

Occupational Health and Safety of Worker on Workplace: A Systematic Review

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Abstract

The purpose of this paper to review some major studies to determine the relation between the safety climate and safety of an organization. Safety climate acts as a demonstrator of safety level in an organization. Improvement of the safety of an organization like by subjugating the risk-taking behavior of the employee, by improving the safety performance of worker, by scale down the underreporting of injuries and accidents only possible by positive safety climate. Most of the studies show that the positive safety climate is associated with the improved safety of an organization which at last long decreases the risk of workplace injuries and accidents.

Keywords- Work Environment, Worker's Health and Safety, Safety Training, Small and Large Scale Industries, Management, Safety Behavior

I. INTRODUCTION

Worker's welfare is the most important matter for the business to convert a world class contestant in the whole world. The fundamental factor for loss of finance or life or both is job-related accidents. According to ILO, around 4 percent of the world GDP cost by occupational accident and injuries. The formidable calamities, like Piper Alpha, Bhopal gas tragedy and Chernobyl has become the reason of thousands of deaths. By old practices, safety research was totally focused on the individual attributes such as attitude, traits and behavior. But major disaster, such as Bhopal gas tragedy has illustrated the significance of management practices and work climate as contributors to system fail. According to the global estimates, work-related accidents and work-related illnesses result in over 2.3 million fatalities yearly. In 2010, there were over 350,000 fatal occupational accidents and over 1.9 million fatal work-related diseases. Consequently, approximately 6,300 people die every day because of these causes. Resultant, attention has been given to the function of management practices and work environment as determinant of safety in the workplace.

II. LITERATURE REVIEW

A. Impact of Safety Climate on Occupational Safety

[1]Griffin & Neal (2000) found in their study on manufacturing and mining industry that through the motivation about safety and perception of knowledge, elements of safety performance related to the safety climate. Worker's safety behavior can improve, we should heighten their knowledge and attentiveness towards the work safety and we should motivate them to take participation in safety related events.

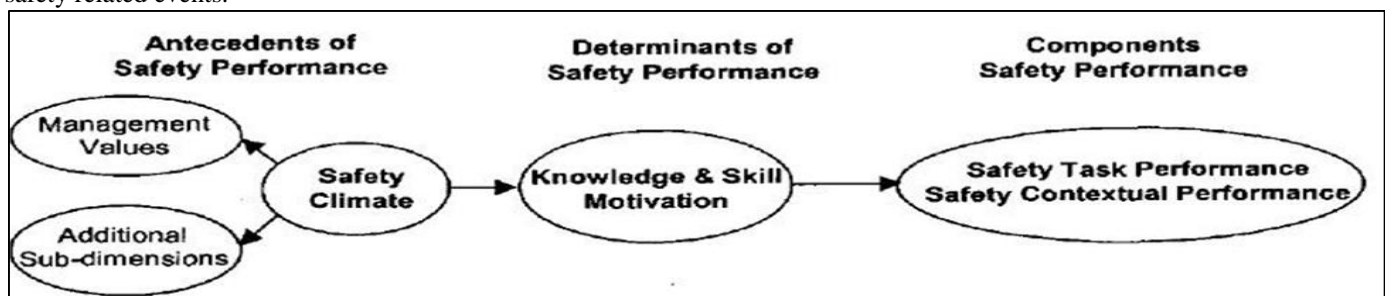


Fig. 1 (a): Theorized model of safety performance

By using (SEM) they found the relationship b/w safety performance, knowledge, motivation, and safety climate

