable. It can be observed from the relative log odds ratios of Women that significant negative influence of all the independent variables, except Client Orientation at 95% CI level for the dependent variable Rating outcome Good and Excellent versus Outstanding. In case of Men all the independent factors negatively contributing for this model for performance appraisal outcome Rating Good, Excellent vs Outstanding. This was explained in detail in the Results section of the paper.

Key words: Multinomial Logistic Regression, C-Alpha; Tem Work, Performance Appraisal, Policies, Reliability.

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1. INTRODUCTION

Performance appraisal (PA) is a formal system of review and evaluation of an individual or performance and peers will be reviewing an individual's performance on a continuing basis. The Performance Appraisal System (PAS) a development tool used to measure the actual performance in an organization and the strategic goals of the organization are aligned to that of individual performance. Using Performance Appraisal System an employee's performance is measured against core competencies such as Job knowledge, Skill level, Job execution, Initiative, Client orientation, Cooperation and ability work effectively, Quality and quantity of output, Leadership qualities, and Compliance to policies and practices including safety and environment, Efficient handling of available resources, Intuitiveness to take new assignments and learn new things, etc. However the core competencies will vary from organization to organizations depending on its objectives, business strategies, and mission.

The performance management is an extensive, methodical, sequential and continuous process that involves performance mapping processes and sequences (Garvin 1998). Organizations that emphasize accountability tend to use performance targets, but too much emphasis on "hard" targets can potentially have dysfunctional consequences. In general most of the organizations include the performance appraisal system under Performance Management system on yearly basis, where supervisor/subordinate interview with a standard performance appraisal form with the factors to be appraised or listed in the form (Dargam 2009). The performance management provides more opportunities for individuals to discuss their work with their managers in an attractive atmosphere (Armstrong, 1991). Performance Appraisal system is a continuous process and a natural aspect of management and assess performance by reference to agreed objectives. Performance management gives direction to the employees through guidance from management (Medlin 2013). Managing organisations is about managing performance of people who work in organisations. The human resources managers believe that PAS is a good tool for performance improvement Longenecker and Goff (1992), if well designed and implemented it can benefit both the employees and the organizations (Coens and Jenkins, 2000). DeNisis and Pritchard (2006) aver that attitudes toward performance management affect the performance of employees in organisations.

1.1. Importance of Performance Appraisal in Agricultural Research Sector

The main objective of PAS in Agricultural Research Center is to improve employee and increase the potential of a researcher in performance. Though the PAS can cause some dissatisfaction over how the employee as appraised, still it can help to achieve organization's vision and mission. PAS one of the human resources valuable functional area which is helpful in correcting the deviations/errors in employee performance.

At the Agricultural Research Sector PAS being effectively used for Human Resource Planning In assessing a list of staff to be promoted, to identify the underperformed employees who need a corrective action. PAS also a useful tool for succession planning and provides a profile for the agricultural research sector organizations strengths and weakness. The PAS evaluations ratings will be used for Recruitment and Selection at the next level. The ratings will provide a benchmarks for evaluating internal applicant responses obtained through interviews. The PAS will be used to identify the Training and Development needs of the sector by identifying the employee deficiencies in those core competencies that effect the outcome of the performance. The PAS system is helpful for career planning, compensation program, succession planning and human resources development.

2. REVIEW OF LITERATURE

Performance appraisal is an unpleasant management practice. With so much controversy in it, appraisal is continually used in the public sector around the world as an instrument to oversee the performance of its personnel (Vallance, 1999). Researchers suggested to have an effective human resource system for organizations the use of an appraisal system which is reliable and accurate for employee assessment and organisational development (Armstrong, 2003; Bohlander & Snell, 2004; Desler, 2008).

George Ndemo Ochoti et al. (2012) studied the Factors Influencing Employee Performance Appraisal System: A Case of the Ministry of State for Provincial Administration & Internal Security, Kenya. Performance Appraisal system is a good tool for human resource management and performance improvement (Longenecker and Goff, 1992). Involving the employees to understand organizational goals, what is expected of them and what they will expect for achieving their performance goal will help in organizational development (Bertone et al. 1998). PAS should also link individual performance with reward management (Townley, 1999). Linking performance with reward increases the levels of performances and should be used in both public and private sectors (Armstrong & Brown, 2005).

