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Received: 05 January, 2018

Accepted: 25 January, 2018

Published: 26 January, 2018

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Research Article

Study on improvement of manpower performance & safety in construction firms

Abstract

The construction an industry everywhere faces problems and challenges in the developing countries, this is study aim to improve the manpower of performance and safety of the construction firms. In this project work analyses the safety and manpower performance in the construction firms in additionally the lot of literatures review and build the questionnaires to conduct the survey in the field of constructor. When it is use collect data among the 25 workers to know the risk factors and statistical analysis to give some suggestion still had been reducing the fatigue of workers and increasing facilitate for the work hence develop as well as improve the performance of manpower and performing every construction work in a safe manner.

Introduction

The topic performance improvement is quite important from organizational point of view. The systematic assessment of employee performance is comparatively recent development in India. Performance Appraisal has been used in large number of organization for controlling employees rather than developing them. For my study have chosen construction industries. In that industries to construct the buildings, roads etc, here lot of accidents because of insufficient safety so collect the information to control the accidents. One of the main concerns of employee is the fairness of the Performance measures, since the process is central to so many HRM decision. By addressing the employee concerns by analyzing the ergonomic factors that affect their performance during the stage of the appraisal process, the organization will help the appraisal program and safety to succeed in reaching it goals.

Literature Review

The literature review was conducted on the papers published in international and national journals on the topics related to improvement of manpower performance and safety in construction organizations, physical ergonomics, organization ergonomics, environmental ergonomics and cognitive ergonomics. A review of the research papers on the above topics were also conducted for guidelines.

Tam et al. (2004) did a study in China and noticed that the causes of accidents were due to poor safety awareness from top

leaders; lack of training; poor safety awareness of managers; reluctance to input resources for safety; reckless operation; lack of certified skill labour; poor equipment; lack of first aid measures; lack of rigorous enforcement of safety regulation; lack of organizational commitment; low education level of workers; poor safety conscientiousness of workers.

Mostafa et al did a study towards improving construction labour productivity that proper management of resources in construction projects can yield substantial savings in time and cost and inefficient management can result in low productivity.

Amarh Christian Amartey et al about the safety of the firms and factors affecting the safety of the firms then give the methodology to solve the problem about the poor safety in construction firms. Kin dorji and bonaventura h.w.hadikusumo et al did study in Bhutanese construction industry to know the lack safety regulation and standards then understand the low priorities of safety and lock of safety training and implement all these to improve the safety of the construction firms.

Methodology

The framework of the project is shown in figure 1, from analysis the nature of work to find the ways to achieve the goals is explained.

Statistical analysis

Reliability analysis allows you to study the properties of the measurement scales and items that compose scales. The

reliability analysis procedure calculates a number of commonly used measures of scale reliability and also provides information about the relationships between individual items in the scale. Intra class coefficients can be used to compute the inter-rater reliability estimates (Tables 1-3).

Alpha model (Cronbach Model) is a model of internal consistency, based on the average inter- item relation. In statistics cronbach's alpha (α) is a measure of internal consistency.

It is commonly used as an estimate of the reliability of a psychometric test of the sample of examinees (Figures 2-4).

Suggestion

Work Time: Discuss with management to change the work time to increase the manpower performance

Job Stress:

1. Relax and breathe deeply: Whether you are feeling overwhelmed by the amount of work you have to do or if someone is "in your face", a good thing to do is to "breathe through your nose". You can't get as worked up if you force yourself to breathe through your nose. Your body simply can't maintain the same level of energy without that extra oxygen you get when breathing through your mouth.

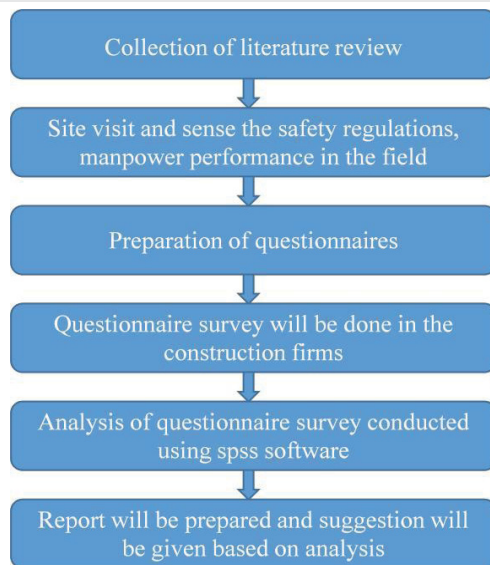


Figure 1: Design of the Project.