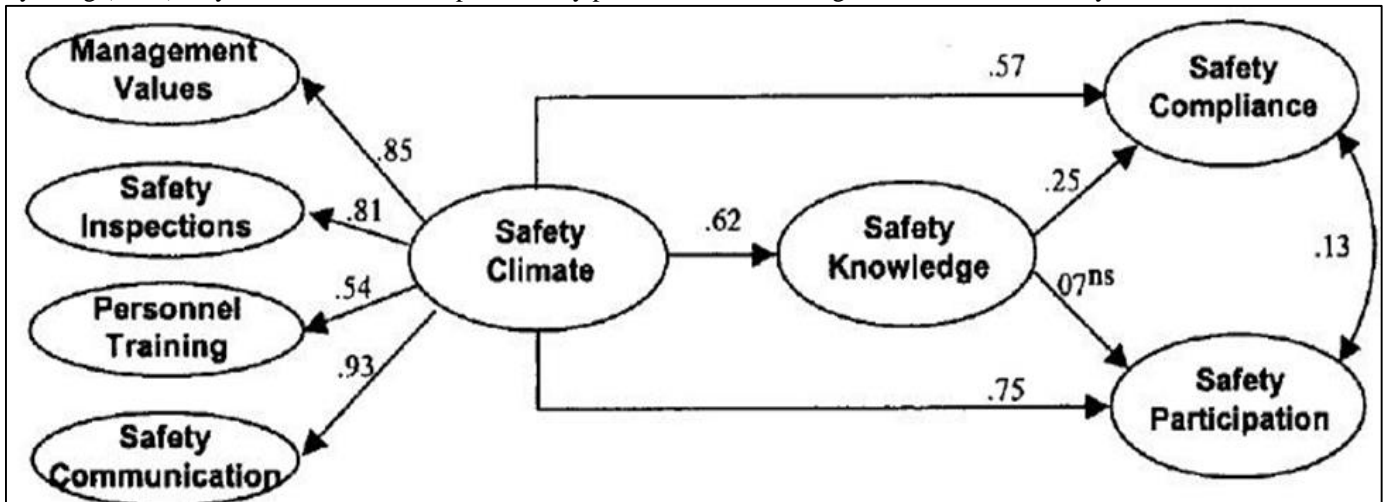


Fig. 1 (b): Actual model

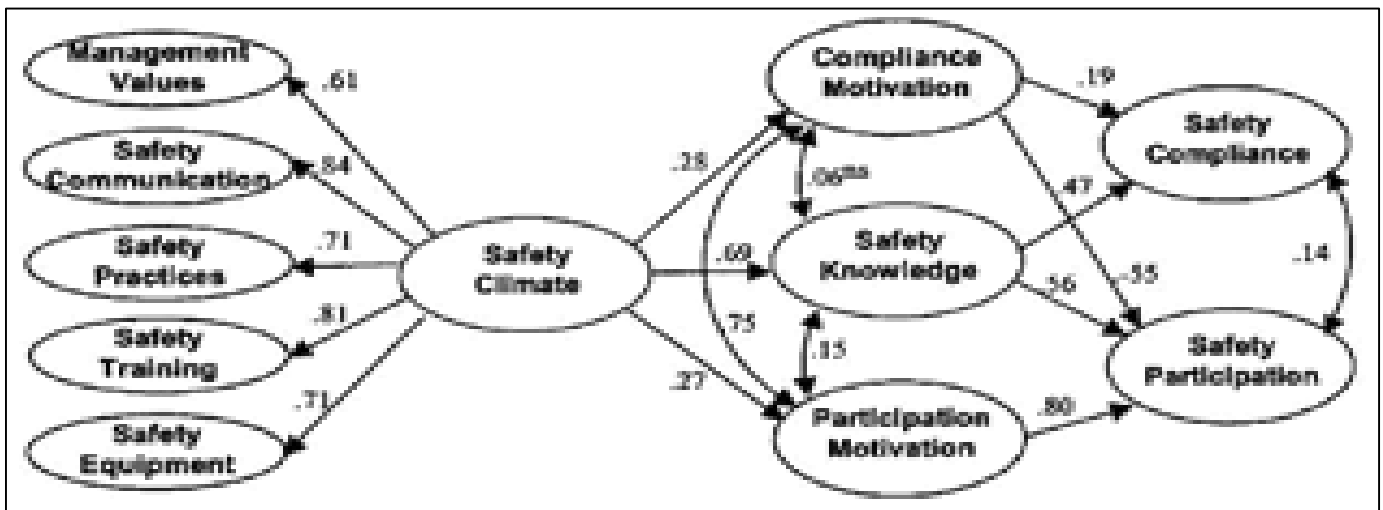


Fig. 1 (c): Model shows linkage between, its determinants, safety climate and safety Performance

Result show that to enhance the safety performance organizations should focus to improve the knowledge and motivation of workers.