Feedback is an important factor of PAS and the rates should be given feedback on their competence and overall progress (Longenecker 1997). The 360 degree feedback method can be utilized by organizations as this method combines evaluations from various sources into over all appraisal (Garavan et al. 1997). Performance ratings are based on rater evaluations which are subject to human judgements and biasedness. Personal factors and prejudices are like to influence ratings (Cleveland and Murphy, 1992). The interpersonal factors are important to the PAS as they influence the outcome of the interactions (Greenberg (1993). The employee attitude toward the system is strongly linked to satisfaction with the system. The perceptions of fairness of the system are an important aspect that contributes to its effectiveness (Boswell and Boudreau, 2000). Understanding the employee's attitude and behaviour about the PAS in organizations is important as they are key to determine the effectiveness (McDawall & Fletcher, 2004). Zakaria et al. (2012) reported that (HRM practices can develop the performance of an organisation by contributing to employee satisfaction. The performance appraisal is arguably one of the more critical factor in terms of organisation performance and appears to be an indispensable part of any HRM system when compared among the HR practices studied (Shrivastava & Purang, 2011).

Yee and Chen 2009 applied fuzzy set theory in the multi-criteria performance appraisal system and developed a performance appraisal system utilizing the performance appraisal criteria from an Information and Communication Technology based company in Malaysia. This system uses multifactorial evaluation model in assisting high-level management and following a systemic approach for assessing the employee performance.

2.1. Logistic Regression

The natural logarithm logit of an odds ratio is the main mathematical concept that underlies logistic regression. The logistic regression used for testing hypothesis about a relationship between categorical outcome variable and one more categorical or continuous predictor variables (Peng et al. 2002). In linear and multiple regression models sometimes the ordinary scatterplots are curved at the end with S-Shape and is difficult to interpret because the extremes do not follow the linear trend and errors are neither normally distributed nor constant across entire range of data (Peng, Manz, & Keck, 2001). A researcher can overcome this problem from logistic regression applying logit transformation to the dependent variable. In the essence logistic model predicts the logit, the natural algorithm of response variable (dependent) over continuous variable (independent). The simple form of logistic regression adopted from (Peng et al. 2002) is:

$$\text{Logit}(Y) = \textit{natural}\log(\text{odds}) = \ln\left(\frac{\pi}{1-\pi}\right) = \alpha + ßX$$

Where ß is the regression coefficient; π = Probability(Y=outcome of interest|X=x and α is the Y intercept and this can be extended to the multiple predictors the equation is:

Logit(Y) = *natural*log(odds) = $\ln\left(\frac{\pi}{1-\pi}\right)$= $\alpha + ß_1X_1 + ß_2X_{2+} + ß_3X_{3+} + \ldots$.

Where ßs are regression coefficients, Xs are set of predictors. The αs and ßs are typically estimated by the Maximum Likelyhood (ML) method which is preferred over the weighed least squares method (Haberman, 1978 Schlesselman, 1982)

2.2. Multinomial Logistic Regression

The multinomial logistic regression is an extension of simple logistic regression that generalized to multi class problems such as with more than two possible discrete outcomes. Using this model one can predict the probabilities of the different possible outcomes of a categorically distributed dependent variable or response variable and a set of independent variables which may be continuous, binary or categorical. Using multinomial regression the dependent variable in question is a nominal where more there are more than two categories (Suryanwanshi et al. 2015). The nominal outcome variables using multinomial logistic regression are modelled in which the log odds of the outcomes are modelled as linear combination of the predictor variables (Suryanwanshi et al. 2015). Sudhir Chandra Das (2016) in his study reported the results on predictors of work-family conflict and employee engagement among employees in Indian Insurance Companies applying multinomial logistic regression analysis. Several researchers (Suryavanshi et al. 2015; Sateeshkumar and Madhu, 2012; Stephen, 2014; Masoud Lotfizadeh 2014) reported their results on occupation stress and associated factors using multinomial logistic regression. However the authors not come across any literature using multinomial regression in PAS and attempted to use multinomial logistic regression method for evaluating the factors of PAS using agricultural sector data.

