

# SIGNIFICANT MANAGEMENT PRACTICES INFLUENCING THE OCCURRENCE OF WORKPLACE INJURIES: THE CASE OF APPAREL INDUSTRY IN SRI LANKA

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## ABSTRACT

*Safety culture provides a basis to understand the state of safety in an organization. Further, it gives considerable contribution to the performance of the industry. The management practices; one of components in safety culture also creates a considerable influence on achieving safety. The reviewed literature proved that there is a relationship between management practices and workplace injuries. Workplace injuries can be identified as the bad consequences of the improper safety handling. However, most of the researches have not focused on in-depth investigation of management practices in safety culture and have not looked at the influence which is created on workplace injuries. Therefore, this study aims to identify the critical management practices influencing occurrence of workplace injuries in apparel industry in Sri Lanka.*

*The quantitative research approach was applied in this research. Questionnaire survey was conducted to collect the data. Nineteen management practices identified through literature are evaluated under six major categories, such as, management commitment, employee participation, training programmes, communication and feedback, hiring practices and rewards system. The questionnaire survey data were analysed using statistical software and Mean Weighted Rating was used to determine significant management practices. As per the statistical test results, nineteen significant management practices influencing occurrence of workplace injuries in apparel industry in Sri Lanka are determined. As the main implication, this research provides a basis for modelling the relationship between different management practices and the occurrence of workplace injuries and, for implementing best management practices in apparel industry in Sri Lanka.*

**Keywords:** *Apparel Industry; Critical Management Practices; Workplace Injuries; Safety Culture; Sri Lanka.*

## 1. INTRODUCTION

Safety culture is an important concept to understanding the state of the safety within organisations (Vredenburg, 2002). It is specially mentioned about beliefs, values, behaviour, attitudes on the occupational health and safety of the company (Hajmohammad and Vachon, 2014; Clarke, 1999). Consist of managers, supervisors, workforce, company safety policy, rules and procedures created the concept of safety culture (Ali, Abdullah and Subramaniam, 2009). Effective safety of the organisation only can be achieved through the proper management of interrelation between people and technological systems (Kim and Cho, 2016). Management practices consist of different categories such as; training programmes, management commitment, reward system, communication and feedback, hiring practices, and employee participation (Ali *et al.*, 2009). Thus, management can develop a strong safety culture by inspiring certain management practices to reduce the workplace injuries (Reimana and Rollenhagen, 2014). Moreover, worker's belief and management has been linked to safety values and predicting worker work risk behavior and create secure workplace which is

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free from accidents, illnesses, diseases and near misses (Hajmohammad and Vachon, 2014). Work related injuries often create serious problems within the workplace (Yu, Chang and Salvendy, 2004).

According to the statistics of the International Labour Organisation (ILO), around 4,000 workplace accidents are recorded every year in Sri Lanka and Labour Department statistics demonstrated, over 80 Sri Lankans lose their lives from work-related accidents in every year (Warakapitiya, 2016). According to the statistics of the Ministry of Health, around 15% injured patients of total admissions at the Colombo National Hospital was work related injuries and revealed only 1% of from whole estimated accidents (Dissanyake and Fonseka, 2014). Ministry of Labour Relations and Manpower statistics shows, around 17.6% employees work in the manufacturing sector in Sri Lanka (excluding Northern and Eastern provinces) and accidents in manufacturing workplaces are considerable, especially in the apparel industry (Mudugamuwa, 2012). However, lack of regular safety procedures, unsystematic working condition and resource allocation of apparel industry could cause to the workplace injuries in many situations (Reason, 1995).

Therefore, this research is aimed to determine the significant management practices influencing the occurrence of workplace injuries in the apparel industry in Sri Lanka. In addition, this is only a part of a research study in modelling the relationship between different management practices and occurrence of workplace injuries in apparel industry in Sri Lanka.