[2]U. Varonen, M. Mattila (2000) found that the safety climate correlated with level of safety of the work environment and safety practices of the companies, and the correlativity of safety level and safety climate of work environment was stronger. They also found that better safety climate of the organization lesser was the accident rate the accident rate.

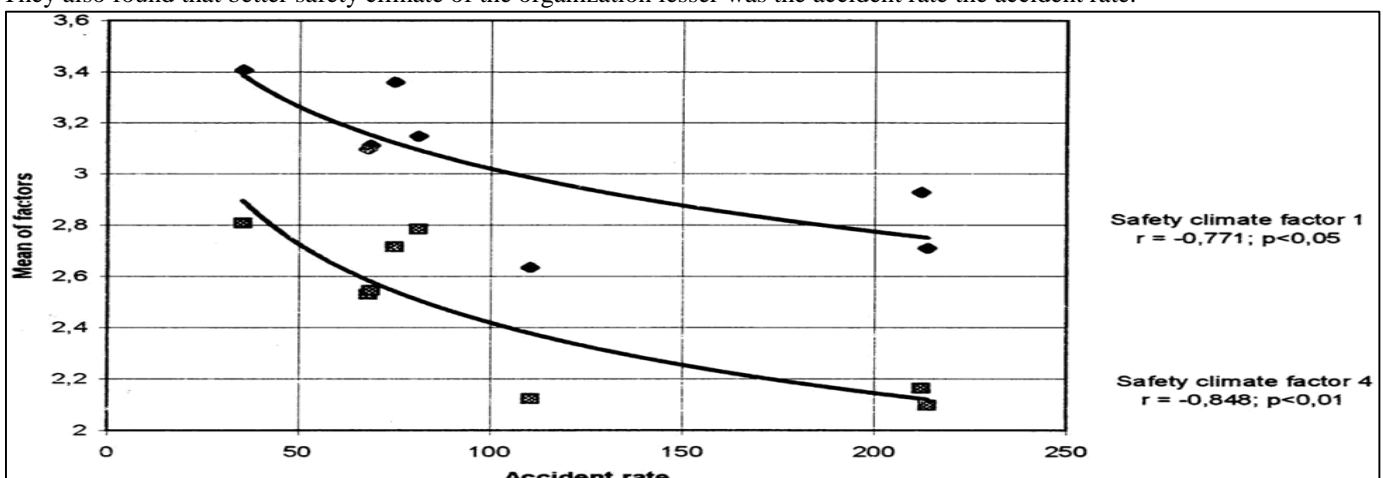


Fig. 2 (a): Relationship between means of two factors and Accident rate

[3] Neal et al. (2000) conduct their study in Australia on large hospital and conclude that the safety climate of the organization effected by general organization and eventually it effects the performance of worker. The results suggest that specific climate for safety is more strongly related to the safety performance than general organization climate.

