

Statistical Significance And Testing of Hypothesis

1. H₀: Motivational factors does not lead to productivity of workers in sugar factories

H₁: Motivational factors does lead to productivity of workers in sugar factories

For testing this hypothesis , we consider the following tables,

Table no 1:

Descriptive Statistics of Motivational Factors in sugar factories :

Sr. No.	Questions	Mean Response	S.D. score	n	C.V.	95% C. I.
1	Provision of Salary and Allowances and Annual Bonus	3.536	1.148	250	32.50	[3.395, 3.677]
2	First Aid/Medical Treatment/Hospitalization	3.129	1.237	248	39.50	[2.981, 3.277]
3	Availability of Restroom/Lunc Room/Canteen/ Recreational Facility	3.228	1.242	250	38.50	[3.091, 3.365]
4	Provision of Leave/Holiday and Educational Assitance for Dependents	3.53	1.14	249	32.30	[3.382, 3.678]
5	Grievance redressal procedure	3.343	1.2	248	0.359	[3.2, 3.486]
6	Open Door Policy for subordinates	2.912	1.109	250	0.381	[2.766, 3.058]
7	Regular Departmental Meetings & Pride in being an Employee of this Factory	3.12	1.102	250	0.353	[3.01, 3.23]
8	Expert counseling against job stress and tensions and proper provisions of safety apparel	3.004	1.266	250	0.421	[2.871, 3.137]

(Source: SPSS 17,2009 version)

From the above table provision of salary, annual bonus ,medical treatments, provision of leave and holidays has more significance and having higher coefficient of variation explained.

Table no 2:**One sample statistics for motivational factors:**

One-Sample Test							
Test Value = 0							
Parameter	t	df	Sig. (2- tailed)	Mean Difference	95% Confidence Interval of the Difference		Decision
					Lower	Upper	
Provision of Salary and Allowances and Annual Bonous	48.7	249	0	3.536	3.39	3.68	Reject
First Aid/Medical Treatment/Hospitalization	39.839	249	0	3.129	2.97	3.28	Reject
Availability of Restroom/Lunc Room/Canteen/ Recreational Facility	41.099	249	0	3.228	3.07	3.38	Reject
Provision of Leave/Holiday and Educational Assitance for Dependents	48.884	249	0	3.53	3.39	3.67	Reject
Grievance redressal procedure	43.856	249	0	3.343	3.19	3.49	Reject
Open Door Policy for subordinates	41.529	249	0	2.912	2.77	3.05	Reject
Regular Departmental Meetings & Pride in being an Employee of this Factory	44.764	249	0	3.12	2.98	3.26	Reject
Expert counseling against job stress and tensions and proper provisions of safety apparel	37.522	249	0	3.004	2.85	3.16	Reject

(Source: SPSS 17,2009 version)

From above table ,all the variables considered for motivational factors were tested by one sample t test ,as the sample size is 250 and data is normally distributed at 5 percent level of significance at 249 degree of freedom.Each variable consider is rejected with applying the t test. But the data is measured with 5 likert scale so it is necessary to apply the kolmogorov Simrov test for testing the hypothesis.

**Table no 3:
Kolmogorov Simrov Test:**

Parameter	N	Normal Parameters ^{a,b}		Most Extreme Differences			Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)	Decision
		Mean	Std. Deviation	Absolute	Positive	Negative			
Provision of Salary and Allowances and Annual Bonous	250	3.54	1.148	0.188	0.188	-0.183	2.968	0	Reject
First Aid/ Medical Treatment/Hospitalization	250	3.13	1.237	0.154	0.154	-0.154	2.433	0	Reject
Availability of Restroom/ Lunc Room/ Canteen/ Recreational Facility	250	3.23	1.242	0.189	0.189	-0.155	2.986	0	Reject
Provision of Leave/ Holiday and Educational Assitance for Dependents	250	3.53	1.14	0.182	0.157	-0.182	2.873	0	Reject
Grievance redressal procedure	250	3.34	1.2	0.165	0.165	-0.156	2.595	0	Reject
Open Door Policy for subordinates	250	2.91	1.109	0.223	0.223	-0.145	3.52	0	Reject
Regular Departmental Meetings & Pride in being an Employee of this Factory	250	3.12	1.102	0.215	0.215	-0.125	3.405	0	Reject
Expert counseling against job stress and tensions and proper provisions of safety apparel	250	3	1.266	0.181	0.181	-0.159	2.866	0	Reject

(Source: SPSS 17,2009 version)

From above table no 1,2,3 it is seen that hypothesis is rejected at 5 percent level of significance and we conclude that Motivational factors does lead to productivity of workers in sugar factories

Hypothesis 2 :

H₀: Management Control System does not improves the work culture for production workers

H₁: Management Control System does improves the work culture for production workers

For testing this hypothesis , we consider the Descriptive statistics as well as Chi Square test.