## **2. LITERATURE REVIEW**

### **2.1. MANAGEMENT PRACTICES IN SAFETY CULTURE**

Culture is a compound phenomenon to study, and also safety culture is the most substantial context of the organisations (Richter and Koch, 2004). Main Purpose of safety culture is to reduce the accident occurrence and accident investigation. And also, it is increasing acceptance of company safety (Strauch, 2015). There are number of definitions developed by various researches to describe the safety culture (Lee and Harrison, 2000). According to those literature findings, safety culture can be identified in the research as a “combination of beliefs, values and behavioral norms regarding safety and health of human factor (managers, supervisors and workforce) and it is manifest the company safety policy, rules and procedures. Hence, safety culture not only considers about company safety, but also individual and group safety”. Safety management concerns to the safety practises as well as responsibility of safety management system (Ek, Runefors and Borell, 2014). Top management is the main driver of management practices and management is monitored to allocate necessary resources to erecting best practices of management practices (Zhu, Zedtwitz, Assimakopoulos and Fernandes, 2016). And also, management involved to implement the management practices with using rational decisions and open minded decisions about their subordinate (Scott, 1981). The term 'management practices' has several definitions and it can see in every situation and therefore management practices have significant characteristic than other factors. Accordingly, management practices are defined in this research as “an address to the specific improvements of safety behaviour and organisational safety performance to an acceptable level of quality, within budget and on time”.

The increased interest of health and safety management system is directly effecting to the decline in occupational injuries and diseases (Yule, Flin and Murdy, 2007). Therefore, the members of top management have responsibility to ensure organisational management system is concurrent with their regulations (Pilbeam, Doherty, Davidson and Denyer, 2016). Accordance with Cooper's safety culture model, Ek, *et al.* (2014) identified, that there is a bi-directional link between safety culture and safety management. Moreover, safety management practices cause to implement relevant rules and regulations, safety policy at the workplace and regulate existing norms (Nordlof, Wiitavaara, Winblad, Wijk and Weaterling, 2015). Work related accidents could lead to the commencement of the awareness of management practices; because, the international Atomic Energy Agency introduce that term from accident summary report of nuclear plant accident in 1986 (Agumba and Haupt, 2014). Poor safety culture reflects by number of accident occurred within organisation (Nordlof *et al.*, 2015). However, the higher level of safety culture could have a positive impact on the decrease of the number of accidents (MdDeros, Ismail, Ghani and MohdYusof, 2014). Ali *et al.* (2009) found that, there is a significant linear relationship between management practices and workplace injuries in industrial zone in Malaysia [ $F(6, 61) = 2.28, p = 0.04$ ].

## 2.2. DIFFERENT MANAGEMENT PRACTICES INFLUENCING WORKPLACE INJURIES

Fernandez-Muniz, Montes-Peon and Vazquez-Ordas (2007) stated that, set of management practices used to analyse the effect and relationship with workplace injuries. Level of management commitment and employee engagement can increase through the proper safety management practices. By dissimilarity of different management practices assent the most suitable ways to manage the safety culture of the organisation (Kelloway, Mullen and Francis, 2006). There are different types of management practices categories shown in literature. Among those, most significant management practices which have highly reviewed in previous literature were selected, such as, management commitment, employee participation, training programs, communication and feedback, reward system and hiring practices. Each category consists of several sub factors. Accordingly, twenty eight (28) factors are identified by reviewing key literature (Arboleda, Morrow, Crum, and Shelly, 2003; Barling, 2005; Harter, Schmidt and Killham, 2006; Rich, Lepine and Crewford, 2010; Lui, Liu and Ling, 2011; Wachter and Yorio, 2013; Biggs, Banks, Davey and Freeman, 2013; Subramaniam *et al.*, 2016; Taufek, Zulkifli, and Kadir, 2016).

Table 1 presents the sub factors of management practices influencing the occurrence of workplace injuries.