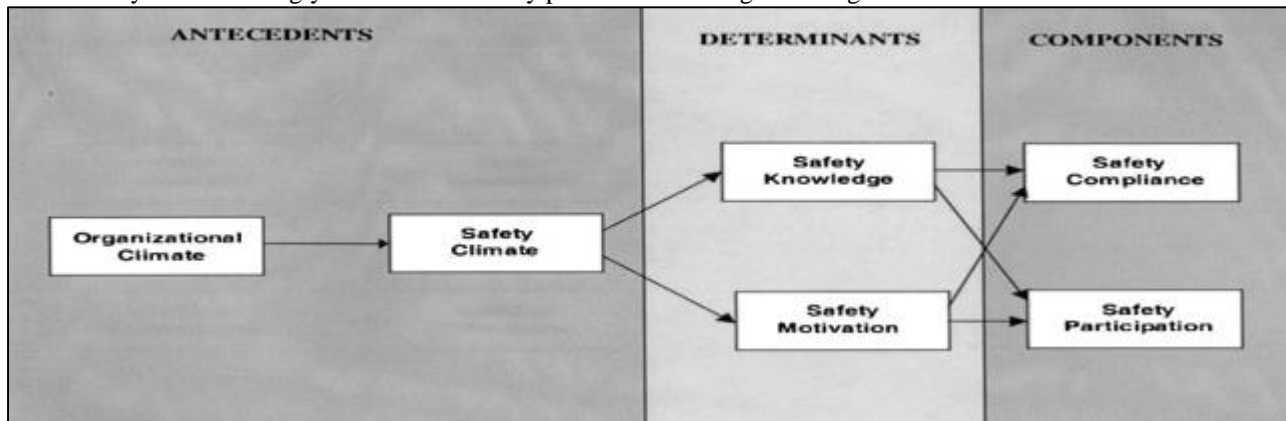


Fig. 3 (a): Hypothesized model of construct

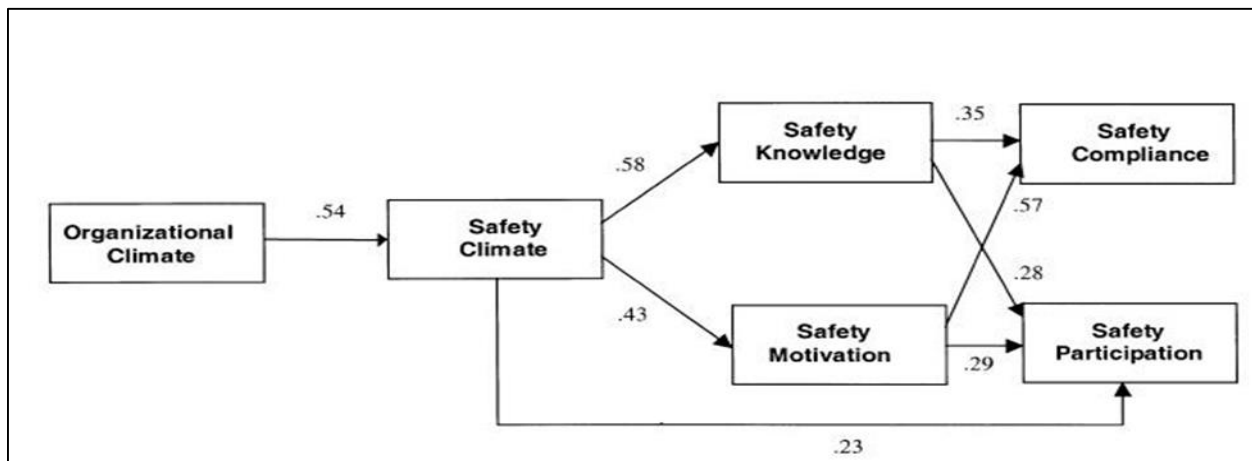


Fig. 3(b): Final model from structural equation modeling (SEM) analysis

This model represents that through specific climate for safety, safety performance and general organizational climate related to each other. It suggests that to meliorate safety behavior of worker organizations should find better ways to improve safety climate.

[4] D.M. Dejoy et al. (2004) found in their study there is strong relation between organizational support towards safety, communication related to safety and safety related policies and programs and their effect is direct.

