Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 3): pp. 5062-5077
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2021.03.518

Impact Of Safety Climate On Safety Behavior Of Employee Study Of Manufacturing Unit

Neeraj Gautam Research scholar Department of Humanities and Social Sciences
Motilal Nehru National Institute of Technology, Allahabad.

Abstract
Goals of occupational safety and health programmes include fostering a safe and healthy work environment. OSH may also protect co-workers, family members, employers, customers and many others who might be affected by workplace environment. In the United States the term occupational health and safety is referred to as occupational health and occupational and non- occupational safety and includes safety for activities outside work. In common-law jurisdictions, employers have a common law duty to take reasonable care for the safety of their employees. Statute law may build upon this to impose additional general duties, introduce specific duties and create government bodies with powers to regulate workplace safety issues.
Organizations and working cultures which support health and safety at work also promote a positive social climate and smooth operation in the process and enhance productivity of undertakings. The concept of working culture is intended in this context to mean a reflection of the essential value systems adopted by the undertaking concerned. Such a culture is reflected in practice in the managerial systems, personnel policies, and principles for participation, training policies and quality management of the undertaking.

Keywords: Safety Climate, Occupational safety, Health, Social climate, Working cultures.

Introduction

Occupational Safety and Health (OSH), also commonly referred to as Occupational Health and Safety (OHS) or Workplace Health and Safety (WHS), is an area concerned with the safety, health and welfare of people engaged in work or employment. There is growing international evidence that points to the link between health risk factors and productivity and health care costs. Thus Occupational Safety and Health and the goal of preserving and maintaining specific working standards are drawing increasing attention by policy makers (Drakopoulos et al., 2012). According to Leman et al. (2010), OSH provides a working environment conducive to safety and health at workplace. Reasonable precautionary steps are taken so as to ensure that workers are prevented from injury or health hazards due to work activities carried out. It requires commitment of the proprietor or owner to ensure the following three conditions in the workplace (OSHA, 1994):

• Companies should have a policy statement on OSH.

•Companies should have a plan for the implementation of hazard identification, risk assessment, and risk control including training and auditing.
Companies should take remedial action for any improvement to be made.

Need for Research

According to Zanko et al. (2012), the growth in the number of specialists in OHS has resulted in an emphasis on policy and practice away from more scholastic concerns previously addressed by academics in the disciplines of psychology and sociology. A hiatus has occurred, and this is evidenced by the general absence of studies in management, even though OHS is increasingly seen as a key operational and strategic concern of business organizations. These authors call for OHS to be placed firmly on the research agenda of management scholars, and advocate the need for greater conceptual development, empirical study and theoretical reflection to complement existing pragmatic concerns of OHS specialists.
Further, few studies have examined impact of safety climate on safety behaviour of employees in Indian context. This study examines the possible inter-relationships between individual and organizational factors of safety climate and safety behaviour of employees of a manufacturing organization. This research makes a contribution to safety literature by showing how individual and organizational factors of safety climate may be related to employees 'safety behaviour, and also by examining possible mediation in the relationship between individual factors and safety behavior by organizational factors of safety climate.

Review of Literature

Studies of safety have suggested that management involvement is important for safety work within companies (Skotnes, 2014). If management is engaged, it will be aware of the need for measures to comply with the laws and assure that safety and security measures are implemented. Traditionally on the job preventive action included little more than adjusting working conditions to the limitations of individual workers.Granerud (2011) is of opinion that traditionally occupational health and safety prevention and research has been concerned with hazards and how these can be avoided or minimized through legal requirements and penalties in combination with risk management at workplace. In recent decades, new kinds of management systems building on voluntary incentive strategies, the so-called soft regulation, have gained increased attention and have reached the management of health and safety. Shannon et al. (2001) point out that it was research into major catastrophes such as Union Carbide (India) or Challenger (USA), where conventional prevention worked, that highlighted an increasing need to device new workplace accident prevention models. Starbuck and Farjoun (2005) clearly illustrate the need of supplementing traditional safety practices (inspections) with the management of organizational learning when describing the Columbia disaster in 2003.

Need for Industrial Health and Safety

Maintaining safe and healthy work conditions is a need for every organization, small or big. A negligent attitude towards these aspects may result in various types of problems for organizations and workers. According to the Health and Safety Authority (HSA), Ireland, accidents and ill- health can result in losses to an organization in terms of money, time, skill, public image, besides the hassle of being involved in legal proceedings (www.hsa.ie).