Table 1: Reliability Analysis Results.

Sl.No	Factors	No. of items used	No. of samples taken	Cronba ch's alpha
1	Job stress factors	05	24	0.618-0.734
2	Motivati onal factors	05	24	0.598-0.721
3	Anthropometric factors	05	24	0.608-0.626
4	Environ mental factors	05	24	0.578-0.716
5	Welfare factors	05	24	0.591-0.695

Table 2: Reliability Analysis Results

Sl.no	Domain	Subfactors	T	DOF	Sig. (2-tailed)	MeanDifference
1	Job stress factors	Work time	0	23	1	0
		Repetitiveness	-5.204	23	0	-1.08
		Stress	3.375	23	0.003	0.52
		Leave	4.543	23	0	0.68
		Seating	-6.039	23	0	-1.12
2	Motivati onal factors	Co employees	-2.216	23	0.036	-0.6
		Competition	1.141	23	0.265	0.24
		Incentives	-4.734	23	0	-1.04
		Allowances	-3.662	23	0.001	-0.88
		Relationship	-5.527	23	0	-1.12
3	Anthropometric factors	Break time	-5	23	0	-1
		Reputation	-3.464	23	0.002	-0.8
		Specialization	-2.828	23	0.009	-0.8
		Helpful	-4.226	23	0	-0.96
		Environment	-4.472	23	0	-1
4	Environmental factor	Noise	3.302	23	0.003	0.68
		Heat	-3.266	23	0.003	-0.8
		Preventive	1.186	23	0.247	0.24
		Vibration	3.578	23	0.002	0.8
		Health problem	-2.322	23	0.029	-0.68
5	Welfare factor	Superior helpful	-5	23	0	-1
		Rewards	-2.167	23	0.04	-0.6
		Facilities	-3.258	23	0.003	-0.92
		Insurance	2.914	23	0.008	0.56
		Safety check	2.914	23	0.008	0.56

One Tailed Test for Job Stress Sub Factors

Table 3: One tailed test results for job stress sub factors.

Sl. No	Physical ergonomics factors	Mean Value	T Value	P Value	Significance
1	Work time	3	0	1.000	H1
2	Repetitiveness	1.92	-5.204	0.000	H0
3	Stress	3.52	3.375	0.003	H1

2. Take more breaks from your work: Even a five-minute break will help. Get away from your desk. Go for a walk - outside is better, but up two flights of stairs and back down is good too. Getting more exercise in general will help you reduce your overall stress levels and that will make it easier to reduce your stress level at work.

3. Lighten up: Smile more. We all know laughter reduces stress. You will be amazed at how much more pleasant the people around you are when you make an effort to be pleasant yourself.

4. Don't sweat the small stuff: Realize that there are some things that just aren't worth worrying about and there are some things you just can't change. Don't waste time stressing over the things in either category.

5. Spend more time with optimistic people: Negative people will pull you down to their level. Choose to work with people who have a positive attitude instead.

Leave:

- Increase the number of days leave worker performance increases.
- Proper and adequate leave will enhance employee performance.

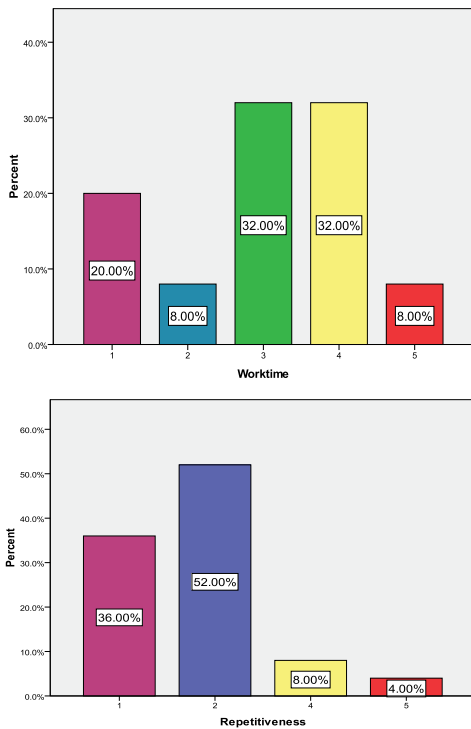


Figure 2: Bar Chart for Work time and Repetitiveness.