Table 1: Hierarchical Regression analysis

Hierarchical regression analyses – predicting safety at work					
Step and predictor	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1					
Age	.071***	.042***	.033**	.041***	.040***
Gender	-.035	-.029	-.035	-.050	-.047
Tenure	-.084**	-.008	-.010	-.017	-.019
Hours worked	.001	.003	.003	.002	.001
R ²	.018				
Step 2					
Environmental conditions		-.424***	-.357***	-.315***	-.296***
R ²		.214			
Δ R ²		.196			
Step 3					
Safety polices and programs			.246***	.149***	.067*
R ²			.255		
Δ R ²			.041		
Step 4					
Organizational support				.154***	.115**
Coworker support				-.005	-.021
Participation – others				.051*	.053**
Participation – supervisor				-.026	-.031
Communication				.049	-.009
R ²				.276	
Δ R ²				.021	
Step 5					
Safety climate					.251***
R ²					.294
Δ R ²					.018

Reported coefficients are unstandardized. Constants (intercepts) have been omitted.

The outcome conclude the negative relation between environment exposures and safety at work ($b=-.42$). Support by organization, safety related strategies and programs are positively and significantly related to occupational safety.

[5] Andrew Neal & Mark A. Griffin (2006) conducted their study on safety climate, motivation and behavior at two points in five years in which they concluded that safety climate change the safety motivation of worker which ultimately change the safety behavior of workers. Secured and modified behavior of workers reduces the number of accidents.

[6] T.M Probst et al. (2008) found in their study that according to the submitted report to OSHA, the injury rate was only 3.11 per 100 workers; the rate of eligible injuries that was not reported to OSHA was 10.30 injuries per 100 workers. Constructive safety climate reduces the organizational injury underreporting. They calculated that for every OSHAS form reported injury, there were 3.5 injuries more that require medical concern therefore should include in OSHA injury form.

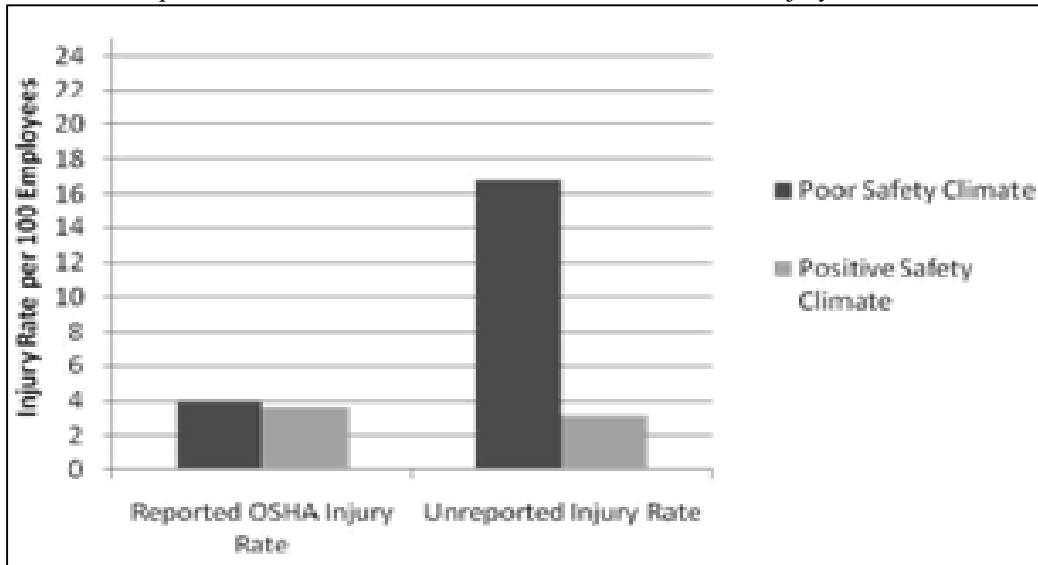


Fig. 6 (a): Unreported injury rate

[7] M. N. Vinodkumar, M. Bhasi (2009) using exploratory factor analysis, examines eight factor of safety climate. They also constitute significant negative relation correlation between workplace accidents and safety climate in chemical industry in India.