Financial loss: Whatever may be the nature of accident or ill-health resulting out of work, an organization has to bear heavy cost for it. There could be a loss of physical assets like machine and material, besides harm to workers. Moreover, a large amount of compensation is required to be paid to the victims in compliance with legal enactments. Besides these direct costs, there may be indirect costs arising out of accidents. There is loss of productivity; manpower lost is required to be replaced through fresh recruitment and these workers must be trained before they start working on machines or equipment. Such recruitment and training process would again have cost implications.

Time loss: When an accident takes place, work may be stalled for some period. Time and efforts are also required for fulfilling formalities laid down in the Employees' Compensation Act, 1923.Production may get behind schedule as a result of such activities.

Skill loss: Employee skill is an asset for any company, and is in fact a differentiating factor with other companies in the same industry. Little negligence on the part of management or workers may result in accidents or ill-health that may cause partial or permanent disability in workers, and in many cases, even death. Thus, an organization loses its human asset and skills due to these conditions.

Hassles of legal proceedings: Involvement in legal proceedings may consume a lot of time, energy and resources for an organization. For example, in the case of Union Carbide disaster in Bhopal, it took twenty six years for the verdict of the Supreme Court of India to see the light of the day (Business Standard, 2011).

Tarnished public image: Accidents at workplace not only result in material losses, but also tarnish the public image of the organization.

Safety Climate

Zohar (1980) defines safety climate as the coherent set of perceptions and expectations that employees have regarding safety in their organization. Safety climate is a specific form of organizational climate, which describes individual perceptions of the value of safety in the work environment (Neal et al., 2000). It has been measured in various industrial sectors including construction (Dedobbeleer and Beland, 1991; Gillen et al., 2002), manufacturing (Zohar, 1980), airport ground handling (Diaz and Cabrera, 1997) and healthcare (DeJoy et al., 2000). In traditional industries, the concept of safety climate is a key organizational characteristic in understanding how safety rules and procedures affect the organization's safety performance (Zohar, 2002 .Psychological safety climate reflects individual perceptions of safety policies, procedures and practices in the workplace (Christian et al., 2009). These non-aggregated perceptions of the work environment (Clarke, 2009) differ from safety climate at the group or organizational level, which represent collective perceptions of workplace safety.

Although safety climate has traditionally been conceptualized and operationalized at organizational level (e.g. Zohar, 1980), there is growing evidence for the informative and predictive nature of safety climate at both workgroup and individual level (Zohar, 2003; Zohar and Luria, 2005; Neal and Griffin, 2006). While similar to safety culture, safety climate is a distinct construct. Safety culture is defined as shared values and beliefs that interact with an organization's structure and control systems to produce behavioural norms (Reason, 1998; Thompson, 1996). Safety climate, on the other hand, focuses on workers' perceptions. In other words, safety climate can be viewed as a measurable marker of safety culture (e.g., Huang et al., 2013).

Safety climate is an important indicator of safety performance and is used for predicting safety related outcomes such as safety behaviour and occupational accidents/injuries (Melia et al, 2008; Olsen, 2010). Many studies have investigated into construction of a safety climate in organizations. However, they have not reached a common agreement on safety climate dimensions (Chen and Chen, 2012). Management commitment to safety is a common dimension for safety climate (Evans et al, 2007). Seo et al (2005) indicated that safety climate dimensions can be categorized into five themes: management commitment to safety, supervisor safety support, coworker safety support, employee participation in safety decision making and activities, and competence level of employee with regard to safety. Safety communication, safety training, supportive and supervisory environments, in addition to safety rules and procedures were found as other dimensions of the safety climate (Flin et al. 2000; Evans et al, 2007).

Safety Behaviour

In their model of safety behaviour, Griffin and Neal (2000) and Neal and Griffin (2006) have made a distinction between two types of individual behaviour: safety compliance and safety participation. Safety compliance describes the core activities that need to be carried out by employees to maintain workplace safety (e.g., using patient lifting devises or adhering to incident reporting procedures). Safety participation refers to behaviours that do not directly contribute to an individual's personal safety, but which do help to develop an environment that supports safety (e.g., addressing physically dangerous behaviour or offering a listening ear to co-workers).

