A STUDY ON COMPONENTS CONTRIBUTING TO LABOUR PRODUCTIVITY IN PHARMACEUTICAL COMPANIES

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Abstract: *In Indian pharmaceutical industry, labour productivity is one of the least studied areas. Labour productivity plays an important role in the pharmaceutical companies. It helps companies to be competitive and to achieve goals. Labour productivity is the amount of output produced by labour in given amount of time. India is among the top 12 biotech destinations in the world. India ranks 2nd in Asia. It is important to estimate the mindset of employees working in the pharmaceutical industry and to find out the factors which affects the productivity in the respective industry. As an initiative this study is conducted in Ankleshwar city which has the following pharmaceutical company namely Cadila Pharmaceuticals Ltd, Lupin Ltd, Glenmark Pharmaceutical Ltd, APEX Healthcare Ltd, Zandu Pharma Works Ltd, Torina Pharma Ltd, Zydus Cadila, Sun Pharmaceutical Ind Ltd, Sanofi India Ltd, Hema Pharmaceuticals Pvt Ltd. For study purpose Cadila Pharmaceuticals Ltd, Lupin Ltd and Glenmark Pharmaceutical Ltd were selected using simple random sampling procedure. This study is aimed at identify the impact of individual factors and work related factors on labour productivity. In this study, individual factors includes personal factors, motivation factors and work related factors includes resource factors, factors related to work and Managerial & Interrelation factors.*

Key Words: Individual Factors, Work Related Factors, Labour Productivity, Pharmaceutical Companies

I. INTRODUCTION

Labour are very important part of any organization's success and the productivity of labour plays very important role in the development and profits of the company. India is the largest generic drugs provider globally. Indian pharmaceutical sector supplies over 50% of global demand for various vaccines, 40% generic demand in the US and 25% of all medicine in UK. India has a large pool of scientists and engineers who have to potential to steer the industry ahead to an even higher level. Indian Pharmaceutical firms supplied 80% of the antiretroviral drugs globally.

Indian pharmaceutical sector was valued at us$33 billion in 2017 and expected to be at US$55 billion in 2020. Export of India's pharmaceutical stood at US$17.27 billion in 2017 and expected to cross US$19 billion. Indian companies received 304 abbreviated new drug application approvals from the US food and drug administration in 2017. The India accounts for around 30% and about 10% in the US$70-80 billion US generics market. The important Segments in Pharmaceutical Industry are as follows:

Active pharmaceutical Ingredients (APIs)	• India became the third largest global generic API merchant market in 2016, with a 7.2% market share.
Contract research and manufactiring service	• Fragmented market with more than 1000 players.
Formulations	• India is largest exporter of formulation in terms of volume, with 14% market share.
Biosimilars	• Tthe Government plans to allocate US$70.

[Source: Pharmaceuticals -IBEF]

II.1.OBJECTIVES OF THE STUDY

This study was carried out on employees of select pharmaceutical company to find the following objectives:

- To identify the factors influencing of labour productivity in
- To measure the impact of identified factors of productivity as a function.

II.2. RESEARCH DESIGN

Descriptive research design was used by the researcher since it includes surveys. The major purpose of the descriptive research was to identify the impact of individual factors and work related factors on labour productivity.

II.3. SAMPLE DESIGN:

The researcher used questionnaire to collect data from the respondents. Convenience sampling was adopted and the researcher had identified 344 respondents for this study from select pharmaceutical companies in Ankleshwar. The study was confined to selected pharmaceutical companies in Ankleshwar only thus, other cities pharmaceutical companies were ignored in the study. The study was conducted during the month of September and October 2018.

III. STATISTICAL TOOLS USED:

The collected data have been analysed with the help of Factor analysis and regression analysis.

IV. DATA ANALYSIS AND INTERPRETATION

4.1 FACTOR ANALYSIS

Table 4.1: Consolidated results of KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.899
Bartlett's Test of Sphericity	Approx. Chi-Square	5639.472
	df	276
	Sig.	.000

Source: Primary data collected by Researcher

In this study, the value of KMO for overall matrix is found to be good (0.899) and Bartlett's test of Sphericity is highly significant ($p < 0.001$). The results thus indicate that the samples taken are appropriate to proceed with the factor analysis.

Further, to examine and define the factors clearly, it was decided to remove any variable that had factor loading below ± 0.50. After this preliminary step, factor analysis with principal component analysis as an extraction method was performed on the remaining items.