[8] T.M. Probst, A.X. Estrada (2010) found in their study that the accident reported to the organization is less than unreported accidents. The calculated ratio for every unreported accident to every reported accident was 2.48:1. They also set up the result that the correct implementation of safety-related policies by the supervisor by improving workers perception regarding occupational safety, the unreported accident can be reduced. They also found that the scarcity of communication between employee and management commitment to safety are some fundamental reasons of accident underreporting.

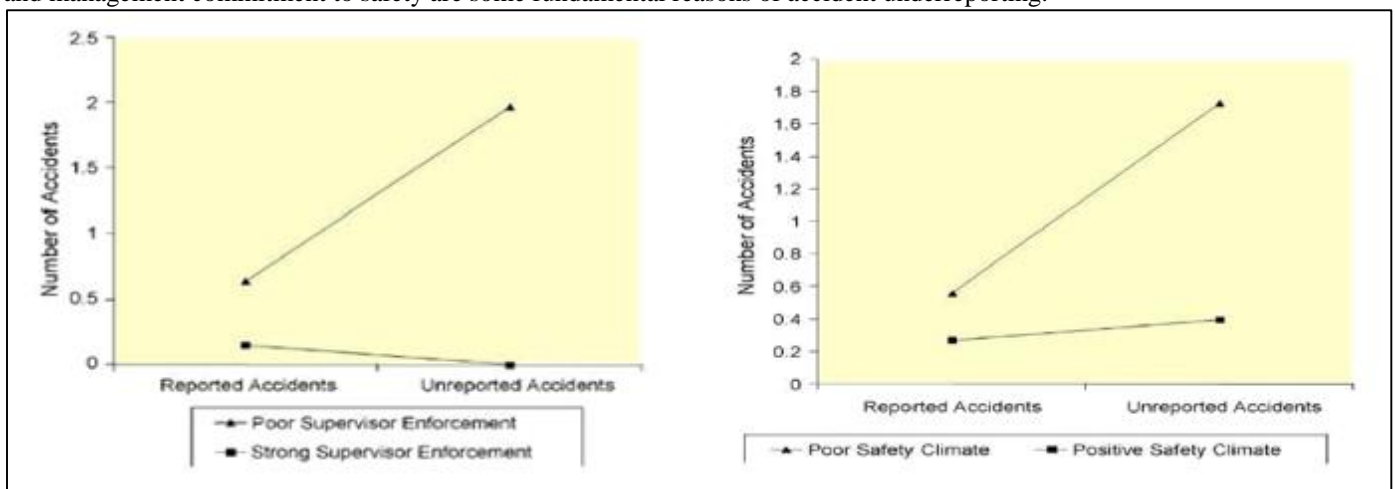


Fig. 8 (a): Comparison of number of accidents in poor safety climate and positive safety climate

Due to underreporting of accidents organizations are not able to find out the root causes of accidents or injuries.

[9] Jeremy M. Beus et al. (2010) studied meta-analytical relationship between safety climate and injuries and proposed that injuries were supplementary predictive of perception of workers than perception of worker was prognostic of injuries. They also found that as the period of time over which injuries were evaluated increased, the relationship between safety climate and

injuries is attenuated. Results are consistent with theory, not only safety climate associated with future injuries but the converse is also true, such that individuals appear to recalibrate their perceptions organizational safety following injuries.

[10] X. Liu et al. (2015) found the link among various dimensions, safety behavior, and workplace injuries for manufacturing sector. They found that attributes of safety climate are management commitment, co-worker support, safety supervision, and given training to workers. They constitute that the safety behavior of worker intercedes the relationship between safety climate and occupational injuries.