Table 1: Sub Factors of Management Practices

Management Practices	Sub Factors
Management Commitment	Management participation for Hands practices Management commitment for safety awareness Create future planning for safety
Employee Participation	Involve to creating safe work instruction Can influence on STOP work criteria Devising solutions to incidence that resulted from human error Performing safety observations of other employees Conducting accident investigation Hiring for safety of their peers
Training programmes	Formally training on the safety aspects Number of hours of formal safety training Frequency of safety training Training elements of hazard recognition and avoidance
Communication and feedback	Information of new or revised safety rules Information on potential hazards in the workplace related Information about the importance of working safely Information about safety incidents experience in the similar organisations Information on near misers by other employee Sharing the results of the safety investigations among workforce
Hiring Practices	Safety values and beliefs of the organisation Only the best people are hired to work in the organisation Job applicants for job offer Physical stating examines for job applicants
Rewards System	Giving out monetary rewards for fewer accidents Giving out non-monetary rewards for fewer accidents Giving out incentives based on individual's safety performance. Giving out incentives based on group's safety performance. Adopting punishment when a worker is found to have violated safety measures on site

By reviewing key literature, 28 sub factors are identified relating to six major categories which are used in subsequent analysis. The methodology adopted is described in Section 3.

### 3. RESEARCH METHODOLOGY

To accomplish the research aim, quantitative research approach was followed which was identified as the most appropriate method for gathering and analysing the data. The data were collected through questionnaire survey. Managerial and executive level professionals in apparel industry, such as, safety officers, environment, health and safety managers, etc were randomly selected for data collection and, seventy-five (75) questionnaires were distributed. Sixty-two (62) numbers of professionals were responded to the questionnaire survey by maintaining a high response rate of 83%.

Figure 1 illustrates the experience of the managerial and executive level people in occupational safety and health sector in apparel industry. There, 16% of workers have experience less than 5 years, 25% have experience in the field for 5-10 years. 12% of them hold 10-15 years of experience and 9% of the respondents have experience more than 15 years in the field as shown in Figure 1.

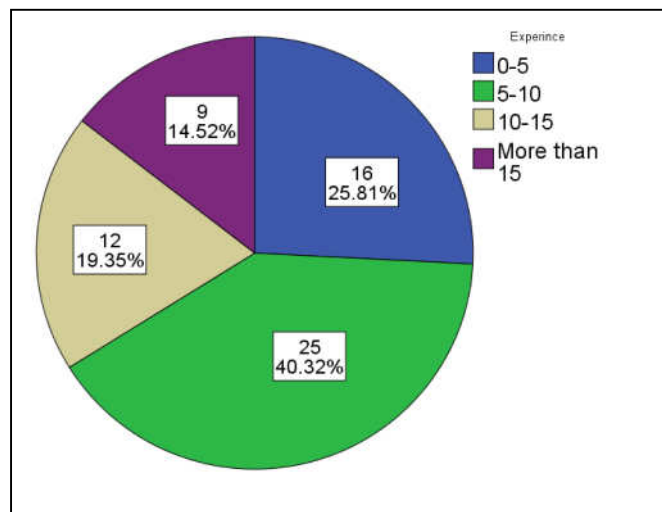


Figure 1: Work Experience of Respondents

The respondents were asked to rank the influence of management practices on the occurrence of workplace injuries using a 5 point Likert scale. The software program SPSS-23 was used for to calculate the Mean Weighted Rating for determining the significant management practices. According to the Sobh and Perry (2006), mean weighted rate (refer Eq. 01) is the sum of weightings which are divided by the total number of respondents.

$$MR = \sum_{i=1}^5 (Fi \times \%R) \quad (Eq. 01)$$

Where: MR = Mean Rating for an attribute; Fi = Frequency of responses for an attribute (ranging from 1-5); %R = Percentage response to rating point of an attribute.

According to the Saunders, Lewis, Thornhill (2009), the inter-quartile range (IQR) of mean value is normally chosen where there are extreme data values that need to be ignored. The significant factors under each category was analysed based on mean rate value.

$$IQR = Q3 - Q1 \quad (Eq. 02)$$

Further, most of the researches stated that there is no considerable value if it is less than mean rating value of 3.00. Result of this analysis is tabulated for each category and results are interpreted based on calculations.