Table 4.2: Consolidated results of Eigen Values and Square Loadings

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**8.249**	34.371	34.371	8.249	34.371	**34.371**
2	**3.702**	15.426	49.796	3.702	15.426	**49.796**
3	**2.342**	9.756	59.553	2.342	9.756	**59.553**
4	**1.460**	6.084	65.637	1.460	6.084	**65.637**
5	**1.086**	4.524	70.160	1.086	4.524	**70.160**
6	.828	3.451	73.612			
7	.683	2.847	76.459			
8	.610	2.541	79.000			
9	.549	2.286	81.286			
10	.524	2.185	83.471			
11	.473	1.969	85.440			
12	.438	1.823	87.264			
13	.422	1.757	89.021			
14	.403	1.681	90.702			
15	.353	1.472	92.174			
16	.345	1.439	93.614			
17	.279	1.161	94.775			
18	.254	1.058	95.833			
19	.244	1.016	96.849			
20	.228	.950	97.799			

21	.203	.848	98.647			
22	.149	.621	99.268			
23	.090	.373	99.641			
24	.086	.359	100.000			

Source: Primary data collected by Researcher

Above table depicts the total variance explained with rotation. The Eigen values for the factors 1, 2, 3, 4 and 5 are 8.249, 3.702, 2.342, 1.460 and 1.086 respectively. Percentage of variance after the rotation for the factors 1, 2, 3, 4 and 5 are 34.371, 15.426, 9.756, 6.084 and 4.524 respectively. Cumulative percentage for the factors 1, 2, 3, 4 and 5 after the rotation are 34.371, 49.796, 59.553, 65.637 and 70.160 respectively. It indicates that the 5 factors extracted from the total of 24 variables have a cumulative percentage up to 70.160 per cent of the total variance in the measured latent variable.

Table 4.3: Consolidated results of Rotated Component Matrix

	Component				
	1	**2**	**3**	**4**	**5**
Work related knowledge always helps in doing perfect work					.659
Healthy environment affects work.		.717			
The delay in payment affects work.				.791	
Supervisor always gives clear instruction.			.738		
Better relationship with supervisor increases productivity.			.534		
The financial motivation positively affects the work.				.836	
Organization policy affects work.	.782				
Training helps in doing work effectively.	.859				
Better relationship with co-workers affects the productivity.			.821		
An extra benefits increases productivity.				.745	
Work is supervised by supervisor regularly.			.825		
There is always a definite schedule of work.	.721				
There is a risk of doing work.	.851				
Raw materials are always available at needed time.		.822			
Accident negatively affects the work.	.733				
Utility facility is continuously available.		.827			
The necessary equipment's are always available.		.678			
Personal problem affects the work.					.797
There are regular uses of safety tools.		.824			

Workload affects the efficiency toward work.	.829				
Machine Failure stops work.	.875				
Shift timings directly affect the work.					.774
There is impact of overtime on work.					.760
Electricity is available at workplace.		.768			
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization					
a. Rotation converged in 5 iterations.					

Source: Primary data collected by Researcher.

Factor 1 is the most important factor which explains 34.371 percent of the variation and consists of 07 variables. Organization policy affects work (0.782), Training helps in doing work effectively (0.859), There is always a definite schedule of work (0.721), There is a risk of doing work (0.851), Accident negatively affects the work (0.733), Workload affects the efficiency toward work (0.829) Machine Failure stops work (0.875) shows high inter-correlations amongst each other. Hence, these variables are grouped together and the researcher named those segments as **Work-related factors**. The reliability of these five variables is measured by using Cronbach's Alpha and its value is **0.912.**

Factor 2 explains 15.426 percent of the variation and consists of 06 variables. Healthy environment affects work (0.717), Raw materials are always available at needed time (0.822), Utility facility is continuously available (0.827), The necessary equipment's are always available (0.678), There are regular uses of safety tools (0.824), and Electricity is available at workplace (0.768) shows high inter-correlations amongst each other. Hence, the researcher names this segment **Resource Factors.** The reliability of these five variables is measured by using Cronbach's Alpha and its value is **0.928**

Factor 3 explains 9.756 percent of the variation and consists of 04 variables. Supervisor always gives clear instruction (0.728), Better relationship with supervisor increases productivity (0.534), Better relationship with co-workers affects the productivity (0.821), and Work is supervised by supervisor regularly (0.825) shows high inter-correlations amongst each other. Hence, the researcher names this segment **Managerial and Interrelationship factors.** The reliability of these five variables is measured by using Cronbach's Alpha and its value is **0.858**

Factor 4 explains 6.084 percent of the variation and consists of 04 variables. The delay in payment affects work (0.791), Financial motivation positively affects the work (0.836), and Extra benefits increases productivity (0.745) shows high inter-correlations amongst each other. Hence, the researcher names this

segment **Motivational Factors.** The reliability of these five variables is measured by using Cronbach's Alpha and its value is **0.816**

Factor 5 explains 4.524 percent of the variation. Work related knowledge always helps in doing perfect work (0.659), Personal problem affects the work (0.797), Shift timings directly affect the work (0.774), and there is impact of overtime on work (0.760), shows high inter-correlations. Hence, these variables are grouped together and the researcher named those segments as **Personal factors related to work.** The reliability of these eight variables is measured by using Cronbach's Alpha and its value is **0.918.**

Perception of workers towards various factors influencing productivity of organization in the present study composes five factors namely Work related factors, Resource factors, Managerial and Inter-relational factors, Motivational factors and Personal factors. The initial instrument which had 24 variables was adjusted to account for 5 factors.