3. OBJECTIVES OF THE STUDY AND HYPOTHESES

The objective of the study is to present the main factors influence the PAS system in the agriculture sector institute employees;

- To identify the factors that influence PAS at the workplace of Agriculture Research Sector employee
- To identify whether there are any significant mean differences in the above said factors in influencing the PAS among men and women

3.1. Research question

- Does there were any differences in the factors that influence the Performance Appraisal System
- Does the seven independent factors Job knowledge, Skill level, Job execution, Initiative, Client Orientation, Team Work, Compliance to Policies and Practices one dependent factor differ significantly among men and women on the outcome of PAS Rating?

3.2. Hypotheses

Based on the identified problem, research question and the objectives the following hypotheses were formed:

- **H_0:** There are no significant differences among factors that influence the PAS
- **H_A**: There are significant differences among the factors that influence the PAS
- **H_1:** There are no significant differences among factors among the Men and Women that influence the PAS
- **H_{1A}**: There are significant differences among the factors among the Men and Women that influence the PAS

4. RESEARCH METHODOLOGY

4.1. Conceptual Framework

The proposed framework was adopted based on the past research by George Ndemo Ochoti et. al. (2012). The factors under the study have been represented diagrammatically to show the relationship between independent factors and dependent factors (Figure 1).

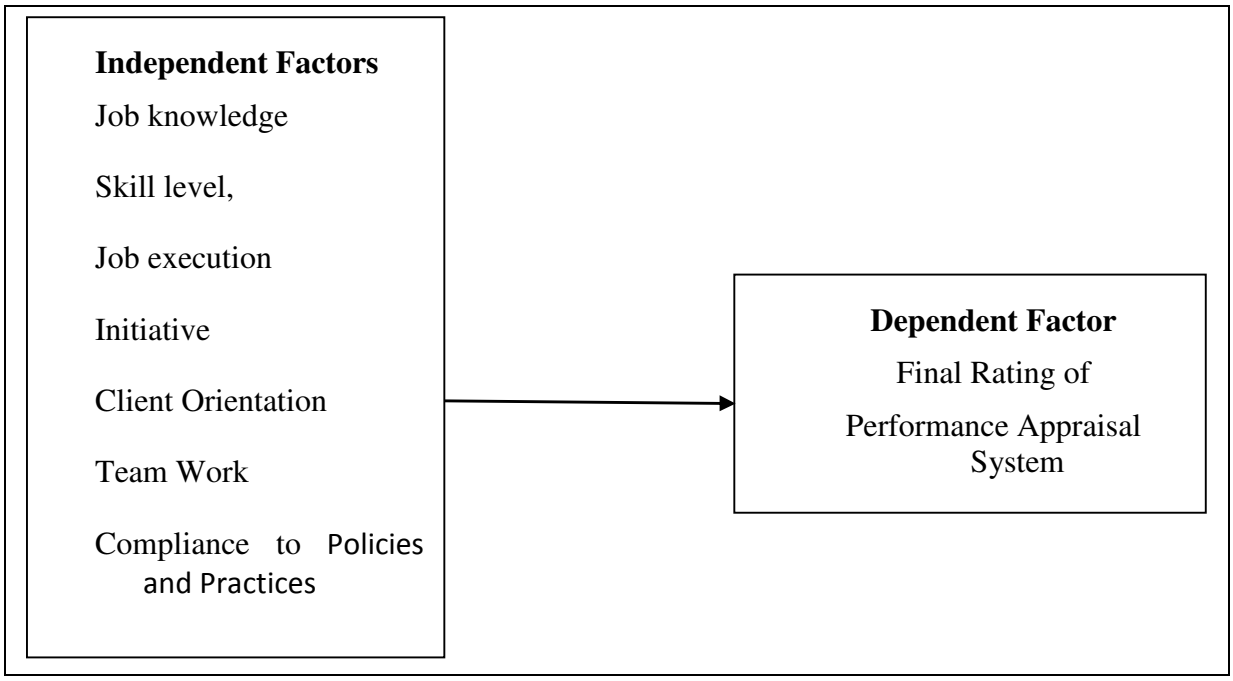

Figure 1 Conceptual Framework

4.2. Data Collection

Gender	Frequency	Percent
Men	**300**	**75**
Age:		
20-29	73	25
30-34	92	30
35-39	64	22
>40	71	23
Women	100	25
Age:		
20-29	25	25
30-34	28	28
35-39	24	24
>40	23	23
Total	400	100
Source: Primary data		

