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# Analysis of Factors Affecting the Success of Safety Management Programs of Food Manufacturing Companies in Nairobi County, Kenya

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**ABSTRACT :**This study sought to analyze the factors affecting the success of safety management programs of food manufacturing companies in Nairobi County, Kenya. Specifically the study analyzes the effect of, Personal Protective Equipment, communication, Safety Training and Management Commitment on the success of safety management programs of national food manufacturing companies in Kenya. To achieve its objectives the study adopted a descriptive design with quantitative approach where semi-structured questionnaires were administered. The target population included 2510 employees of 12 registered food-manufacturing companies in Nairobi County as per the Information Centre, Directorate of Occupational Safety and Health office Safety House Ministry of Labor (2016). A sample size of 365 employees was obtained using the Fisher's formulae a response rate of 91.5%. Statistical Package for Social Sciences was used to generate descriptive and inferential data. A regression model was developed to establish the strength and direction of the relationship between the dependent and the independent variables. The regression was significant and had R squared of 0.283 with the following coefficients; Personal Protective Equipment 0.063, communication 0.386, Safety Training 0.236 and Management Commitment 0.231. R squared value of 0.283 shows that the variables under this study only contribute 28.3% towards the success of safety management programs. Thus the study recommends that other studies be carried out to determine other factors affecting the success of safety management programs in the food manufacturing industry. Of the variables under study communication was found to have the highest effect and thus the study recommends that managers should ensure effective communication about safety training programs.

***KEY WORDS**: Personal Protective Equipment, communication, Safety Training, Management Commitment, Safety Management Programs*

## I. INTRODUCTION

According to World Health Organization (WHO, 2002), industrial safety and health is the promotion and maintenance of physical, mental and social wellbeing of all workers in all occupations. International Labour Organization (ILO, 2001) supports WHO's definition further by asserting that safety and health is the protection against employment risk and placing workers in a good environment. The International System Organization (ISO) standard that deals with Occupational Health and Safety Management Certification, OSHAS 18001:2007 Clause 4.2, stipulate the that top management shall define and authorize the organization's occupational health and safety policy (safety programs) and ensure that it is within the defined scope. Clause 4.5.1 of the same OHSAS 18001:2007 on performance measurement and monitoring requires the organization to establish, implement and maintain a procedure(s) to monitor and measure occupational health and safety performance on a regular basis. The main aim of these programs is as defined by Institute of Technology and Society, Department of Safety Research (Peón & Muñiz, 2012), is to protect the employees against employment risks and place the worker in a safety working environment.

According to Occupational Safety and Health Act (2007) of the Laws of Kenya, it is mandatory for every employer to implement safety management programs. Records from the department of occupational safety and health services, Ministry of Labour Nairobi County, accident and incident continue to happen despite the safety management programs launched and implemented by the national companies operating in Kenya. Despite the safety programs implemented by management and audited by the Kenyan government, national companies continue to report accidents and incidents every year.

Some national companies have reported fatalities while others have reported accidents that have led to permanent disabilities. It was therefore important to conduct a study to ascertain why accidents continue to happen despite the mandatory implementation of safety management programs. Thus this study sort to analysis of factors affecting the success of safety management programs of national food manufacturing companies in Kenya.

The study was based on the following specific objectives:

1. To analyze the effect of Personal Protective Equipment on the success of safety management programs of national food manufacturing companies in Kenya.
2. To assess the effect of communication on the success of safety management programs of national food manufacturing companies in Kenya.
3. To evaluate the effect of Safety Training on the success of safety management programs of national food manufacturing companies in Kenya.
4. To explore the effect of Management Commitment on the success of safety management programs of national food manufacturing companies in Kenya.

**Justification of the Study**

The outcome of this research will assist organization top executives apply the right strategies for successful implementation of safety management programmes. Successful implementation will lead to better working environment, positive image, improved staff morale and increased productivity.