### 4. RESEARCH FINDINGS AND DISCUSSION

The significant factors are assessed under six sub categories of management practices of safety culture. Mean weighted rating technique was used with the support of SPSS to select the significant management practices in each category.

#### 4.1. TRAINING AND SUPERVISION

According to the literature findings training and supervision category consist with four sub factors such as formal training on the safety aspect, number of hours of formal training, frequency of safety training and training elements of hazard recognition and avoidance. The test results of mean weighed rating are mentioned in Table 2.

Table 2: Test Results of Training and Supervision

No	Sub Factors	No	Min. Mean	Max. Mean	Mean	Std. Dev.
1	Formal training on the safety aspect	62	2	5	4.35	0.889
2	Training elements of Hazard recognition and avoidance	62	1	5	4.00	0.992
3	Frequency of safety training	62	1	5	3.76	0.900
4	Number of hours of formal safety training	62	1	5	2.89	1.392

Results of the survey clearly denoted that formal training on the safety aspect has the highest mean weighted rating value of 4.35 (SD = 0.889). Further, 56.45% of the respondents ranked this factor as 'Highly Significant'. Mean weighted rating value of training elements of hazard recognition and avoidance is 4.00 (SD = 0.992) and 30.64% of the respondent selected this factor as 'Highly Significant'. Frequency of safety training calculated mean weighted rating value is 3.76 (SD = 0.900) and around 19.35% respondents rank it as 'Highly Significant'. Number of hours of formal safety training mean weighted rating value calculated as 2.89 (SD = 1.392) and it was rejected due to the lower IQR value of mean weighted rating value (IQR < 3.00). According to survey results, respondents were not considered about number of hours of formal safety training as a significant factor among the other factors. High training frequency could cause to update knowledge on safety information, but long training hours may not do it effectively.

As per the results, three factors were selected as significant management practices such as; formal training on the safety aspect, frequency of the safety training and training elements of hazard recognition and avoidance.

#### 4.2. EMPLOYEE PARTICIPATION

This category consists with six sub factors such as; involve to create safe work instruction, can influence on STOP work criteria, devising solutions to incidence that resulted from human error, performing safety observations of other employees, conducting accident investigation and hiring for safety of their peers.

The result of discussed status including weighted mean and standard deviation of employee participation related factors are shown in Table 3.

Table 3: Test Results of Employee Participation

No	Sub Factors	No	Min Mean	Max Mean	Mean	Std. Dev.
1	Involvement to create safety work instruction	62	2	5	4.19	0.827
2	Conducting accident investigation	62	2	5	4.13	0.896
3	Devising solutions to incidence that resulted in human error	62	1	5	2.97	1.267
4	STOP work criteria	62	1	5	2.95	1.26
5	Performing safety observation of other employee	62	1	5	2.94	1.458
6	Hiring safety of their peers	62	1	5	2.82	1.153

Among the other factors, involve to create safety work instruction is the most significant factor witch to be mean weighted rating value of 4.19 and standard deviation of 0.827. Further, 40.32% of respondents are ranked this factor as 'Highly Significant'. Conducting accident investigation showed MWR value of 3.13 and standard deviation of 0.896 as the second significant factor. According to the lower IQR of mean weighted rating value

(IQR < 3.00), four factors were rejected, such as; devising solutions to incidence that resulted from human error, STOP work criteria, performing safety observations of other employee and hiring safety of their peers. Thus, two factors were selected as significant management practices such as; involvement to create safety work instruction and conducting accident investigation.

### 4.3. COMMUNICATION AND FEEDBACK

Information of new or revised safety rules, information on potential hazards in the workplace related, information about the importance of working safely, information about safety incidents experience in the similar organisations, information on near misses by other employee and sharing the results of the safety investigations among workforce are the sub factors identified in this category.