Table shows the total composition of each factor that provides information regarding the items that constituted these five factors with their factor loadings, Eigen values and the variance explained by each factor. The five-factor solution accounted for **70.160** per cent of the explained variance. All the dimensions are named on the basis of the contents of final items making up each of the five dimensions. The commonly used procedure of Varimax Orthogonal Rotation for the factors, whose Eigen values are greater than 1.0, is employed in the analysis. The factors so generated have the Eigen values **8.249**, **3.702**, **2.342**, **1.460** and **1.086**. All the items are found highly loaded under these five factors. The values of communalities (h^2) range from 0.534 to 0.875 for various factors. It means that the factor analysis extracted a good amount of variance in the variables.

4.2 REGRESSION MODEL FOR IMPACT OF INDEPENDENT FACTORS ON PRODUCTIVITY

To assess the overall effect of the instrument on productivity of the labourers and to determine the relative importance of the individual dimension of the generated scale, Multiple Regression analysis is performed. For regression analysis, the study adopts the use of a single-item direct measures of productivity factors in the study area is excellent at five-point Likert scale. The regression model considers the 5 dimensions as the independent variables and the overall influencing factors as the dependent variable. The adjusted R^2 of 0.860 ($p=0.000$) indicates that 86.0 per cent of variance in productivity is predicted using the factors identified. Further, the results also indicate that all the five factors Work related factors, Resource factors, Managerial and Inter-relational factors, Motivational factors and Personal factors to be the significant predictors ($p<0.001$) of productivity of the labourers.

Table: 4.4 Regression Model Summary generated using SPSS

Model Summary									
					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.929[a]	.862	**.860**	.27318	.862	422.108	5	337	.000
a. Predictors: (Constant), Work related factors, Resource factors, Managerial and Inter-relational factors, Motivational factors and Personal factors									

Source: Primary data collected by the Researcher.

Table: 4.5 ANOVA for Regression Analysis (Results from SPSS)

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	157.499	5	31.500	422.108	.000[b]
	Residual	25.149	337	.075		
	Total	182.647	342			
a. Dependent Variable: Productivity						
b. Predictors: (Constant Work related factors, Resource factors, Managerial and Inter-relational factors, Motivational factors and Personal factors						

Source: Primary data collected by the Researcher.

Table 4.6: Showing Regression Coefficients Computed through SPSS

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.032	.015		205.563	**.000**
	Work related factors	.432	.015	.591	29.238	**.000**
	Resource factors	.404	.015	.553	27.360	**.000**
	Managerial and Inter-relational factors	.234	.015	.320	15.840	**.000**
	Motivational factors	.226	.015	.309	15.284	**.000**
	Personal factors	.070	.015	.096	4.757	**.000**
a. Dependent Variable: Overall Opinion on Productivity						

Source: Primary data collected by the Researcher.

$$LP = 3.097 + 0.591\,(WF) + 0.553\,(RF) + 0.320\,(MIF) + 0.309\,(MF) + 0.096\,(PF)$$

Where, **LP** = Labour Productivity

WF = Work related factors

RF = Resource factors

MIF = Managerial and Inter-relational factors

MF = Motivational factors

PF = Personal factors

V.DISCUSSION

- It could be found from the factor analysis that, the selected 24 variables related to labour productivity were grouped into five major factors representing Work related factors, Resource factors, Managerial and Inter-relational factors, Motivational factors and Personal factors.

- One unit increase in productivity can be observed from 0.591 unit increase of Work related factors, 0.553 unit increase of Resource factors**,** 0.320 unit increase of Managerial and Inter-relational factors 0.309 unit increase of Motivational factors and 0.096 unit increases of Personal factors.

- Work related factors, Resource factors, Managerial and Inter-relational factors, Motivational factors and Personal factors were found to be the significant predictors ($p<0.001$) of productivity of the labourers.

VI. LIMITATIONS

- The study is confine only to 344 respondents from pharmaceutical companies in Ankleshwar.
- This study only estimates the influence individual factors and work related factors.
- This study deploys only limited statistical analysis.

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