## II. LITERATURE REVIEW

According to Unnikrishnan et al, (2014), small and medium enterprises (SMEs) are the main pillars of India's economy. Minor accidents, ergonomics problems, old and outdated machinery, and lack of awareness have created a need for implementation of safety practices in these SMEs. In this study, a questionnaire was developed and administered to 30 randomly chosen SMEs in and around Mumbai and Maharashtra so as to evaluate safety practices implemented in their facilities. The findings showed that safety management practices were inadequate in most SMEs. The major contribution of the study has been awareness building on safety issues in the SMEs that participated in the project. Workers are the ultimate "shareholders" in work site safety and health. Employee involvement can take a variety of forms: participation in the development of safety programs and in workplace inspections, membership on joint labor/management committees, and active participation in accident and "near-miss" investigations (Manuele, 2003).

Joint labor-management safety committees provide a frequently used and widely recommended vehicle for encouraging employee involvement in the safety and health program. Burgess (1995) argues that joint labor-management safety committees provide a means for employees to actively participate in safety and health decision-making, receive additional training in hazard identification and control methods, and share their knowledge of hazards and related problems with management. Informed workers also provide an excellent way of leveraging scarce occupational safety and health resources effectively.

A study carried out by Vredenburgh (2002) on which management practices are most effective in reducing employee injury rates, examined the degree to which six management practices frequently included in safety programs (management commitment, rewards, communication and feedback, selection, training, and participation) contribute to a safe work environment for hospital employees. Participants were solicited via telephone to participate in a research study concerning hospital risk management. Sixty-two hospitals provided data concerning management practices and employee injuries. Overall, the management practices reliably predicted injury rates. A factor analysis performed on the management practices scale resulted in the development of six factor scales. A multiple regression performed on these factor scales found that proactive practices reliably predicted injury rates. Remedial measures acted as a suppressor variable. The most effective step that hospitals can take is in the front-end hiring and training of new personnel. The study recommended that hospital management should ensure that risk management position has a management-level classification.

To demonstrate organizational commitment, top management must actively participate and be "visible" during program implementation. Copies of the written safety and health manuals should be distributed to all employees. The written program should outline procedures for formally evaluating or auditing the occupational safety and health program's success at least once a year. At a minimum, this plan should include information on safety responsibilities, emergency procedures, and provisions for hazard communication, accident prevention, inspections, grounded electrical systems, record keeping, personal protective equipment, and housekeeping (Boden et al., 1984).

Based on the literature review, the following conceptual framework showing the relationship between the research variables was developed.

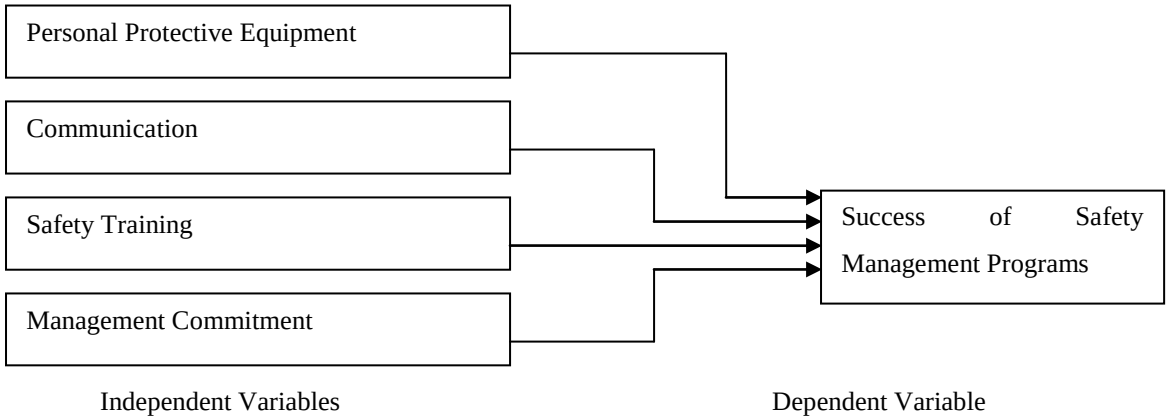


Figure 1: Conceptual Framework

## III. METHODOLOGY

This study adopted a mixed research design approach (quantitative and qualitative research design). The study targeted 2510 employees of 12 registered food manufacturing companies in Nairobi County as per the Information Centre, Directorate of Occupational Safety and Health office Safety House Ministry of Labour (2016). A sample size of 365 employees was obtained using the Fisher's formulae (Fisher et al, 1998). The data collection tool was a semi-structured questionnaire and yielded a response rate of 91.5%.