In recent decades, it has been well documented that safety climate is related to safety behaviour and unintentional injuries in workplaces in Western countries. A recent meta-analytic review revealed that safety climates offer robust predictions of objective safety criteria (the occurrence of occupational injury) and subjective safety criteria (better self-reported safety behaviour) across industries (Clarke, 2006a) and countries (Christian et al., 2009). Moreover, it was found that a positive safety climate can encourage safe performance either through rewards or through principles of social exchange (Zohar, 2000; Clarke, 2006b) and that safety climate might indirectly affect safety behaviour through some mediation variables (Griffin and Neal, 2000; Zohar and Luria, 2003). A number of studies have showed that safety climate was directly associated with safety performance (Zohar, 2000; Siu et al., 2004; Smith et al., 2006; Clarke, 2006a; Wu et al., 2008; Brondino et al., 2012; Zohar et al., 2014). In contrast, Clarke found that safety

climate was significantly related to safety behaviour (i.e., safety participation and compliance), but weakly related to occupational injuries (Clarke, 2006a).
Safety behaviour and perception of safety can offer alternative measures for determining workplace safety (DeJoy, 1994; Hofmann et al., 1995; Janssens et al., 1995). The use of proactive measures of workers' perception of safety is considered to be a most useful indicator of safety performance (Borman and Motowidlo, 1993). The term safety compliance is used in Neal et al.'s (2000) study to describe the core activities that need to be carried out by individuals to maintain workplace safety. These behaviours include adhering to standard work procedures and wearing personal protective equipment in a safe manner (Broadbent, 2004; Zhou et al., 2008). Safety participation describes behaviours that do not directly contribute to an individual's personal safety but which help to develop an environment that supports safety. These behaviours include activities such as participating in voluntary safety activities, helping coworkers with safety-related issues, and attending safety meetings (Neal and Griffin, 2002, 2006; Broadbent, 2004).

Safety Culture

Culture is a complex construct which has many definitions and perhaps the characteristics which have endured through most or all of these are that culture is a learned set of values which may take the form in an organization of practices interpreted through rules and norms of behaviour (Hofstede, 1991). Clarke (2003) defines safety culture as the core assumptions and beliefs that organizational members hold concerning safety issues. This is expressed through the beliefs, values and behavioural norms of its managers, supervisors and workforce and is evident in company safety policy, rules and procedures. The essence of this definition is the sharing of common beliefs and values that safety is a priority. Effective safety can only be achieved when there is a proper management of interaction between technological systems and people. Reason (1998) argues that an organization's safety culture is ultimately reflected in the way in which safety is managed in the workplace. The OECD Nuclear Agency has defined safety culture as "an organizational atmosphere where safety and health is understood to be, and is accepted as, the number one priority" (INPO, 2013). The Agency refers to a safety culture as one where safety is "an overriding priority". Safety culture has been described as learned behaviour, and those beliefs in the necessity, practicality and effectiveness of controls, attitudes and risk perceptions which makes people think safely and trust in safety measures, or as characteristics and attitudes in organizations which result in safety issues being a priority (IAEA, 1991; Lee, 1993; Booth and Lee, 1995). A definition accepted by many researchers is that of HSC (ACSNI, 1993, p. 23): "the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization's health and safety management...characterized by communications founded on mutual trust, shared perceptions of the importance of safety and by confidence in the efficacy of preventative measures. Safety culture is believed to be a key predictor of safety performance (Cox and Cox, 1991; ACSNI, 1993), but remains a concept with no clear definition or measurement (Cox and Flin, 1998). According to Shannon et

al. (1997), it has become apparent that a safety culture, or lack thereof, can have a significant impact on a company's safety performance. Having a culture that embraces safety as a value does not just happen; it needs to be forged. It must be made a priority and receive attention, energy and resources just as other critical success factors in the organization do (Reason, 1998).

Safety culture has often been used interchangeably with safety climate, although the two may be distinct, climate reflecting attitudes, perceptions and beliefs whilst culture is more complex, reflecting values and norms and being evident in safety management practices (Mearns and Flin, 1999). Although there is still no consensus whether culture applies to a whole organization or to smaller groups within it (Harrison, 1972; Handy, 1985; Hofstede, 1991), recent evidence in relation to safety culture suggests that it differs conceptually for different groups of workers (employees, contractors, work gangs, etc.) in the organization, and specifically between management and shop floor workers (Chute and Weiner, 1995; Beck and Woolfson, 1999; Harvey et al., 1999). Many commercial airline accidents stem from the fact that cockpit and cabin crews represent two distinct and separate cultures and this separation serves to inhibit satisfactory teamwork which can result in lack of communication and co-ordination (Chute and Weiner, 1995). It is thus quite possible that accidents within an organization could be due to the existence of more than one safety culture which inhibits cooperation. A good example of this could be between management and shop floor workers where there is often a lack of understanding of each other which could lead to antipathy and miscommunication (Clarke, 1999).