Table no 4 :

Descriptive Statistics For Management control system parameters :

Sr. No.	Variables	Mean Response	S.D. score	n	C.V.	95% C. I.
1	Human Resource Planning	2.59	1.403	249	54.20%	[2.409, 2.771]
2	Recruitment and Selection	3.576	1	250	28.00%	[3.463, 3.689]
3	Training and Development	3.426	1.259	249	36.70%	[3.269, 3.583]
4	Performance Appraisal	3.448	1.238	250	35.90%	[3.289, 3.607]
5	Carrer advancement Avenues	3.2	1.252	250	39.10%	[3.069, 3.331]
6	Wages and Salary structures	2.947	1.174	245	39.80%	[2.826, 3.068]
7	Promotion and transfer	2.612	1.254	250	48.00%	[2.501, 2.723]
8	Safety measures	3.328	1.294	250	38.90%	[3.167, 3.489]

(Source: SPSS 17,2009 version)

It is seen that human resource planning (54.2 percent), promotions (48 percent), performance appraisal (35.90), career advancement avenueues (39.8 percent), wages and salary structures (39.8 percent) and other all are significant factors of management control system.

Table no 5 :

One Sample Statistics:

One-Sample Test							
	Test Value = 0						
					95% Confidence Interval of the Difference		
Parameter	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper	Decision
Human Resource Planning	29.133	249	0	2.59	2.42	2.77	Reject
Recruitment and Selection	56.535	249	0	3.576	3.45	3.7	Reject
Training and Development	42.948	249	0	3.426	3.27	3.58	Reject
Performance Appraisal	44.026	249	0	3.448	3.29	3.6	Reject
Carrer advancement Avenues	40.428	249	0	3.2	3.04	3.36	Reject
Wages and Salary structures	39.29	249	0	2.947	2.8	3.09	Reject
Promotion and transfer	32.942	249	0	2.612	2.46	2.77	Reject
Safety measures	40.657	249	0	3.328	3.17	3.49	Reject

(Source: SPSS 17,2009 version)

One sample statistics shows that all parameter were rejected at 5 percent level of significance and 249 degree of freedom. All the values of t distribution were highly significant than table value .As data is measured with 5 point likert scale and parameter are less so researcher apply chi square test to test the hypothesis.

Table no 6 :
Chi Square Test :

Test Statistics								
Test	Human Resource Planning	Recruitment and Selection	Training and Development	Performance Appraisal	Carrer advancement Avenues	Wages and Salary structures	Promotion and transfer	Safety measures
Chi-Square	26.482 ^a	121.400 ^b	36.522 ^a	44.000 ^b	51.400 ^b	36.898 ^c	38.680 ^b	31.480 ^b
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.000	.000	.000	.000	.000	.000	.000	.000
a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.8.								
b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 50.0.								
c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.0.								

(Source: SPSS 17,2009 version)

From above table no 4,5,6 says that we reject the hypothesis at 5 percent level of significance and conclude that Management Control System does improves the work culture for production workers

Hypothesis 3 :

H₀: All allowances are not interdependent for the productivity of sugar factory workers

H₁: All allowances are not interdependent for the productivity of sugar factory workers

For testing this hypothesis ,researcher consider the descriptive statistics as well as Chi Sqaure test at 5 percent level of significance.

Table no 7 :

Descriptive Statistics:

Sr. No.	Questions	Mean Response	S.D. score	n	C.V.	95% C. I.
1	Dearness Allowances	4.044	0.832	250	20.60%	[3.939, 4.149]
2	House Rent Allowances	3.908	0.741	250	19.00%	[3.825, 3.991]
3	Conveyance Allowance	3.968	0.873	250	22.00%	[3.872, 4.064]
4	Washing Allowance	3.675	0.956	249	26.00%	[3.554, 3.796]
5	Heat Allowances	3.528	1.053	250	29.80%	[3.4, 3.656]
6	Dust Allowances	3.664	0.882	250	24.10%	[3.566, 3.762]
7	Night shift Allowance	3.564	0.956	250	26.80%	[3.452, 3.676]
8	Special Pay Allowance	3.512	1.124	250	32.00%	[3.38, 3.644]

(Source: SPSS 17,2009 version)