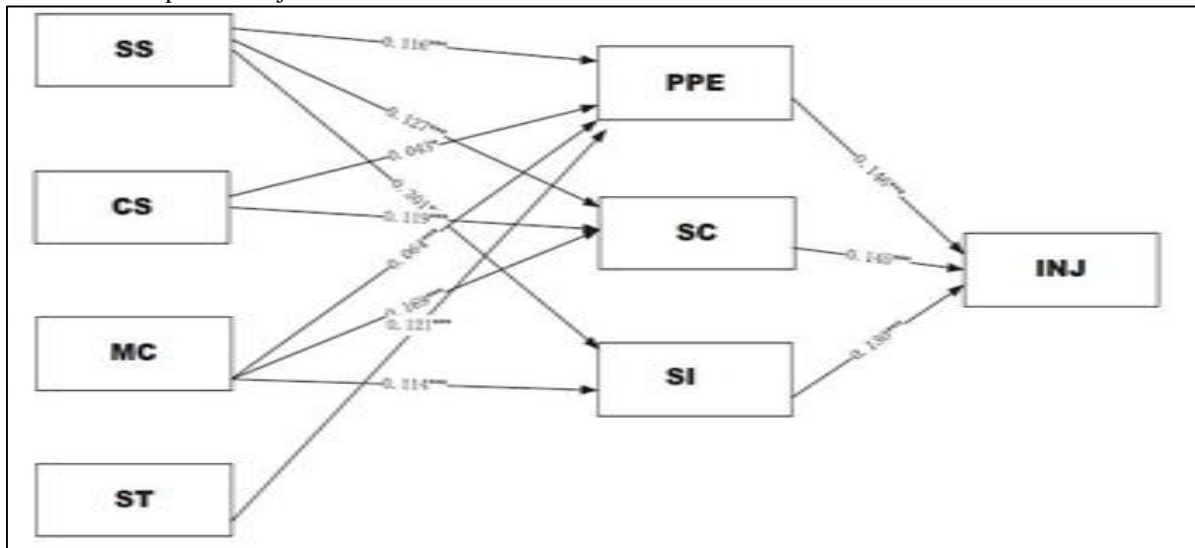


Fig. 10 (a): Relationship b/w various factors in a manufacturing industry

[11] S. Unnikrishnan et al. (2014) conduct a survey to find out the safety practices in SME's in India and conclude that there is a deficiency of safety management practices. They found that less risk, better efficiency, market competitiveness, and stringent laws are the main causes of safety innovation and financial constraints, less awareness, lack of training, not ready to change, are the main barriers of safety innovation.

[12] Boughaba et al. (2014) establish a safety culture assessment of two petrochemical plants, Company A, and company B and constituted manager's commitment, training, communication, and employee involvement basic dimensions of safety culture. Due to the better safety culture, the safety performance of Company A is better than Company B, and the rate of the accident of Company A is less than Company B. They also concluded that the better performance of Company A is just because of importance is given by the management to safety is more than Company B.