Attitudes and behaviour have been causally linked (e.g.,Fishbein and Ajzen, 1975; Ajzen, 1991; Hanisch et al., 1998) and attitudes and safety behaviour are not likely to be exceptional to these theories. Attitudes, defined as stable predispositions, are the most comprehensive and useful indicators of a safety culture (Cox and Cox, 1991; Lee, 1994; Williamson et al., 1997). Indeed, Donald and Canter (1994) found a significant correlation between safety attitudes and accident rates. It is therefore argued that attitudes may change behaviour and thus directly and indirectly affect safety culture and accident rates, such influence being greater or less depending on the context, or other psychological factors such as perception of risk.

There have been several attempts to define the factors which constitute a good safety culture, all of which contain the themes of commitment by both management and workforce, leadership style and communication, individual responsibility, management responsibility, risk awareness and risk-taking (Cox and Cox, 1991; IAEA, 1991; Ryan, 1991; ACSNI, 1993; IOSH, 1994; Diaz and Cabrera, 1997; Cheyne et al., 1998; Harvey et al., 2001).

Safety Policy

Safety policy refers to the extent to which a firm creates a clear mission, responsibilities and goals in order to set standards of behaviour for employees, and establishes a safety system to correct workers' safety behaviours (Lu and Yang, 2010). Development of a safety policy demonstrates the organization's commitment to safety, and formally expresses objectives, principles, strategies and guidelines to follow with respect to safety

behaviour in the workplace (Fernandez-Muniz et al., 2007). Safety policy can help to create and significantly influence workers' safety behaviours (Barling et al., 2002; Mullen, 2004; Fernandez-Muniz et al., 2007; Lu and Tsai, 2008; Lu and Yang, 2010). An organization should provide a clear and meaningful statement of its safety policy, which should reflect the organization's safety management, including the ultimate goal of 'zero' accidents and meeting safety objectives as established by the authorities (Santos Reyes and Beard, 2002).

Safety Motivation

Zohar (1980) indicated that an individual's safe work behaviour is influenced by safety motivation. People can be motivated to modify their behaviour to conform to a cultural norm if it is perceived that compliance will lead to a desired outcome (O'Dea and Flin, 2001; Vredenburgh, 2002). Safety motivation reinforces workers' safety behaviours, encourages workers' participation in safety meetings and setting safety goals, and encourages workers to provide safety suggestions that enhance safety performance (Griffin and Neal, 2000). Informational (feedback, self-recording), social (praise, recognition), and tangible reinforcements (trading stamps, cash bonuses) have been used in safety motivation as well as nonmonetary privileges (Komaki et al., 1978).

Well-designed safety motivation offers recognition, which can help to modify safety behaviour. For example, the National Safety Council Motivation and Recognition Programs acknowledge employee safety achievements in the workplace, motivate employees to adopt safe practices, and reward them for staying committed (NSC, 2009). A key characteristic of successful safety motivation is its high level of visibility within the organization. Participants must be able to comprehend what the motivation program is designed to accomplish and how their performance will be measured (Halloran, 1996).

Accidents

Hienrich et al. (1980) describe an accident as an event that is both unplanned and uncontrolled, in which the action or reaction of an object, substance, person, or radiation results in personal injury or the probability thereof. Raouf (2011) defines an accident as any unplanned occurrence which results in injuries, fatalities, loss of production or damage to property and assets. Haddon (1964) views an accident as an unexpected occurrence of physical damage to any animate or inanimate structure. According to Ghiselliand Brown (1948), an accident is an event that takes place without foresight, and results in some type of personal injury and/or damage to equipment and property. Table 2.1 presents industrial injuries in factories, incidence rates and frequency rates in Indian industries from 2002 to 2011.

Causes of Accidents

Accidents do not occur without any reason; there are preceding circumstances involving humans, situations and machines that result into accidents. Sometimes, there is an inherent risk involved in the nature of the job itself. ILO (n.d.) defines risk as "a

combination of the likelihood of an occurrence of a hazardous event and the severity of injury or damage to the health of people caused by this event".
Factors giving rise to accidents may be divided into two categories: human factors and mechanical factors.

