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Behavior based safety (BBS) prevention of employees at workplace

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Abstract--Behavior Based Safety (BBS) is a course of action that informs management and employees of the general safety of the workplace through safety observations. BBS is proposed to focus workers' attention on their own and their peers' daily safety behavior. Then it is a process aimed at reinforcing daily behavior by employees and leaders through safety prevention, reducing the risks of accidents in the workplace.

Keywords--Behaviour Based Safety (BBS), Safety Prevention, Employee Intention to Safety Prevention.

Introduction

Behavior-Based Safety Management focuses on the identification and modification of critical safety behaviors and emphasizes how such behaviors are linked to workplace injuries and losses. Behavior Based Safety is a process that reduces unsafe behaviors that can lead to incidents occurring in the workplace. The process works by reinforcing safe behavior and identifying the causes of unsafe behavior. Behavior Based safety management also discusses the future directions or strategies for improving the management of workplace safety Prevention.

Review of Literature

Sandy Smith, (2010) examined safety assessment surveys at the workplace, and give four suggestions for the management to prevent accidents at workplace. These are, organization assurance towards safety, training on proactive management skills for senior and mid-level managers, stimulus of supervisors, and active participation of employees in safety, will positively prevent accidents.

Scott Geller. E (2001) states that the BBS approach provides tools and procedures employees can use to take control of their own safety performance, thereby enabling a bottom-up empowerment approach to reducing occupational risks and preventing workplace injuries. An effective BBS approach requires a careful analysis of the context in which desirable and undesirable behaviors occur. Subsequently, behavior change interventions need to be de-signed, implemented, and evaluated Safety-related behavior in a work setting usually starts out as other directed. Such direction can come from a policy statement, an operation manual, or a training program. After people learn what to do, essentially by memorizing or internalizing the relevant instructions, their behavior can become self-directed.

Pratiwi (2018) described most companies in Indonesia today have applied an alternative for safety program, namely Behavior-Based Safety (BBS). It is a process creates safety partnership between the management and workers with a sustainable focus on the attention and actions toward everyone, as well as the effort of safe behaviour. Implementing Behavior-Based Safety (BBS) can help identify unsafe behaviour and eliminate them, thus increasing safe behaviour for workers to prevent accidents.

Ningsih and Ardyanto, (2013) their research study described preventing work accidents can be done by focusing on reducing unsafe behaviour. Identification of unsafe act or unsafe behaviour can be conducted in various ways; one of them is by using Behavior-Based Safety (BBS). The activation of Behavior-Based Safety (BBS) program at PT Denso Indonesia has managed to reduce the frequency of unsafe behaviour and increase the frequency of safe behaviour in radiation workers. Number of work accident at PT Denso Indonesia also saw a decline by 67-89% from the previous period after applying BBS program. Therefore, companies need to conduct analysis on the Behavior-Based Safety (BBS) implementation to assess its optimization.

Research Methodology

The study was conducted on 520 employees, simple random sampling techniques from public sector manufacturing unit, identifying those working in the high-risk area and conducting the survey with them. For this study, the descriptive research study method was carried out. Questions are asked under various headings and employees' feedback are listed.

Objective: To study the behaviour-based safety prevention among public sector production department employees at their work place

Multiple Regression Analysis of Employees' Opinion on Safety Prevention Abbreviation of Safety Prevention (SP)

Abbreviation	Safety Prevention (SP)
SP-1	Senior Managers seem interested in safety
SP-2	Safety performing observations helps to employees for personal safety
SP-3	Superiors often observe work practices for protecting safety

	and health
SP-4	SPOC (specific point of contact) system exists for raising safety issues
SP-5	Safety related issues raised in various audits / inspections are liquidated

Table- 1(a): Model Fit Summary

Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate
Safety Prevention	0.926	0.857	0.856	0.24251

Model reveals that R- (Multiple Correlation Coefficients) value is 0.926. It is measuring the degree of relationship between the Safety Prevention and the predicted values 'Senior Managers seem interested in safety' (SP-1), 'Safety performing observations helps to employees for personal safety' (SP-2), 'Superiors often observe work practices for protecting safety and health' (SP-3), 'SPOC (specific point of contact) system exists for raising safety issues' (SP-4) and 'Safety related issues raised in various audits / inspections are liquidated'(SP-5).

R-Square (Coefficient of Determination) value is 0.857. It is more than about 85% of the variation of Safety Prevention is explained by the variation in the independent variables 'Senior Managers seem interested in safety' (SP-1), 'Safety performing observations helps to employees for personal safety' (SP-2), 'Superiors often observe work practices for protecting safety and health' (SP-3), 'SPOC (specific point of contact) system exists for raising safety issues' (SP-4) and 'Safety related issues raised in various audits / inspections are liquidated'(SP-5). Adjusted R- squared value is 0.856. It adjusts the statistic based on the number of independent variables in the model. That is the desired property of goodness-of- fit statistic.

Table-1(b): ANOVA

Safety Prevention	Sum of Squares	df	Mean Square	F	Sig.
Regression	181.148	5	36.230	616.041	.000
Residual	30.229	514	0.059		
Total	211.377	519			

The *F*-ratio in the **ANOVA** table interprets the overall regression model, which is a normal fit for the data. The result of $F(5, 514) = 616.041$ and 'p' value 0.000 is less than 0.05 ($p < 0.05$), the regression model is a good fit for the data; therefore, this model is a linear relationship between the dependent and independent variables.