Data was subjected to analysis using STATA 13 and R statistical software. Descriptive statistics were used to summarize categorical variables. Pearson's correlation coefficient was used to test for the strength of association between categorical variables. The threshold for statistical significance was will be at $\rho = 0.05$ and a two-sided p value at 95% confidence intervals. All independent variables that had a significant association with the dependent variable were considered together in a multivariate analysis.

## IV. RESULTS

**Personal Protective Equipment and Success of Safety Management Programs**

Four parameters were used to measure effect of personal protective equipment on success of Safety Management Programmes. The study showed that working without protective equipment does not enhance successful safety programmes (mean of 2 out of 5), while establishment of a budget for protective equipment successful safety programmes (mean of 4 out of 5).

**Table 1: Mean Scores of Personal Protective Equipment and Success of Safety Management Programs**

| Item | Statement | Mean | Std. Deviation |
|---|---|---|---|
| 1 | Working without right equipment enhances successful safety programmes | 2.009 | 1.165 |
| 2 | Minimal money is needed to enhance successful safety programmes | 3.506 | 1.164 |
| 3 | There is a Personal Protective Equipment budget for safety programmes | 4.042 | 0.819 |
| 4 | Philosophy of safety over cost enhances successful safety programmes | 3.379 | 1.174 |

**Communication and Success of Safety Management Programs**

Effects of communication on the success of Safety Management Programs was measured by 12 items on a Likert scale rating.

**Table 2: Mean Scores of Communication and Success of Safety Management Programs**

| **To what extent do the following enhance success of Safety Management Programmes:** | | | |
|---|---|---|---|
| **No.** | **Item** | **Mean** | **Std. Deviation** |
| 1 | OSH policies | 4.06 | 0.7671 |
| 2 | Safety information visible | 4.37 | 0.757 |
| 3 | Managers are visible ambassadors for safety | 4.075 | 1.024 |
| 4 | Safety notice board with posters | 2.957 | 1.233 |
| 5 | Rarely getting information on safety | 4.087 | 1.127 |
| 6 | Management priority is restoring production | 3.012 | 1.111 |
| 7 | Accidents are investigated openly | 3.942 | 1.080 |
| 8 | Line mangers seek staff inputs | 3.791 | 0.971 |
| 9 | Safety contact | 3.997 | 1.0179 |
| 10 | Fulltime safety professional | 3.913 | 1.007 |
| 11 | Management aware of unsafe behaviour | 3.496 | 1.263 |
| 12 | Managers seek feedback | 4.118 | 0.7508 |

According to the descriptive results, having Occupational Safety and Health (OSH) Policies in place, ensuring that safety information is available and the ability for managers to seek feedback had the highest effect on the success of Safety Management Programs. The means score of OSH was 4/5, availability of safety information was 4/5 and ability for managers to seek feedback was also 4/5.

**Safety Training and Success of Safety Management Programs**

Safety training effects was assessed on a 13 items on a Likert scale rating as depicted in Table 3.

**Table 3: Mean Scores of Safety Training and Success of Safety Management Programs**

| To what extent do the following affect of Safety Management Programmes: | | | |
|---|---|---|---|
| **No.** | **Item** | **Mean** | **Std. Deviation** |
| 1 | Procedures for reporting accidents available | 4.376 | 0.6907 |
| 2 | Safety awareness visible and discussed | 4.352 | 0.717 |
| 3 | Production and safety importance | 3.45 | 1.291 |
| 4 | Safety and production are seen equal | 3.512 | 1.139 |
| 5 | Management blame employee | 3.266 | 1.225 |
| 6 | Accidents are reported and investigated | 4.369 | 0.767 |
| 7 | Feedback given on accidents | 4.077 | 0.895 |
| 8 | Safety committee | 3.646 | 1.074 |
| 9 | Line managers are approachable | 4.212 | 0.758 |
| 10 | Everyone involved in management of safety | 4.058 | 0.951 |
| 11 | Challenge colleagues react negatively | 3.0457 | 1.214 |
| 12 | Colleagues stop me when its unsafe | 3.867 | 0.969 |
| 13 | Structured safety observations conducted | 4.110 | 0.826 |

Of the 13 data items on the effects of Safety training on the success of Safety Management Programs: Availability of accident reporting procedures, Safety awareness visibility, Reporting and investigation of accidents, Feedback given on accidents, Approachable line managers, Management of safety involvement and Conducting of structured safety observations had the highest effect, all with mean scores of 4/5.