A. Human Factors

Human factors include those causes of accidents which are related in some way to humans and account for one of the most important causes of accidents. For example, it was reported that 62 per cent of the accidents between 1994 and 2004in Indian Railways were caused due to failure of Railway staff. The reason for occurrence of human error may be attributed to both physical and psychological factors (Cooper and Volard, 1978). Human errors have been differentiated by Reason (1990) as: active failures, that immediately precede an accident, usually caused by frontline workers, and latent failures, that precede active failures, and are usually management- related factors, for example poor supervision. According to Male (2003), human factors contribute to causation of accidents in various ways, which include, among other aspects, designing the job and the way of managing various systems like training procedures, etc. Human factors are found at two levels: worker-related and management-related.

a. Worker-Related Factors

Worker-related factors are those causes of accidents that originate from physical, psychological and behavioural aspects of workers. Some of the important causes are:
i. Personality variables: The Accident Proneness Theory says that some people are more likely to have accidents due to the presence of certain permanent personality variables. This theory was supported by Klumb (1995), who had observed that the majority of people never have accidents, while a lesser percentage has one accident and a still lesser percentage experiences large number of accidents. It is the third category of people who possess the personality characteristics of accident-proneness.
ii. Attitudinal problems: Presence of certain attitudes affects safety at workplace. A general careless attitude towards work and things, laziness, clumsiness, etc. all impact workplace safety. Employee attitudes have been found to be an indicator (Cox and Cox, 1991) and component of safety culture (Lee, 1995, cited in Correll and Andrewarth, 2000) in organizations. Several researchers (e.g.,Barling et al., 2002; Gillen et al., 2002) have suggested that a more positive attitude towards safety can help prevent involvement in accidents.
iii. Habits: Certain habits of workers may result into accidents. For example, coming drunk to workplace may be a cause of accidents. Irritable temper and quickly getting into fights are other habits that may directly or indirectly result in getting involved in accidents. Life patterns may also affect safety at workplace. For example, sleeping late at night may result in sleepiness at workplace, thus threatening safety.
iv. Stress: Stress is an emotional state that results from the self-perceived inability of a person to bridge the gap between a desired state and the present state, when the outcomes are important for the person. There is a direct relationship between job stress

and occupational accidents (Trimpop et. al., 2010). Companies consider stress as related to workers' lifestyle, personality and psychological variables, while unions find its roots in excessive or conflicting work demands and poor supervision (Causes and cures for stress still misunderstood, 1990). Work overload is supposed to be the prime cause of industrial stress which may generate a feeling of anger, fatigue, confusion and anxiety in workers (Goetsch, 1993). The indirect effect of stress may be on safety attitudes, as workers may deviate from safe work practices and are likely to commit more errors if they are under pressure to increase production (Clarke and Cooper, 2004). v. Unsafe Acts: Unsafe acts may be understood as those human actions that arise out of errors that are potentially hazardous and can cause an accident. These human errors occur when workers deviate from the standard job procedures and hazard control processes, which may expose them to the risk of accidents (Joel, 1997).
and health, compliance level with statutory standards in factories, and for estimation of various trends.

Objectives

• To find out the effect of individual factors of safety climate (i.e., relationships at work and pressure on an individual) on safety behaviour of employees (including safety participation and compliance).
• To investigate the effect of organizational factors as a mediator on the relationship between individual factors of safety climate of an organization and safety behaviour of employees.

Hypotheses Framed for the Study

Following are the hypotheses framed in order to meet the study objectives:

HI: Individual factors of safety climate influence safety behaviour of employees.

H2: Organizational factors of safety climate mediate the relationship between individual factors of safety climate and safety behaviour of employees.

The following conceptual model (Figure 3.1) between the constructs considered is proposed:

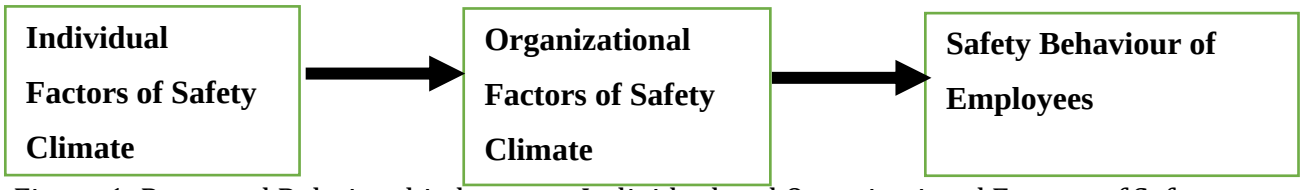

Figure 1: Proposed Relationship between Individual and Organizational Factors of Safety Climate and Safety Behaviour of Employees

Research Design

This study is a questionnaire-based analysis of three components: individual factors of safety climate, organizational factors of safety climate and safety behavior of employees. A manufacturing unit in the private sector located in Allahabad region engaged in the manufacturing of transformers was chosen for the study. Data was collected through a

survey of employees of this unit by using a structured questionnaire consisting of 47 questions. A copy of the questionnaire has been provided as an annexure to this report. The organization that owns this unit is a leader in the power transmission business. It has a diversified product portfolio including power transformers, instrument transformers and gas- insulated switch gears. With a workforce size of nearly 450 permanent and 350 contractual workers, the Allahabad unit was considered to be an appropriate setting for the purpose of the survey designed for this research.