Table 1 Demography of the research Sample

4.3. Research Instrument

The research instrument used for the survey is a standardized, structured undisguised performance appraisal form a main source for the primary data collection. Secondary data was collected from various published books, websites and records pertaining to the topic. The form was divided into 2 sections. In the Section I, background information/personal such as employee name, designation, institute/organization, program, date of joining and other details of the employee were readily available (pre-filled). The Section II of the form, the appraisal section where seven core competencies – the factors Job knowledge, Skill level, Job execution, Initiative, Client Orientation, Team Work, Compliance to Policies and Practices one dependent factor

outcome of the Performance Appraisal System (PAS) the Rating was used to find out the PAS performance levels of the employees and impact of the PAS. This part contains 45 factors related to seven independent factors and one dependant factor effecting the PAS, as described earlier. The data was keyed from in Excel Sheet and the factors related to PAS was presented in (Table - 2). The researcher has identified 45 factors that affect PAS system of employees. The factor analysis was used to reduce the factors to 8 factors with the help of SPSS Version 24 (Table-2).

Factor	Description	Factors
1	Job knowledge	5 factors such as responsibilities, duties, understanding of job, requirements etc.
2	Skill level	5 factors skill to perform the assigned job, acumen, basic knowledge, new ideas, computers, etc
3	Job execution	5 factors executes the job with perfection, use of resources, effective use of time, handling of unusual situation, etc
4	Initiative	5 factors develops new avenues skills, works independently with minimum supervision, demonstrates interest, follows instructions.
5	Client Orientation	5 Handling of colleagues, understands the instruction well, implementation of project, etc
6	Cooperation and ability work in teams	5 factors, can work with the team, rapport with co-workers, inter personal relations, behaviour with colleagues
7	Compliance to policies and practices	5 factors understanding of internal procedures, practices, responsibilities, loyalty etc,
8	Overall Rating	10 Overall performance: leadership, communication skills, execution of job, effective use of available resources, wastage management, time management, reporting etc.

Table 2 Independent factors and causing effect on Performance Management System

4.4. Data Analysis

We have used descriptive statistics to summarise the data, and to investigate the survey questionnaire, formulating the hypotheses and the inferential statistics were employed and followed reliability methods. To measure the central tendency such as means, and standard deviation, we used the dispersion methods.

4.5. Reliability Methods

To measure the internal consistency, reliability of our research instrument, the survey questionnaire, and to maintain similar and consistent results for different items with the same research instrument, we used the reliability methods Cronbach's alpha. The Cronbach alpha is an index of reliability that may be thought of as the mean of all possible split-half co-efficient corrected by Spearman-Brown formula (Cronbach, 1951) and subsequently elaborated by others (Novic & Lews, 1967; Kaiser & Michael, 1975). The estimated values of the Cronbach's alpha are indicated in Table-2. The Statistical Package for Social Sciences (SPSS ver. 24) was used to measure the central tendency, measures of variability, reliability statistics, and to predict the dependent factor PAS based on independent factors the multinomial logistic regression analysis carried out (IBM SPSS Statistics, 2016).

Formula for Cronbach's Alpha (C-alpha can vary between 0.00 and 1.00)

$$r_{\alpha}\left(\frac{N}{N-1}\right)\left(1-\frac{\Sigma\sigma_j^2}{\sigma^2}\right)$$

Where r_{α} is coefficient alpha; N is the no of items; σ^2 variance of items

$\Sigma\sigma_j^2$ is sum of variances of all items and σ_j^2 is the variance of the total test scores

4.6. Reliability Test of the Questionnaire

The outcome of the PAS Rating was measured using a Likert-type scale with items 1-5 was used (where 1=Unsatisfactory, 2=Satisfactory, 3=Good, 4=Excellent and 5 =Outstanding) in this study. The reliability statistic Cronbach's alpha coefficient value (C-alpha) was calculated to test the internal consistency of the instrument (appraisal form in this study), by determining how all items in the instrument related to the total instrument (Gay, Mills, & Airasian, 2006). This instrument was tested with the data of 50 employees and using SPSS the Cronbach alpha static was measured at 0.78, suggesting a strong internal consistency. Three months later, keying data for all the 400 employees the overall C-alpha measured at 0.89 and it ranged from .0.80 to 0.88 for the 7 independent and 1 dependent factors (Table-3).