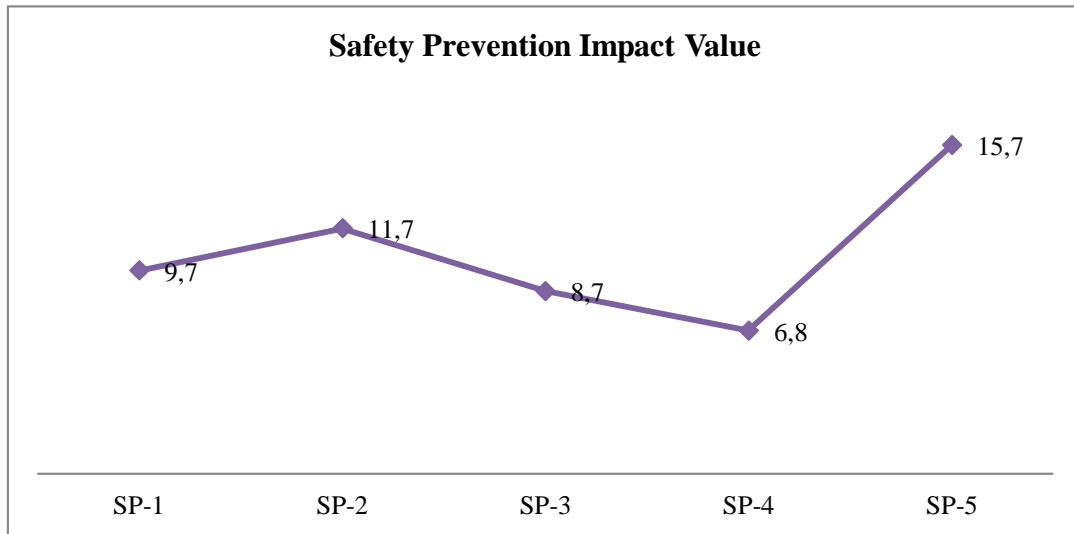
Table-1(c): Relationship between a linear combination of the Safety Prevention variables

Safety Prevention	Un standardized Coefficient		Standardized Coefficient	t	P-Value
	B	Std. Error	Beta		
(Constant)	-0.014	0.081		-1.789	.074
Senior Managers seem interested in safety (SP-1)	0.200	0.021	0.225	9.690	.000
Safety performing observations helps to employees for personal safety (SP-2)	0.250	0.021	0.268	11.695	.000
Superiors often observe work practices for protecting safety and health (SP-3)	0.168	0.019	0.193	8.709	.000
SPOC (specific point of contact) system exists for raising safety issues (SP-4)	0.113	0.016	0.139	6.831	.000
Safety related issues raised in various audits / inspections are liquidated (SP-5)	0.303	0.019	0.345	15.669	.000

The above table derives the equation of Employees' Opinion on Safety Prevention dependent variables like

$$\text{Safety Prevention} = 0.041 + 0.200(\text{SP-1}) + 0.250(\text{SP-2}) + 0.168(\text{SP-3}) + 0.113(\text{SP-4}) + 0.303(\text{SP-5})$$

The above table shows the independent variables of the 'Senior Managers seem interested in safety' (SP-1), 'Safety performing observations helps to employees for personal safety' (SP-2), 'Superiors often observe work practices for protecting safety and health' (SP-3), 'SPOC (specific point of contact) system exists for raising safety issues' (SP-4) and 'Safety related issues raised in various audits / inspections are liquidated' (SP-5) are highly significant; the p-values are less than 0.05.



The significant variables are comparing with t-values; the resulted that the first influenced Safety Prevention is 'Safety related issues raised in various audits / inspections are liquidated' (SP-5), the t-value is 15.669. The second influenced variable is 'Safety performing observations helps to employees for personal safety' (SP-2), the t-value is 11.695. The third influenced variable is 'Senior Managers seem interested in safety' (SP-1), the t-value is 9.690.

Findings

The study exposed that the employees most influenced and accepting Safety Prevention aspects are 'Safety related issues raised in various audits / inspections are liquidated' and 'Safety performing observations helps to employees for personal safety'.

Suggestions

The BBS and safety culture program has continuously highly helpful to various industries' workers safety, employees' betterment and safety purpose. Now a days the BBS management has serve to industries in way of improved model based upon environmental, technology changes, and BBS management system has making them to be highly effective and successfully to the industries.

The study suggests to the organization, in the aspects of Safety Prevention, like the organization should keen monitor the SPOC (Specific Point of Contact) system raising safety issues and Superiors should often observe work practices for protecting safety and health. In addition, the organization should be announced workers like precise Safe Operating Procedures (SOP's) for using equipment / machines.

Conclusion

From the study the Organizations make becoming progressively aware of need to provide workplace that is not only free of common injuries, further more protects workers, conveniences, & environment from consequences of more serious incidents involving safety Prevention, security, environmental, & other risks.

Reference

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