Sampling

Data was collected from employees who have attended various training program.mes during the previous business cycle; these programmes included environmental awareness training, health and safety training, shop quality committee training, production system training, 5S training and Flash 5 training. The duration of such programmes is five days on an average and all are of on-the-job type. Respondent employees of the manufacturing organization were shop floor workers, executives and supervisors and thus represent top level management, middle level management as well as lower level management. Sample size of this study is 120.

Table 1: Cronbach's Alpha for Variables:

S. No.	Construct	Cronbach's Alpha
1	Organizational Factors	0.790
2	Individual Factors	0.649
3	Safety Behaviour	0.629

This table shows the reliability of each construct as measured by Cronbach's Alpha. Typically, values closer to 1 indicate higher internal consistency, with 0.790 being relatively strong, while 0.649 and 0.629 indicate moderate reliability for the other factors.

Analysis and Findings

Demographic Details

Table. 2

Category	Details	Percentage (%)
Age Group (Years)	**<25**	8.3
	25-35	39.2
	36-45	37.5
	>45	15.0
Length of Service (Years)	**Up to 2 years**	12.5
	Up to 5 years	35.8

	Up to 10 years	32.5
	More than 10 years	19.2
Level of Education	**High School**	16.7
	Intermediate	35.8
	Graduation	32.5
	Post-graduation	15.0
Level of Management	**Junior Management**	35.8
	Middle Management	31.7
	Top Management	20.8
	Not Applicable	11.7

Table 3: Means, Standard Deviations, and Correlations

Variables	Mean	SD	Organizational Factors	Individual Factors	Safety Behaviour
Organizational Factors	4.2265	0.32091	1		
Individual Factors	4.1847	0.36495	0.358**	1	
Safety Behaviour	4.5608	0.31883	0.490*	0.408*	1

Note:

- **Correlation is significant at 0.01 level (two-tailed)**: **0.358**
- **Correlation is significant at 0.05 level (two-tailed)**: **0.490** and **0.408**
- Organizational factors are significantly related to individual factors (**r = 0.358, p < 0.01**) and safety behaviour (**r = 0.490, p < 0.05**).
- Individual factors and safety behaviour are also significantly correlated (**r = 0.408, p < 0.05**).
- **Regression Analysis Summary:**

1. **Relationship between Organizational Factors and Safety Behaviour** Hierarchical multiple regression analysis was used to test the hypotheses following **Baron and Kenny's (1986)** mediation conditions:
   Step 1:
   - Predicting the mediating variable (organizational factors) on the independent variable (individual factors).
   - Unstandardized path coefficient for this regression was **a = 0.315, p = 0.000**.

Table 4 : Path Coefficient for the Relationship between Organizational and Individual Factors

Predictor	B (Unstandardized Coefficient)	p-value
Organizational Factors	0.315	0.000

This table shows the results of the regression analysis between organizational and individual factors, with a significant path coefficient (**a = 0.315**) indicating a strong predictive relationship.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.358a	0.128	0.121	0.30092

- **a.** Predictors: (Constant), Individual Factor (Ind_Factor)

Table 6: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.569	1	1.569	17.332	0.000
Residual	10.685	119	0.091		
Total	12.255	120			

- **a.** Dependent Variable: Organizational Factor (Org_Factor)
- **b.** Predictors: (Constant), Individual Factor (Ind_Factor)

Table 7 : Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	2.910	0.317		9.164	0.000
Ind Factor	0.315	0.076	0.358	4.163	0.000

- **a.** Dependent Variable: Organizational Factor

Step 2: Regression Analysis (Individual Factors → Safety Behaviour)

A regression was performed to predict the dependent variable (**safety behaviour**) from the independent variable (**individual factors**). This regression was found to be **insignificant**.

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.108a	0.012	0.003	0.31831

- **a.** Predictors: (Constant), Individual Factor (Ind_Factor)

Table 9: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.141	1	0.141	1.388	0.241b
Residual	11.956	119	0.101		
Total	12.097	120			

- **a.** Dependent Variable: Safety Behaviour (Saf_Behaviour)
- **b.** Predictors: (Constant), Individual Factor (Ind_Factor)

Table 10 : Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	4.955	0.336		14.753	0.000
Ind Factor	0.094	0.080	-0.108	-1.178	0.241

- **a.** Dependent Variable: Safety Behaviour (Saf_Behaviour)

This analysis shows that **individual factors** did not significantly predict **safety behaviour**, with **p = 0.241** indicating an insignificant relationship.