Sl. No	Factor	Cronbach's alpha	
		Men	**Women**
	Overall	0.91	0.94
1	Job knowledge	0.84	0.88
2	Skill level	0.84	0.90
3	Job Execution	0.85	0.84
4	Initiative	0.85	0.79
5	Client Orientation	0.84	0.86
6	Cooperation and ability to work in teams	0.84	0.86
7	Compliance to policies and practices including safety and environment	0.84	0.88
8	Final Rating	0.85	0.89
Overall: Spearman-Brown Split-half statistic: 0.88; 0.86 Spearman-Brown Prophecy: 0.90; 0.92			

Table 3 Cronbach's alpha values for factors used in this study

The second reliability method Split-half reliability in which scores from the two halves of a test (e.g. even items versus odd items) are correlated with one another and the correlation is then adjusted for test length. The Spearman-Brown's formula is employed enabling correlation as if each part were full length the value is measured 0.84 using formula and the Spearman Brown Prophecy was measured at 0.91

R = (2rhh)/(1+rhh) where rhh is the correlation between two halves.

The calculated Mean, Standard Deviation and Standard Error Values for men and women, for the primary data collected from the respondents (n=300, men and n=100, women) are presented in the Table-3. The estimate overall SE of 0.04 is relatively small, indicating that the means are relatively close to the true mean of the overall population (Table 4).

Factor	Mean	SD	SE
Job knowledge			
Men	3.99	0.84	0.05
Women	3.87	0.76	0.07
Skill level			
Men	3.90	0.89	0.05
Women	3.900	0.71	0.07
Job Execution			
Men	4.07	0.85	0.05
Women	3.93	0.84	0.08
Initiative			
Men	3.78	0.86	0.04
Women	3.73	0.95	0.09
Client Orientation			
Men	3.76	0.86	0.04
Women	3.76	0.82	0.08
Cooperation and ability to work in teams			
Men	4.02	0.86	0.04
Women	3.91	0.80	0.08
Compliance to policies and practices including safety and environment			
Men	3.98	0.81	0.04
Women	3.81	0.77	0.07
Final Rating			
Men	3.90	0.88	0.05
Women	3.79	0.74	0.07
Overall			
Men	3.82	8.79	0.05
Women	3.81	0.73	0.07

Table 4 Mean, Standard Deviation and Standard Error of Mean of the primary data of independent and dependent factors (Men and Women)

5. RESULTS

5.1. The Results of Multinomial Regression Analysis

In our study the categorical variable (termed as Response variable in SPSS, this is a dependent variable) is Rating and Gender is (Termed as Factor in SPSS) and seven independent variables as said above (Termed as Covariates in SPSS package can be continuous or categorical). To test the effectiveness of the model – how independent factors effecting the outcome of the response factor (Rating) we have evaluated our results on a) overall effectiveness of model, b) statistical tests of individual predictors, c) Goodness-of-fit statistics and validation of predicted probabilities.

Overall model evaluation: The model we have used is an improved model when compared with the intercept only model (null model with no predictors). The Table-5 shows the significance of the log likelihood of 7 independent variables for both the women and men. The log likelihood with no independent variables with only intercept with value (205.363 and 639.729, for women and men respectively) and the final model log likelihood values (68.099 and 274.588 for women and men) and with the values of likelihood ratio score, Wald Statistic make model more significant and improved over the null model. Further the significance level of the test is less than 0.05, we can conclude that the Final mode is outperforming the Null.

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	Df	Sig.
Women				
Intercept Only	205.363			
Final	68.099	137.264	14	.000
Men				
Intercept Only	639.729			
Final	274.588	365.141	14	.000

Table 5 Model Fitting Information

Statistical tests of individual predictors: The statistical significance of individual regression coefficients (i.e. ßs or Exp(ß) tested using Wald chi-square statistic Table-6 and Tables 10 and 11. From the values of Table-7 and Table-11 all the independent factors Job Knowledge, Job skill, Job execution, Initiative, Team work, Compliance to policies for both Women and Men make the model significant. The client orientation and Gender are insignificant for this model as more or less the results are similar among Women and men (Tables 10 and 11).