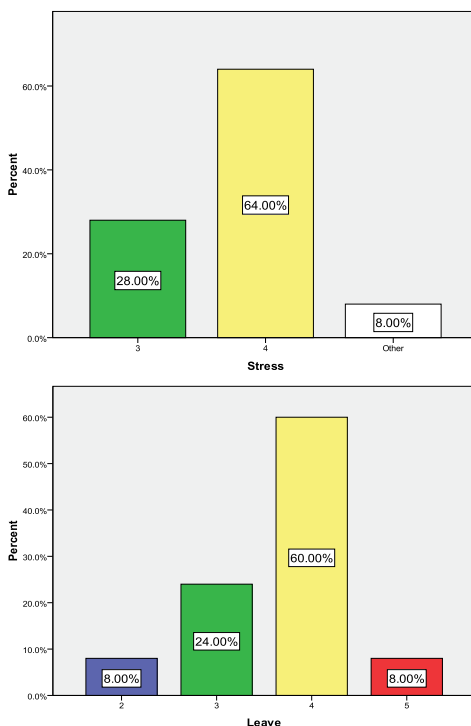


Figure 3: Bar Chart for stress and Leave.

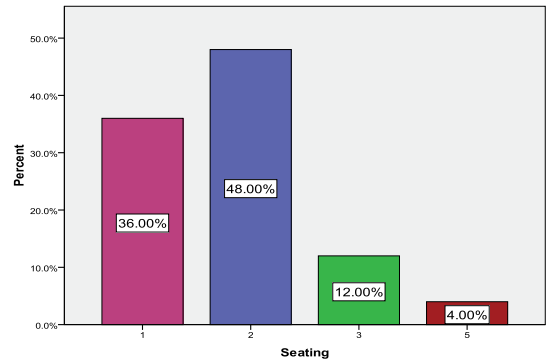


Figure 4: Bar Chart for Seating.

- Adequate leave at the time of pregnancies and other emergencies will increase employee attitude towards company and thereby performance
- Adequate leave for company tours and other emergency times will increase employee productivity

Competition:

1. Get organized: Becoming organized is the first step towards becoming a more performance but chances are, you aren't nearly as organized as you know you should be. If you maintain an organized environment, not only will you be better able to locate important information within a tight time frame, but you'll also feel more motivated. Because cleanliness and organization are mood boosters at their core, they help to encourage calm, promote concentration, and foster motivation; motivation, in turn, is a direct precursor of improve the manpower performance.

Noise: Reducing noisy machine operations by replacing rivets with welds

A personal hearing protector can be worn to cover the ear and ear canal entrance, or inserted in the ears of a person to protect their hearing. Personal hearing protectors should be used when levels of excessive noise cannot be reduced by using other control measures.

Workers or others at the workplace should be:

- supplied with personal hearing protectors of correct rating and suitable for the work conditions
- instructed in their correct use
- instructed to wear them when exposed to noise
- Monitored to ensure they wear hearing protection.

Preventive Measures:

- The regulations state that employers must provide safety signs whenever there is a risk that has not been avoided or controlled by other means.
- Individual will be trained and equipped to have the skills and facilities to ensure an accident free workplace.

- Wear personal protective equipment (PPE) as to reduce the accident and increase the performance.
- Isolate the employee from the hazard.
- Enforce safety rules and regulations.
- Provide warning devices.

Vibration:

1. Safe Work Practices: Along with using anti-vibration tools and gloves, workers can reduce the risk of hand-arm vibration syndrome (HAVS) by following work practices:

- Employ a minimum hand grip consistent with safe operation of the tool or process.
- Wear sufficient clothing, including gloves, to keep warm.
- Maintain properly sharpened cutting tools.
- Consult a doctor at the first sign of vibration disease and ask about the possibility of changing to a job with less exposure.

2. Anti- Vibration Tools: Tools can be designed or mounted in ways that help reduce the vibration level. For example, using anti-vibration chain saws reduces acceleration levels by a factor of about 10. These types of chain saws must be well maintained.