Step 3: Regression Analysis (Independent and Mediating Variables → Safety Behaviour)

A final regression was performed to predict **safety behaviour** from both the independent variable (**individual factors**) and the mediating variable (**organizational factors**). This regression provides estimates for paths **'b'** and **'c'** (the remaining effect of the independent variable when the mediator is included).

- **Path 'b'** (organizational factors → safety behaviour): **B = 0.260, p = 0.007** (significant)
- **Path 'c'** (direct effect of individual factors on safety behaviour): **B = -0.176, p = 0.037** (significant)

Since **path 'c'** is reduced compared to the earlier regression (Step 2), and Step 2 was **insignificant**, it implies **full mediation**. This satisfies **Baron and Kenny's (1986)** conditions for mediation, supporting the hypothesis (**H2**).

Table 11 : Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.267a	0.072	0.056	0.30984

- **a.** Predictors: (Constant), Organizational Factor (Org_Factor), Individual Factor (Ind_Factor)

Table 12 : ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.865	2	0.433	4.506	0.013

Residual	11.232	118	0.096		
Total	12.097	120			

- **a.** Dependent Variable: Safety Behaviour (Saf_Behaviour)
- **b.** Predictors: (Constant), Organizational Factor (Org_Factor), Individual Factor (Ind_Factor)

Table 13: Coefficients

Model	**Unstandardized Coefficients**		**Standardized Coefficients**		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	4.197	0.428		9.814	0.000
Ind Factor	-0.176	0.083	0.202	-2.113	0.037
Org Factor	0.260	0.095	0.262	2.747	0.007

- **a.** Dependent Variable: Safety Behaviour (Saf_Behaviour)

This analysis confirms **full mediation**, meaning the effect of **individual factors** on **safety behaviour** is fully mediated by **organizational factors**.

Recommendations

Safety climate is a predictive measure of safety (Clarke, 2006) and is defined as employee perceptions of procedures and practices relating to safety (Neal and Griffin, 2004). Safety climate also includes management commitment to safety, workplace risks and employee involvement in safe practices (Ikuma and Nahmens, 2014; Changet al. 2013). Safety climate can inform management of the current potential for safety incidents and help identify areas to improve safety. Furthermore, better safety climates are strongly correlated with reduced accident rates (Varonen and Mattila, 2000), making safety climate an important component to measure.

This process yielded an initial model that portrays safety climate as consisting of two sets of factors: organizational factors and individual factors. Of these, organizational factors include management commitment safety and safety policies and programs. These have been considered as both have demonstrated wide generalize ability in the safety climate literature. Management commitment is the extent to which management is perceived to place a high priority on safety and acts upon that priority in an effective manner. Management commitment is probably the most frequently observed dimension in the overall safety climate literature (Clarke, 2010; Zohar, 1980) 2003, 2008; Flinet al., 2000; Guldenmund, 2000; Neal and Griffin 2004).

Safety programs and policies is also a prominent dimension in the safety literature. In some studies, safety programs and policies have been reported as the single largest contributor to safety climate perceptions (DeJoyet al., 2004; Diaz and Diaz-Cabrera, 1997; Zohar, 2003). Within most

Limitations

Limitations are those uncontrolled situations that are unavoidable by the researcher. In this study also certain limitations were encountered. Firstly, the major limitation is that employees of only one organization of Naini, Allahabad have been surveyed. Moreover, the sample size was also not very large; hence generalization of results might be difficult. Legal provision of safety was also another issue that could have been included in the study. Another limitation was that less dimensions of safety were used, which may affect the analysis. Scope for Further Research

A bigger sample size covering more than one manufacturing unit can give better insights on safety climate and behaviour. Including more dimensions of safety can bring new insights. Further, legal provisions of safety in the organization to be studied can also be noted as a component of qualitative analysis. This can bring to light whether organizations are adhering to mandatory safety requirements laid down by legislations like Factories Act, 1948, etc.