Goodness-of-fit statistics: To assess the model used in the study against the actual outcomes (i.e. independent factors influencing the outcome of the PAS Rating). In this model the Chi-square value for both the cases has found to be significant. It can be observed from the Table-6 that the model adequately fits the data. If the null is true, the Pearson and deviance statistics have chi-square distributions with the degrees of freedom displayed.

	Chi-Square	df	Sig.
Women			
Pearson	87.543	132	.999
Deviance	63.940	132	1.000
Male			
Pearson	118419.257	350	.000
Deviance	264.329	350	1.000

Table 6 Goodness-of-Fit

The three additional descriptive measures for goodness-of-fit and estimating the strength the multinomial logistic regression relationship are R^2 indices (Table-7) defined by Cox and Snell (1989) and Nagelkerke (1991). In linear regression it is the proportion of variation in the dependent variable that can be explained by predictors in the model. Attempts have been made to yield an equivalent of this concept for the logistic model. The values of (0.747, 0.704 Cox and Snell; 0.8514, 0.793 Nagelkerke; and 0.655 and 0.556 (McFadden, 1975) for women and men have been used. Tabatchnick and Fidell (2007) suggest that it approximates the same variance as in linear regression interpretation as R^2 and based on the log likelihood for the model compared to the log likelihood for a baseline model. With the categorical outcomes it has a maximum value of less than 1. Nagelkerke's R^2 is the adjusted version of the Cox & Snell R^2 that adjusts the scale of statistic to cover the full range from 0 to 1. McFadden R^2 is based on log-likelihood kernels for the intercept–only model and the full estimated model. The value of 0.558 is significant (Hensher & Johnson, 1981). Furthermore none corresponds to predictive efficiency of it can be tested in an inferential framework (Menard, 1995 & 2000). Therefore we can treat this as supplementary to other evaluations.

Women	
Cox and Snell	.747
Nagelkerke	.851
McFadden	.655
Men	
Cox and Snell	.704
Nagelkerke	.793
McFadden	.556

Table 7 Pseudo R-Square

Validation of predicted likelihood ration: The likelihood rations checks the contribution of effect on the model. Here, Job skill, Job execution, and Compliance to policies make model significant for both women and men influencing the outcome final Rating (Table 8).

Effect	**Model Fitting Criteria**		**Likelihood Ratio Tests**	
	-2 Log Likelihood of Reduced Model	**Chi-Square**	**df**	**Sig.**
Women				
Intercept	68.099[a]	.000	0	.
Job Knowledge	81.222	13.123	2	.001
Job Skill	75.440	7.341	2	.025
Job Execution	78.364	10.265	2	.006
Initiative	68.455	.356	2	.837
Client Orientation	68.256	.157	2	.925
Team work	70.298	2.199	2	.333
Compliance to policeis	74.256	6.157	2	.046
Gender	68.099[a]	.000	0	.
Men				
Intercept	274.588[a]	.000	0	.
Job Knowledge	275.941	1.352	2	.509
Job Skill	305.505	30.917	2	.000
Job Execution	305.618	31.030	2	.000
Initiative	289.084	14.496	2	.001
Client Orientation	277.442	2.854	2	.240
Team work	289.621	15.033	2	.001
Compliance to policeis	299.117	24.529	2	.000
Gender	274.588[a]	.000	0	.

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

[a]This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom

Table 8 Likelyhood Ratio Tests

The classification table (Table-9) documents the validity of predicted probabilities. The first three rows represent three possible outcomes of the multinomial logistic regression model. For each case predicted response category is chosen by selecting the category with the highest model-predicted probability. In this model for women 81% of the cases are classified as correctly when compared to men 82%. The classification table is most appropriate when a classification is a stated goal of the analysis, else it should only a supplement more rigorous method of assessment of fit (Hosmer & Lemeshow, 2000).