Table 4: Test Results of Communication and Feedback

No	Sub Factors	No	Min.	Mean	Max.	Mean	Std. Dev.
1	Information about the important of working safety	62	1		5	4.26	0.867
2	Information of new or revised safety rules	62	2		5	4.15	0.921
3	Information on potential hazard in the workplace	62	2		5	4.08	0.911
4	Sharing the results of safety investigation among workforce	62	2		5	4.06	0.939
5	Information of near misers by another employee	62	1		5	3.9	1.051
6	Information about safety incidents experience in the similar companies	60	1		5	3.77	0.998

According to the test results shown in Table 4, all the factors were identified as significant factors. Information about the importance of working safety is the most significant factor which showed mean weighted rating value of 4.26 and standard deviation of 0.867. Further, 45.16% of respondents are ranked this factor as 'Highly Significant'. Information of new or revised safety rules showed mean weighted rating value of 4.15 and standard deviation of 0.921 as the second significant factor. Information on potential hazards in the workplace was third significant factor with the 4.08 of mean weighted rating value and 0.911 of standard deviation. Further, 38.70% of responders ranked this factor as 'Highly Significant'. Further, sharing the results of safety investigation among workforce, information of near misers by another employee and information about safety incidents experience in the similar companies also selected as significant factors with the mean weighted rating values of 4.06, 3.9 and 3.77 respectively.

### 4.4. REWARD SYSTEM

This category consists of five sub factors such as; giving out monetary rewards for fewer accidents, giving out non-monetary rewards for fewer accidents, giving out incentives based on individual's safety performance, giving out incentives based on group's safety performance and adopting punishment when a worker is found to have violated safety measures on site. Mean Weighted Rating of each facto is evaluated as shown in Table 5.

As the Table 5 illustrates, two factors were determined as significant factors such as, non-monetary rewards for fewer accidents and giving out incentives based on group's safety performance. Among those, non-monetary rewards for fewer accidents is the most significant factor which showed mean rating value of 3.48. Further, 11.29% of respondents ranked this factor as 'Highly Significant'.

Table 5: Test Results of Reward System

No	Sub Factors	No	Min. Mean	Max. Mean	Mean	Std. Dev.
1	Non-monetary rewards for fewer accidents	62	1	5	3.48	0.901
2	Giving out incentives based on group safety performance	62	1	5	3.48	1.067
3	Giving monetary rewards for fewer accidents	62	1	5	2.98	1.079
4	Adopting punishments when the worker violated safety measures	62	1	5	2.98	1.287
5	Individual Performance	62	1	5	2.95	1.137

Further, giving out incentives based on group's safety performance also showed highest ranking with the respective Mean Weighted Values of 3.48 with the 14.51% response rate as 'Highly Significant'.

#### 4.5. MANAGEMENT COMMITMENT

According to the literature reviewed, management commitment consists of three sub factors such as; management participation for health and safety (HandS) practices, management commitment for safety awareness and create future planning for safety.

Table 6: Test Results of Management Commitment

No	Sub Factors	No	Min. Mean	Max. Mean	Mean	Std. Dev.
1	Management participation for HandS practices	62	2	5	4.44	0.842
2	Management commitment for safety awareness	62	2	5	4.42	0.841
3	Creating future planning for safety	62	2	5	4.35	0.832

The result shown in Table 6 proved that all three factors are statistically significant based on Mean Weighted Values calculated. Among those, management participation for HandS practices is the most significant factor which has mean rating value of 4.44 and standard deviation of 0.842. Further 59.67% of respondent are ranked this factor as 'Highly Significant'. Management commitment for safety awareness showed mean rating value of 4.42 and standard deviation of 0.841 and selected as the second significant factor with 59.67% of respondent ranking. Create future planning for safety is the selected as third significant factor which has mean rating value of 4.35 with standard deviation of 0.832. 54.83% of respondents ranked this factor as 'Highly Significant'.

#### 4.6. HIRING PRACTICES

This consists of four sub factors such as; safety values and beliefs of the organisation, only the best people are hired to work in the organisation, job applicants for job offer and physical stating examines for job applicants.