From above table ,dearness allowance (20.60 percent) ,house rent allowance (19.00 percent), washing allowance (32.00 percent), night shift allowance (26.85 percent) were significantly important

Table No 8 :
One Sample t test:

One-Sample Test							
	Test Value = 0						
					95% Confidence Interval of the Difference		
Parameter	t	df	Sig. (2- tailed)	Mean Difference	Lower	Upper	Decision
Dearness Allowances	76.819	249	0	4.044	3.94	4.15	Reject
House Rent Allowances	83.339	249	0	3.908	3.82	4	Reject
Conveyance Allowance	71.872	249	0	3.968	3.86	4.08	Reject
Washing Allowance	60.655	249	0	3.675	3.56	3.79	Reject
Heat Allowances	52.955	249	0	3.528	3.4	3.66	Reject
Dust Allowances	65.671	249	0	3.664	3.55	3.77	Reject
Night shift Allowance	58.958	249	0	3.564	3.44	3.68	Reject
Special Pay Allowance	49.413	249	0	3.512	3.37	3.65	Reject

(Source: SPSS 17,2009 version)

One sample statistics shows that all parameter were rejected at 5 percent level of significance and 249 degree of freedom. All the values of t distribution were highly significant than table value .As data is measured with 5 point likert scale and parameter are less so researcher apply chi square test to test the hypothesis.

Table no 9 :
Chi Square Test:

Chi Square Test								
Test Statistics								
Test	Dearness Allowances	House Rent Allowances	Conveyance Allowance	Washing Allowance	Heat Allowances	Dust Allowances	Night shift Allowance	Special Pay Allowance
Chi-Square	113.936 ^a	134.608 ^a	154.280 ^b	113.068 ^c	88.680 ^b	151.720 ^b	106.680 ^b	62.080 ^b
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.000	.000	.000	.000	.000	.000	.000	.000
Decision	Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject
a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 62.5.								
b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 50.0.								
c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.8.								

(Source: SPSS 17,2009 version)

From above table no 7,8,9 ,we reject the hypothesis at 5 percent level of significance and conclude that All allowances are interdependent for the productivity of sugar factory workers

Hypothesis 4 :

H₀: All Welfare Facilities are not interdependent and satisfactory for the productivity of sugar factory workers

H₁: All Welfare Facilities are not interdependent and satisfactory for the productivity of sugar factory workers

For testing this hypothesis ,researcher consider the descriptive statistics as well as Chi Sqaure test at 5 percent level of significance.

Table No 10 :
Descriptive Statistics for welfare facilities

Sr. No.	Questions	Mean Response	S.D. score	n	C.V.	95% C. I.
1	Leave Facilities	4.184	0.785	250	18.80%	[4.059, 4.309]
2	Medical Facilities	3.892	0.878	250	22.60%	[3.785, 3.999]
3	Canteen	3.828	0.935	250	24.40%	[3.721, 3.935]
4	Rest and Lunch Room	3.84	0.922	250	24.00%	[3.732, 3.948]
5	Facilities for Children Education	3.884	0.943	250	24.30%	[3.76, 4.008]
6	Loans and Advances	3.636	0.931	250	25.60%	[3.55, 3.722]
7	Retirement Benefits	3.536	1.102	250	31.20%	[3.371, 3.701]
8	Supply of Uniform and shoes	3.816	0.795	250	20.80%	[3.714, 3.918]
9	Housing Facilities	3.784	0.991	250	26.20%	[3.675, 3.893]

(Source: SPSS 17,2009 version)

From the above table responedents need leave facility more (Mean 4.184), Medical facilities (Mean 3.892), retirement facilities (31.20 percent) as well as canteen facility (24.40 percent) . Thus people need the welfare facilities as equal as they are.

Table No 11 :
Chi Square Test for welfare facilities

Parameter	Chi-Square	df	Asymp. Sig.	Decision
Leave Facilities	104.112 ^a	3	0	Reject
Medical Facilities	156.280 ^b	4	0	Reject
Canteen Facility	151.720 ^b	4	0	Reject
Rest and Lunch Room	46.736 ^a	3	0	Reject
Facilities for Children Education	121.960 ^b	4	0	Reject
Loans and Advances	131.240 ^b	4	0	Reject
Retirement Benefits	91.360 ^b	4	0	Reject
Supply of Uniform and shoes	97.968 ^a	3	0	Reject
Housing Facilities	129.160 ^b	4	0	Reject

(Source: SPSS 17,2009 version)

From above table no 10 and 11 ,we reject the hypothesis at 5 percent level of significance and conclude that All Welfare Facilities are not interdependent and satisfactory for the productivity of sugar factory workers at 5 percent level of significance.