References

1. Bosak J., Cotesee W.J, (2013), "Safety climate dimensions behaviour", Accident analysis and prevention. Vol.5, 1
2. Bronkhorst B, (2015) the effects of job demands, resource and safety climate on employee physical and psychosocial safety behaviour", Journal of safety research Vol 55 pp.63-72.
3. Casey. T W., Krauss. A D, (2015), "Effects of national culture on employees' safety-related perceptions and behaviour", Accident Analysis and Prevention, Vol 78 pp. 173–184.
4. Clarke, S. (2010), "An integrative model of safety climate: Linking psychological climate to individual safety outcomes using meta-analysis." Journal of Occupational and Organizational Psychology, Vol 83, pp. 553-578.
5. Clarke, S., 2006a. The relationship between safety climate and safety performance: a meta- analytic review. Journal of Occupational Health Psychology, Vol 11, pp. 315-327.
6. Cooper, M.D., Phillips, R.A, (2004), "Exploratory analysis of the safety climate and safety behaviour relationship", Journal of Safety Research, Vol 35, pp. 497-512.
7. Cox. S.,Tomas, T M,(1998), "Safety culture: the prediction of commitment to safety in the manufacturing industry", British Journal of management, Vol 9, pp. 3-7.
8. Coyle.IR,etal, (1995), "Safety climate", Journal of safety research, Vol26,No.4,pp.247-254. Curcuruto.M.,etal (2015), "The role of prosocial and proactive safety behaviors in predicting safety performance", Journal of Safety Science, Vol.80, pp. 317-323.
9. Dejoy, D M., (1994), "Managing safety in the workplace: an attribution theory analysis and model" Journal of Safety Research, Vol 25, pp. 3-17.
10. Donald, I. and Young, S. (1996), "Managing safety: an attitudinal-based approach to improving safety in organization", Leadership & Organization Development Journal, Vol. 17, pp. 13-20.

11. Flin. R., Mearns. K., (1996), "Measuring safety climate: identifying the common features", Journal of Safety Science Vol.34, pp. 177-192.
12. Glendon. A I., Litherland. D K, (2001), "Safety climate factors, group differences and safety behavior in road construction", Safety Science, Vol 39, pp. 157-188.
13. Griffin, M. A., & Neal, A. (2000), "Perceptions of safety at work: A framework for linking safety climate to safety performance, knowledge, and motivation", Journal of Occupational Health Psychology, 5(3), 347-358.
14. Harvey. J. (2001), "The effectiveness of training to change safety culture and attitudes within a highly regulated environment", Personnel Review, Vol. 30 Iss 6 pp. 615-636.
15. Hassan.A,etal,(2009), "Management practice in safety culture and its influence on workplace injury", Disaster Prevention and Management: An International Journal, Vol. 18 Iss 5 pp. 470477.
16. Hecker S, (2013), "Understanding safety culture and safety climate in construction existing evidence and a path forward", Journal of safety culture/climate workshop, Vol 5, pp.672-687.
17. Hofmann, D.A. and Stetzer, A. (1998), "A cross-level investigation of factors influencing unsafe behaviors and accidents", Personnel Psychology, Vol. 49, pp. 307-39.
18. Imanol Nunez Mikel Villanueva, (2011),"Safety capital: the management of organizational knowledge on occupational health and safety", Journal of Workplace Learning, Vol. 23 Iss 1 pp.56-71.
19. Kouabenan.D R.,Ngueutsa R,(2014),"Safety climate, perceived risk, and involvement in safety management", Safety Science, Vol 77 pp.72-79.
20. Liu. X., etal (2015),"Safety climate, safety behavior, and worker injuries in the Chinese manufacturing industry", Journal of Safety Science, Vol.78, pp. 173-178.
21. Lu.C S., Yang.C S, (2011), "Safety climate and safety behavior in the passenger ferry context", Accident Analysis and Prevention, Vol 43 pp. 329-341.
22. Neal, A., etal (2000) "The impact of organizational climate on safety climate and individual behavior" Journal of Safety Science. Vol 34, pp. 99–109.
23. Sharon Clarke, (2003), "The contemporary workforce", Personnel Review, Vol. 32 Iss 1 pp. 40 57.
24. Vredenburgh, A.G. (2002), "Organizational safety: which management practices are most effective in reducing employee injury rates?" Journal of Safety Research, Vol. 33, pp. 259-76.
25. Yule S.,Flin.R,(2007),"The role of management and safety climate in preventing risk taking at work", International Journal of Risk Assessment and Management, Vol. 7, No. 2, pp.234-245.
26. Zohar, D. (1980), "Safety climate in industrial organizations: theoretical and applied implications", Journal of Applied Psychology, Vol. 65 No. 1, pp. 96-102.
27. Zohar. D., Luria. G, (2005), "A multilevel model of safety climate: cross between organization and group level climates, Journal of applied psychology, Vol 90, No.4, pp.616-628.