	Predicted			
Observed	**EXCELLENT**	**GOOD**	**OUTSTANDING**	**Percent Correct**
Women				
EXCELLENT	34	6	0	85.0%
GOOD	7	30	4	73.2%
OUTSTANDING	0	2	17	89.5%
Overall Percentage	41.0%	38.0%	21.0%	81.0%
Men				
EXCELLENT	81	19	3	78.6%
GOOD	17	84	9	76.4%
OUTSTANDING	1	5	81	93.1%
Overall Percentage	33.0%	36.0%	31.0%	82.0%

Table 9 The Observed and Predicted frequencies for the model

The parameter estimates from Tables 10 and 11 summarizes the effect of each predictor. Wald test evaluates whether or not the independent variable is statistically significant in differentiating between two groups in each of embedded in multinomial logistic comparisons. A Wald test calculates a Z statistic, which is ratio of the coefficient ß to its Standard error and the resultant Z is squared to yield Wald Statistic.

Wald Statistic $Z = \frac{ß}{SE}$

The results from the Table-9 indicate there is a statistically significant relationship between independent variables Job skill, Job Execution, Initiative Tem work, Compliance to policies when compared with Excellent and Good Ratings versus Outstanding a reference category. Menard (1995) warns that for large coefficients, standard error is inflated, lowering the Wald statistic (chi-square) value. Agresti (1996) states that the likelihood-ratio test is more reliable for small sample sizes than the Wald test.

The parameters with significant negative coefficients decrease the likelihood of response category (i.e dependent variable with respect to the reference category. In case of Women, from the Table 10 It can be observed from the relative log odds ratios significant negative influence of independent variables at 95% CI level, Job Knowledge (OR, 0.08, 0.000-0.225) Job skill (OR 0.023, 0.001-0.687), Job execution (OR 0.05,0.00-0.310), Compliance to Policies and Practices (OR 0.032, 0.001-0.744) for dependent variable Rating Good verses Excellent and similar results are observed for the dependent variable good Rating and Outstanding. The ß is the regression coefficient and e=2.71828 (the base of the natural logarithm) and the results are expressed in natural logarithm of an odds ratio. This indicates for each unit decrease in the performance of dependent variable Job skill, the odds of being decrease in Rating Excellent from 1 to 0.008($=e^{-4.775} = 2.71828^{-4.775}$) and 1 to 0.029 ($e^{-3.527} = 2.71828^{-3.527}$) to Rating Good versus Outstanding as reference category. Similarly for each unit increase in the performance of Client Orientation, likely odds of being increase in Rating Excellent from 1 to 1.510 ($=2.71828^{0.412}$) Rating Good versus Outstanding as reference category, and so on.

In case of men It can be observed from the relative log odds ratios significant negative influence of independent variables at 95% CI level, Job Knowledge (OR, 0.542, 0.202-2.044) Job skill (OR 0.058, 0.019-0.180), Job execution (OR 0.043, 0.12-0.117, Team Work (0.145, 0.051-0.414) and Compliance to Policies

and Practices (OR 0.093, 0.033-0.261) for dependent variable Rating Good verses Excellent and similar results are observed for the dependent variable good Rating and Outstanding. This indicates for each unit decrease in the performance of dependent variable Job skill, the odds of being decrease in Rating Excellent from 1 to 0.058(=$e^{-2.850}$ = $2.71828^{-2.850}$) and 1 to 0.128 ($e^{-2.054}$ = $2.71828^{-2.051}$) to Rating Good versus Outstanding as reference category and so on (Table 11).

We have observed that Job Skill, Job Execution, Initiative and Compliance to Policies and Practices significant influence on final outcome of the performance appraisal final Rating among both the Women and Men. However there are very minor differences when compared with the ratings Good vs Excellent and Outstanding among both Women and men. Therefore both the null hypotheses **H_0:** There are no significant differences among factors that influence the PAS and **H_{10}:** There are no significant differences among factors among the Men and Women that influence the PAS are accepted.