Table 7: Test Results of Hiring Practices

No	Sub Factors	No	Min. Mean	Max. Mean	Mean	Std. Dev.
1	Safety values and beliefs of the organisation	62	1	5	3.9	0.863
2	Only the best people are hired to work in the company	62	1	21	3.37	2.543
3	Physical stating examines for job applicant	62	1	5	3.27	1.23
4	Job applicant of the job offer	62	1	5	2.97	1.13

The Table 7 illustrate the test result of hiring practices. Among the other factors, safety values and beliefs of the organisation has highest mean weighted rating value of 3.9 and standard deviation of 0.863. Further, 24.19% are ranked the factor as 'Highly Significant'. Only the best people are hired to work in the organisation

is the second significant factor which has 3.37 of mean weighted rating value and 2.543 of standard deviation and 11.29% of respondents ranked the factor a 'Highly Significant'. Physical stating examines for job applicants is the third significant factor which has mean rating value of 3.27 and standard deviation of 1.23. Further, 19.35% of respondents ranked the factor as 'Highly Significant'.

#### 4.7. REJECTED FACTORS

Nine factors are rejected as 'statistically insignificant' based on IQR of mean rating value such as, number of hours of formal safety training, devising solutions to incidence that resulted in human error, stop work criteria, performing safety observation of other employees, hiring safety of their peers, giving monetary rewards for fewer accidents, adopting punishments when the worker violated safety, individual performance and job applicant of the job offer as shown in Table 8.

Table 8: Rejected Factors

No	Sub Factors	No	Min. Mean	Max. Mean	Mean	Std. Dev.
1	Number of hours of formal safety training	62	1	5	2.89	1.392
2	Devising solutions to incidence that resulted in human error	62	1	5	2.97	1.267
3	STOP work criteria	62	1	5	2.95	1.26
4	Performing safety observation of other employees	62	1	5	2.94	1.458
5	Hiring safety of their peers	62	1	5	2.82	1.153
6	Giving monetary rewards for fewer accidents	62	1	5	2.98	1.079
7	Adopting punishments when the worker violated safety	62	1	5	2.98	1.287
8	Individual Performance	62	1	5	2.95	1.137
9	Job applicant of the job offer	62	1	5	2.97	1.13

#### 4.8. SIGNIFICANT MANAGEMENT PRACTICES SELECTED FOR NEXT STAGE OF THE RESEARCH

Based on statistical analysis, nineteen (19) factors are determined as 'statistically significant factors' relating to the six major categories. As statistical analysis showed, formal training on the safety aspect, training elements of hazard recognition and avoidance and frequency of safety training are the statistically significant factors in training and supervision. Communication and feedback related significant practices include information about the important of working safety, information of new or revised safety rules, information on potential hazard in the workplace, sharing the results of safety investigation among workforce, information of near misers by another employee and information about safety incidents experience in the similar companies. Further, management participation for HandS practices, management commitment for safety awareness and creating future planning for safety are other significant factors related to management commitment. Employee participation includes two significant factors such as involvement to create safety work instruction and conducting accident investigation.

Further, non-monetary rewards for fewer accidents, giving out incentives based on group safety performance, safety values and beliefs of the organisation, only the best are people hired to work in the company and physical stating examines for job applicant are the other significant factors related to reward system and hiring practices respectively.

The selected factors are shown in Figure 2.

The nineteen (19) statistically significant management practices which were determined at the first stage of data analysis were selected for the next stage of the research for modelling the relationship between different management practices and occurrence of workplace injuries in apparel industry in Sri Lanka.