Hypothesis 5 :

H₀: Work culture is not satisfactory for the productivity of sugar factory workers

H₁: Work culture is satisfactory for the productivity of sugar factory workers

For testing this hypothesis we determine the all factors work culture related to workers as we as management with one sample t test as well as kolmorov Simrov Test.

**Table No 12:
Descriptive Statistics of work culture**

Sr. No.	Questions	Mean Response	S.D. score	n	C.V.	95% C. I.
1	Employee Participation in Management	3.976	0.952	250	23.90%	[3.866, 4.086]
2	Social Security Measures	3.492	1.159	250	33.20%	[3.342, 3.642]
3	Collective Bargaining	3.764	0.853	250	22.70%	[3.649, 3.879]
4	Employee Discipline	3.76	0.939	250	25.00%	[3.634, 3.886]
5	Employee Grievance Handling	3.696	0.967	250	26.20%	[3.592, 3.8]
6	Industrial Relations Practices	3.472	1.087	250	31.30%	[3.354, 3.59]
1	Responsibility of Planning	3.076	1.399	250	45.50%	[2.889, 3.263]
2	Staff Grievance Procedure	2.664	1.459	250	54.80%	[2.474, 2.854]
3	Major causes of Absenteeism	3.164	1.327	250	41.90%	[2.992, 3.336]
4	Steps taken to enhance Productivity	3.544	1.368	250	38.60%	[3.391, 3.697]
5	Objective of HR Planning Process	3.241	1.475	250	45.50%	[3.053, 3.429]
6	Bases For Manpower Selection	3.456	1.344	249	38.90%	[3.299, 3.613]
7	Conduction of Training & Development	3.316	1.216	250	36.70%	[3.168, 3.464]
8	Promotion Policy Adopted in the Factory	3.7	1.193	250	32.20%	[3.552, 3.848]

(Source: SPSS 17,2009 version)

All factors have nearly equal coefficient of variation show all factors are significantly important.

**Table No 13:
One Sample t Test:**

One-Sample Test							
	Test Value = 0						
					95% Confidence Interval of the Difference		
Parameter	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper	Decision
Employee Participation in Management	66.009	249	0	3.976	3.86	4.09	Reject
Social Security Measures	47.638	249	0	3.492	3.35	3.64	Reject
Collective Bargaining	69.789	249	0	3.764	3.66	3.87	Reject
Employee Discipline	63.305	249	0	3.76	3.64	3.88	Reject
Employee Grievance Handling	60.426	249	0	3.696	3.58	3.82	Reject
Industrial Relations Practices	50.495	249	0	3.472	3.34	3.61	Reject
Responsibility of Planning	34.757	249	0	3.076	2.9	3.25	Reject
Staff Grievance Procedure	28.877	249	0	2.664	2.48	2.85	Reject
Major causes of Absenteeism	37.708	249	0	3.164	3	3.33	Reject
Steps taken to enhance Productivity	40.96	249	0	3.544	3.37	3.71	Reject
Objective of HR Planning Process	34.673	248	0	3.241	3.06	3.43	Reject
Bases For Manpower Selection	40.647	249	0	3.456	3.29	3.62	Reject
Conduction of Training & Development	43.126	249	0	3.316	3.16	3.47	Reject
Promotion Policy Adopted in the Factory	49.03	249	0	3.7	3.55	3.85	Reject

(Source: SPSS 17,2009 version)

In one sample t test all parameters were rejected at 5 percent level of significance and conclude that Work culture is satisfactory for the productivity of sugar factory workers.

Table No 15:

Conclusion of Hypothesis Testing:

Sr.No.	Null Hypothesis	Test Used	Level of Significance	degree of Freedom	Decision
1	Motivational factors does not lead to productivity of workers in sugar factories	Kolmorov Simrov Test	0.05	249	Reject the hypothesis
2	Management Control System does not improves the work culture for production workers	Chi Square Test	0.05	249	Reject the hypothesis
3	All allowances are not interdependent for the productivity of sugar factory workers	Kolmorov Simrov Test	0.05	249	Reject the hypothesis
4	All Welfare Facilities are not interdependent and satisfactory for the productivity of sugar factory workers	Chi Square Test	0.05	249	Reject the hypothesis
5	Work culture is not satisfactory for the productivity of sugar factory workers	One Sample t test	0.05	249	Reject the hypothesis

(Source: SPSS 17,2009 version)