Rating[a] **WOMEN**		**ß**	**Std. Error**	**Wald Statistic**	**df**	**Sig.**	**Exp(ß)**	**95% Confidence Interval for Exp(ß)**	
								Lower Bound	**Upper Bound**
EXCELLENT	Intercept	85.826	24.686	12.088	1	.001			
	Job Knowledge	-4.775	1.676	8.116	1	.004	.008	.000	.225
	Skill Level	-3.775	1.735	4.736	1	.030	.023	.001	.687
	Job Execution	-5.305	2.109	6.326	1	.012	.005	0.000	.310
	Initiative	-.750	1.414	.281	1	.596	.472	.030	7.543
	Client Orientation	.255	1.490	.029	1	.864	1.290	.070	23.951
	Team Work	-2.088	1.541	1.837	1	.175	.124	.006	2.539
	Compliance to Policies	-3.434	1.601	4.599	1	.032	.032	.001	.744
	[Gender=F]	0[b]	.	.	0	.	.	.	.
GOOD	Intercept	65.913	24.247	7.390	1	.007			
	Job Knowledge	-2.983	1.514	3.883	1	.049	.051	.003	.984
	Skill Level	-3.527	1.605	4.829	1	.028	.029	.001	.683
	Job Execution	-3.964	1.988	3.977	1	.046	.019	.000	.934
	Initiative	-.443	1.263	.123	1	.726	.642	.054	7.637
	Client Orientation	.412	1.360	.092	1	.762	1.510	.105	21.702
	Team Work	-1.692	1.425	1.410	1	.235	.184	.011	3.007
	Compliance to Policies	-2.296	1.445	2.526	1	.112	.101	.006	1.708
	[Gender=F]	0[b]	.	.	0	.	.	.	.
a. The reference category is: OUTSTANDING; b. This parameter is set to zero because it is redundant.									

Table 10 Predicted probabilities from Multinomial Logistic Regression of the influence of seven independent factors on dependent factor Rating (Odds Ratios and 95% CI for Exp(ß)

Rating[a] MEN		ß	Std. Error	Wald Statistic	df	Sig.	Exp(ß)	95% Confidence Interval for Exp(ß)	
								Lower Bound	Upper Bound
EXCELLENT	Intercept	56.822	6.967	66.523	1	.000			
	Job Knowledge	-.443	.591	.563	1	.453	.642	.202	2.044
	Skill Level	-2.850	.579	24.228	1	.000	.058	.019	.180
	Job Execution	-3.156	.631	24.983	1	.000	.043	.012	.147
	Initiative	-2.023	.569	12.666	1	.000	.132	.043	.403
	Client Orientation	-.719	.560	1.652	1	.199	.487	.163	1.459
	Team Work	-1.929	.534	13.032	1	.000	.145	.051	.414
	Compliance to Policies	-2.374	.527	20.302	1	.000	.093	.033	.261
	[Gender=M]	0[b]	.	.	0	.	.	.	.
GOOD	Intercept	41.642	6.597	39.848	1	.000			
	Job Knowledge	-.554	.492	1.267	1	.260	.575	.219	1.508
	Skill Level	-2.054	.501	16.772	1	.000	.128	.048	.343
	Job Execution	-2.168	.551	15.514	1	.000	.114	.039	.336
	Initiative	-1.374	.484	8.063	1	.005	.253	.098	.653
	Client Orientation	-.796	.475	2.809	1	.094	.451	.178	1.144
	Team Work	-1.195	.460	6.759	1	.009	.303	.123	.745
	Compliance to Policies	-1.229	.434	8.012	1	.005	.293	.125	.685
	[Gender=M]	0[b]	.	.	0	.	.	.	.

a. The reference category is: OUTSTANDING; b. This parameter is set to zero because it is redundant.

Table 11 Predicted probabilities from Multinomial Logistic Regression of the influence of seven independent factors on dependent factor Rating (Odds Ratios and 95% CI for Exp(ß)

6. CONCLUSION

The main reason for conducting this study is that authors have not able find sufficient literature on evaluating PAS using multinomial logistic regression model comparing men and women performance. We made an attempt to assess the PAS using multinomial logistic regression model including sufficient information address an overall evaluation of the multinomial logistic regression model, statistical tests of individual predictors, goodness-of-fit statistics and assessment of predicted probabilities and its influence on PAS using likely log odds. This model adequacy is justified by multiple indicators, including an overall test of all parameters, the statistical significance of each predictor, etc. We have carried out the reliability tests for all

the dependent and independent factors and the reliability statistics C-alpha, Split-Half reliability and Spearman Prophecy suggests the internal consistency of the instrument the performance appraisal form.

The results of this study are in line with the studies conducted by the several authors using multiple regression analysis (Ochoti et al. 2012; Poornima & John Manohar, 2015; Chee Hong et al. 2012)The major limitation of the study is Rating biasedness by the evaluator/peer. The authors have no idea whether the one-to-one interview has been happened when appraising the employee. We recommend this type of studies appraising separately for gender-related parity.

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