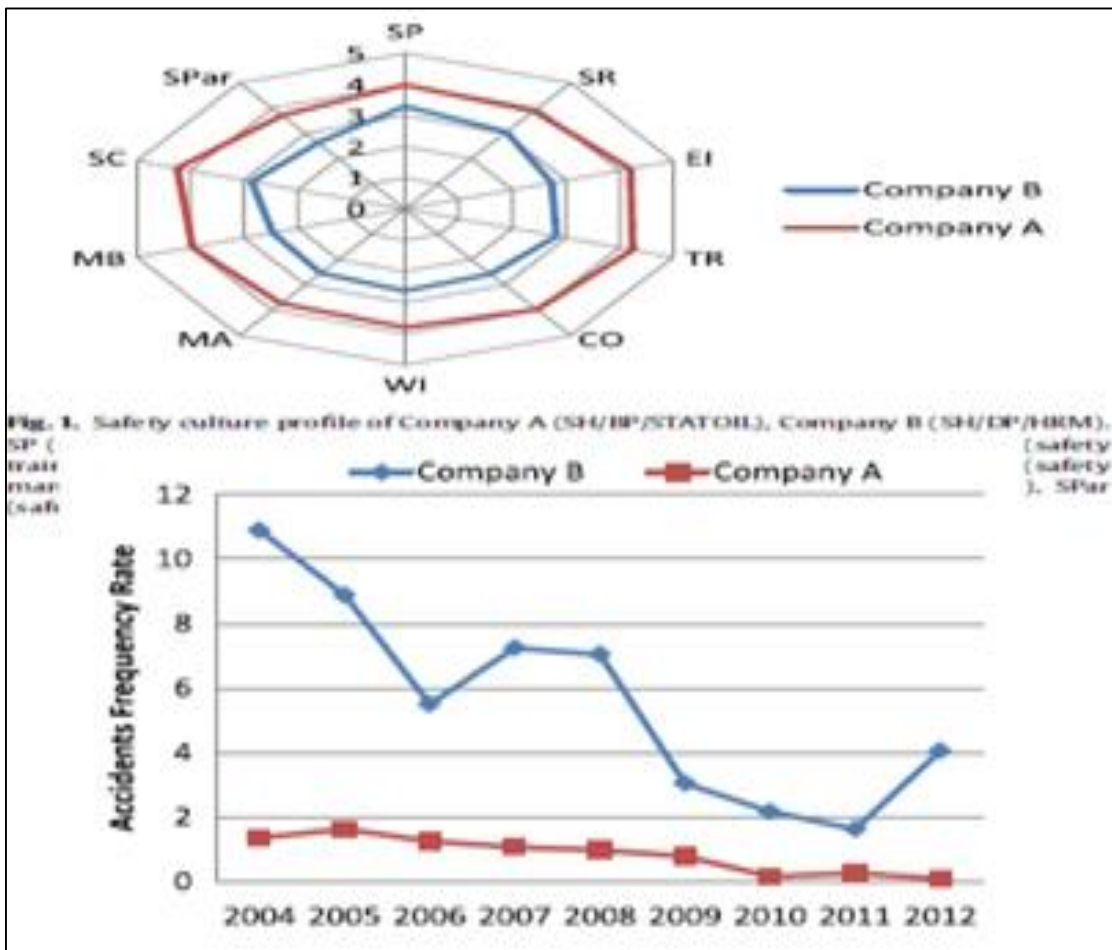


Fig. 12 (a): Comparison of safety culture of two companies and accident frequency rate

[13]H. Nordlof et al. (2015) they works on large steel manufacturing company find out the reasons for the risk-taking behavior of worker. They conclude five reasons for the risk-taking behavior of the employee that are 1) Acceptance of risk that is one simply has to accept the safety risks of the work environment. 2) Individual responsibility for safety. 3) Trade - off between productivity and safety. 4) Importance of communication. 5) State of the day and external conditions.

Table 2: Reasons for risk taking

The main results of the study: A description of safety culture and reasons for risk-taking at a large steel manufacturing company.	
Categories	Subcategories
Acceptance of risks	Danger tolerance Fatalistic beliefs
Individual responsibility for safety	Up to the individual Low company commitment
Trade-off between productivity and safety	Management expectations Worker expectations Practical obstacles
Importance of communication	To think about safety Collaboration between colleagues Reporting incidents
State-of-the-day and external conditions	New at work Tiredness Nonchalance Routine Low staffing High pace

III. CONCLUSION

The purpose of this paper was to go over the previous studies to set up a relationship between safety climate and safety in an organization. It has been studied that there are many ways in which safety climate effect the safety in an organization. Knowledge and motivation are the key functions of safety climate and directly affects the safety performance of the worker. Safety compliance and the safety participation of the worker in safety programs is improved due to positive safety climate due to which rate of accidents and injuries decrease. Safety climate also affects the injuries and accident behavior of worker. Underreporting of injuries and accidents is due to the poor safety climate in an organization. Underreporting of accidents is the significant barrier to finding out the root cause of accidents and injuries. Safety climate is directly proportional to accidents.

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