**Management Commitment and Success of Safety Management Programs**

Majority of the respondents were of the opinion that the organization has adequate OSH polices (mean score of 4.4 out of 5) and management understood safety and health issues in employees work area (mean score of 4.2 out of 5). However, majority of the employees were not of the opinion that; Safety in the workplace is an expensive discipline that yields low returns (mean score of 1.8 out of 5), only major incidents are investigated (mean score of 1.9 out of 5), and that safety is only a priority after serious accident or prior to an audit (mean score of 1.9 out of 5).

**Table 1: Mean Scores of Management Commitment and Success of Safety Management Programs**

| Items | Statement | Mean | Std. Deviation |
|---|---|---|---|
| 1 | Company has adequate OSH policies | 4.404 | 0.605 |
| 2 | Safety is only a priority after serious accident or prior to an audit | 1.947 | 1.175 |
| 3 | We investigate only major incidents | 1.941 | 1.129 |
| 4 | Line managers known to flaunt the safety rules | 2.335 | 1.303 |
| 5 | Senior managers discuss safety with us but discussion is related to production reality priority is production | 2.803 | 1.298 |
| 6 | Discussions around safety are always as a result of an incident or something | 2.253 | 1.159 |
| 7 | Management understands safety and health issues in my work area | 4.226 | 0.819 |
| 8 | Safety stated as priority but some decisions go against this | 2.984 | 1.269 |
| 9 | Management claim they want safety concerns reported but they ignore | 2.333 | 1.194 |
| 10 | Safety concerns discussed with line managers but implementation is slow | 3.103 | 1.103 |
| 11 | I can stop production for a safety concern and get support from line manager | 3.545 | 1.218 |
| 12 | Safety an expensive discipline that yields low returns | 1.792 | 0.9251 |

**Regression Modeling**

The regression model indicated that there is a positive correlation (r=0.532) between the independent and dependent variables. With a $R^2 = 0.283$, the combined independent variables account for 28.3% of the changes in the dependent variable (Success of Safety Management Programs). Even though the model was

significant (p value= 000), the data analysis indicates that 71.7% of changes in the dependent variable can be attributed to other factors not considered in the research study.

**Table 5: Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .532[a] | .283 | .270 | .428 |

a. Predictors: (Constant), management, ppe, training, communication

**Table 6: ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 15.832 | 4 | 3.958 | 21.618 | .000[b] |
| | Residual | 40.096 | 219 | .183 | | |
| | Total | 55.929 | 223 | | | |

a. Dependent Variable: safety

b. Predictors: (Constant), management, ppe, training, communication

**Table 7: Model Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .134 | .165 | | .814 | .416 |
| | ppe | .063 | .058 | .063 | 1.090 | .277 |
| | communication | .386 | .059 | .386 | 6.546 | .000 |
| | Safety training | .236 | .058 | .234 | 4.062 | .000 |
| | management | .231 | .059 | .230 | 3.905 | .000 |

a. Dependent Variable: safety

The regression model in Table 7 is as follows:

$$Y = 0.134 + 0.063X_1 + 0.386X_2 + 0.236X_3 + 0.231X_4$$

This implies that when all other independent variables included in the research are zero, success of safety management programmes will be 0.134. The study showed that Communication has the highest impact on the success of safety management programmes, with a co-efficient of 0.386. This means that a unit change in communication, all other factors held constant, will contribute to a 0.386 unit change in success of safety management programmes.

## V. CONCLUSIONS AND RECOMMENDATIONS

**Conclusion**

The study showed that Personal Protective Equipment, Communication, Safety Training and Management Commitment had a positive effect on success of safety management programmes. However, since the variables under study contributed to 28.3% of the changes in the dependent variable, there are other variables (71.7%) that the study did not account for.

According to the study, communication had the greatest effect (co-efficient of 0.386) while Personal Protective Equipment (co-efficient of 0.063) on the success of safety management programmes.

**Recommendation**

More studies needs to be done to identify other factors that contribute to the success of safety management programmes. Additionally, mangers should continuously communicate issues regarding OHS and safety programmes in order to strengthen the success of safety management programmes in the organization.

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