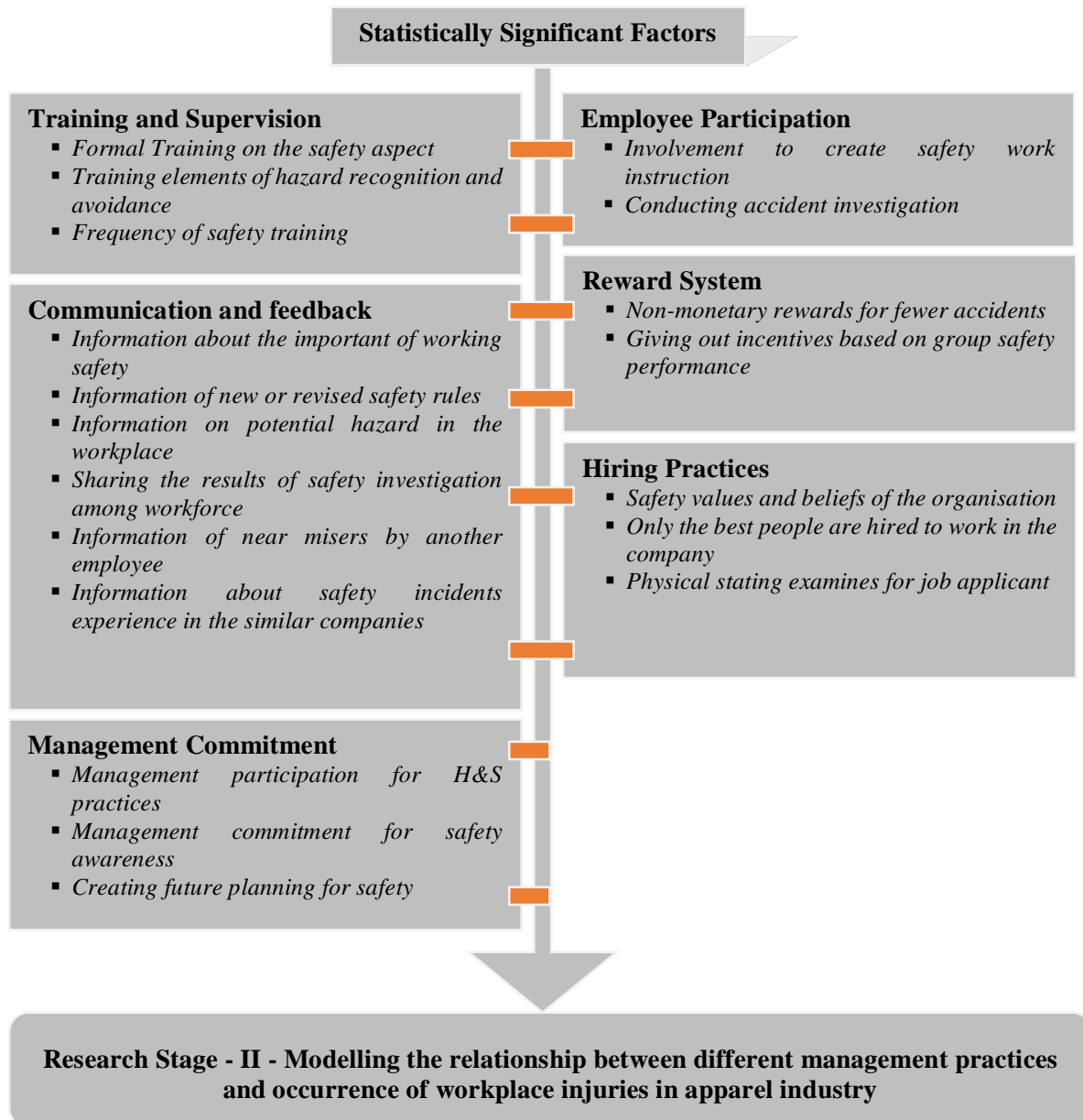


Figure 2: Significant Management Practices Selected for Research Stage - II

## 5. SUMMARY

This research aimed to determine the statistically significant management practices influencing occurrence of workplace injuries in apparel industry in Sri Lanka. The research discloses the critical factors by using Mean Weighted Rating analysis. Accordingly, nineteen factors were identified as statistically significant factors whilst nine factors were rejected as statistically insignificant. As this paper presents the initial findings of the research, the identified factors will be used for statistical modelling of the relationship between different management practices and occurrence of workplace injuries in apparel industry in Sri Lanka as the next stage of data analysis. However, at this stage, the findings can be used as a basis to implement an effective management practices in apparel industry for assuring safety environment with fewer occurrence of workplace injuries.

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