Maintenance must include periodic replacement of shock absorbers. Some pneumatic tool companies manufacture anti-vibration tools such as anti-vibration pneumatic chipping hammers, pavement breakers and vibration-damped pneumatic riveting guns.

3. Anti- Vibration Gloves: Conventional protective gloves (e.g., cotton, leather), commonly used by workers, do not reduce the vibration that is transferred to workers' hands when they are using vibrating tools or equipment. Anti-vibration gloves are made using a layer of viscoelastic material. Actual measurements have shown that such gloves have limited effectiveness in absorbing low-frequency vibration, the major contributor to vibration-related disorders.

Therefore, they offer little protection against developing vibration-induced white finger syndrome. However, gloves do provide protection from typical construction hazards (e.g., cuts, abrasions) and from cold temperatures that, in turn, may reduce the initial sensation of white finger attacks.

4. Whole-Body Vibration: The following precautions help to reduce whole-body vibration exposure:

- Limit the time spent by workers on a vibrating surface.
- Mechanically isolate the vibrating source or surface to reduce exposure.
- Ensure that equipment is well maintained to avoid excessive vibration.

5. Equipment selection:

- Select the lowest vibration tool that is suitable and can do the work efficiently.
- Limit the use of high-vibration tools wherever possible.

Example: To cut large holes in brickwork, use a diamond-tipped hole-cutting drill bit with a rotary action rather than a tungsten-tipped hole bit which requires rotary and hammer action.

Insurance:

Group Health Insurance is available in India. It provides healthcare coverage to a group of people belonging to a common community (typically as employees of a company). These plans are generally uniform in nature, offering the same benefits to all employees or members of the company so the manpower performance automatically increases.

Safety check:

Regularly check the safety equipments, ladders, scaffoldings, and crane etc.

Conclusion

The performance measurement of manpower in construction is satisfactory. In this project, I have examined factors affecting workers performance and its relation with ergonomics. From my assessment I found out that performance is related to ergonomic factors. A questionnaire has been prepared according to my assessment which is related to the working environment in construction industries and a survey is conducted among workers of different work groups. From the result obtained from the survey t-test has been conducted to find out ergonomics risk factors which affects manpower performance. From the results the risk factors are Work time, Stress, Leave, Competition, Noise, Preventive measures, Vibration, Insurance and safety check affect the performance of workers and suitable suggestions according to the working environment were implement against the risk factors and thus a more productive environment will be create and thus the performance of the manpower will be improve.

Performance measurement motivates the employees to do better and more work to some extent

- It helps for establishment of harmonious between employers and employees.
- Performance measurement helps to evaluate the success of training programs
- It let the employee to know his potential.
- It helps to identify the strength and weakness of the employees.
- Management can provide with frequent training and development program to their employees to improve knowledge in their job.

References

1. Shehata ME, El-Gohary KM (2011) Towards improving construction labour performance and projects performance. Alexandria Engineering Journal 50: 321-330. [Link: https://goo.gl/ZgwYGR](https://goo.gl/ZgwYGR)
2. Sasidhar J (2017) A computer based approach for material, manpower and equipment. IOP science. [Link: https://goo.gl/fXAxac](https://goo.gl/fXAxac)
3. Richardson, construction safety and Worker performance.
4. K Mouleeswaran Evaluation of Safety Performance Level of Construction Firms In And Around Erode Zone. International Journal of Innovative Research in Science, Engineering and Technology. [Link: https://goo.gl/i4r4cQ](https://goo.gl/i4r4cQ)
5. Yu-Jen Wu, Jiang-Liang Hou (2010) An employee performance estimation model for the logistics industry. Decision support systems 48: 568-581. [Link: https://goo.gl/qy9gHk](https://goo.gl/qy9gHk)
6. Gurday G, Ulusoy G, Kilic K, Alpkan L (2011) Effects of innovation types on firm performance. Int J Production Economics 133: 662-676. [Link: https://goo.gl/gnfTVU](https://goo.gl/gnfTVU)
7. Ukko J, Tenhunen J, Rantanen H (2007) Performance measurement impacts on management and leadership: Perspectives of management and employees. International journal of production ergonomics 110: 39-51. [Link: https://goo.gl/au7oxz](https://goo.gl/au7oxz)