An Assessment of the Occupational Health and Safety Environment among Organizations on the Light of OHSAS 18001: The Case of Saudi Arabia

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Abstract

This study aims at assessing the occupational health and safety workplace in a wide range of organizations in Saudi Arabia. The study investigates four factors according to OHSAS 18001: 2007 requirements analyzing data from 348 organizations. Those factors are; hazard identification, top management support, communication and participation of occupational health and safety system and emergency preparedness and response. This research reveals that the practice of occupational health and safety in the country is not promising in general with a poor accomplishment of the first factor (hazard identification) and an average level of the other three factors. When comparing between types of firms in their accomplishment, they are ranked as follows; manufacturing firms, hospitals and clinics, service firms, educational institutions and government agencies, respectively. The study also shows that organizations hold OHSAS 18001 certificates perform better than those that do not have the standard and shows that organizations with occupational health and safety departments perform better than those with no departments.

Keywords: OHSAS 18001, Occupational Health and Safety, Assessment, Workplace, Environment, Standard, Saudi Arabia.

1. Introduction

Occupational Health and Safety Assessment Series (OHSAS) have been developed by British Standards Institution (BSI) with the collaboration of several world professional organizations. In 1999, BSI issued the first version of OHSAS 18001:1999; Occupational Health and Safety Management Systems. By 2007, the latest version of the standard has been issued with a great contribution from several professional world firms. OHSAS 18001: 2007 aims at establishing a safe and healthy workplace in all types of organizations. In 2005, around 16 thousand organizations have been certified for the standard in more than 80 countries and in 2009 the number jumped to more than 54 thousand firms in 166 countries worldwide. OHSAS 18001 is aligned with both ISO 9001; quality management systems and ISO 14001; environmental management systems. This alignment allows one documentation in case the company implements OHSAS 18001 along with one or both of those standards.

In Saudi Arabia, it is not clear how many companies that may certify to the standard. However, there is assumption that many manufacturing firms in the country have implemented even tougher occupational health and safety measurements. Aramco, Sabic and other highly developed companies are probably among those firms implementing good standing measurements. Nevertheless, too many other manufacturing or service organizations may have a hazardous work environment. This may pose a threat to health and safety of employees, customers or the surrounding environment. There is a concern over the health and safety of work environment in a range of Saudi Arabian organizations in many sectors of activities. Therefore, this current study will assess such working environment of the organization in the country attempting to include manufacturing firms, telecommunication, hotel and tourism firms, educational institutions, governmental organizations and hospitals. The assessment of the workplace environment in this study will be on the light of the requirements of OHSAS 18001: 2007 whether such firms are certified to this standard or not. The investigation in this study will serve as a gap analysis to those organizations so that such firms may realize how far they are from a reasonable safe and healthy workplace environment.

The first objective of this study is to investigate the general requirements that are included in OHSAS 18001 in four factors; hazard identification, top management support, communication and participation of occupational health and safety system and emergency preparedness and response. The second objective is to investigate the discovery of any significant differences that might occur between the different types of organizations in performing the requirements of a healthy and safe occupational environment. The third objective of this research is to investigate any differences between organizations that hold OHSAS 18001 versus others and to investigate any differences between organizations that have occupational health and safety departments against others with no departments.

2. *Limitations of the Study*

This study is limited to the requirements stated in OHSAS 18001 that are related to the well-being of the occupational health and safety matters in organizations. Other elements in the standard such as documentation, control of documents, evaluation of compliance, control of records, internal audits and management review are not included in the study since many of organizations are more likely not to be certified for OHSAS 18001.

3. Literature Review

3. 1 General Overview

OHSAS 18001: 2007 is part of Occupational Health and Safety Assessment Series (OHSAS). They are OHSAS 18001: 2007; Occupational Health and Safety Management Systems – Requirements and OHSAS 18002: 2007;Guidelines for the Implementation of OHSAS 18001. The aim of standards is to provide requirements for effective occupational and health management systems that can be integrated into other management systems such as ISO 9001 and ISO 14001. Baker (2001) states that many companies certified to ISO 9001or ISO 14001 then prepare themselves and certify for OHSAS 18001. Laws (2002) mentions that National Semiconductor Corporation achieved both ISO 14001 and OHSAS 18001 certifications simultaneously, gaining a competitive advantage by signaling its adherence to the most important international safety and environmental management standards. Occupational health and safety defines by the standard as being “conditions and factors that affect, or could affect, the health and safety of employees or other workers (including temporary workers and contractor personnel) visitors or any other persons in the workplace”. OHSAS 18001 is intended to be implemented at all types and sizes of organizations and accommodate different social, geographical and cultural conditions. Organizations can seek certification for OHSAS 18001 through external certification agencies while OHSAS 18002 is just a guide that can be used to implement OHSAS 18001. Hence, OHSAS 18002 is similar to ISO 9004: 2009 (2009) which is used as a guide to implement ISO 9001.Although OHSAS 18001 is a British standard, several international organizations working in the field of standardization and certification participate in the development of the standard. Organizations from USA, Spain, France, Czech, Hong Kong, Argentina, Columbia, Costa Rica, Uruguay, Japan, Korea, Ireland, Singapore, Netherlands, Morocco, New Zealand, Israel, Sweden and Zimbabwe. This huge participation in the development of the standard gives it an outstanding legitimacy and fame. OHSAS 18001 implementation, helps to improve organizations image among its stakeholders; customers, regulators, suppliers, employees, the media and the government. It also help to assess potential and real risks, ensure health of employees, suppliers and subcontractors, minimizes employees liabilities and reduces accidents rates through the elimination of hazards.

3.3 OHSAS 18001 Implementation

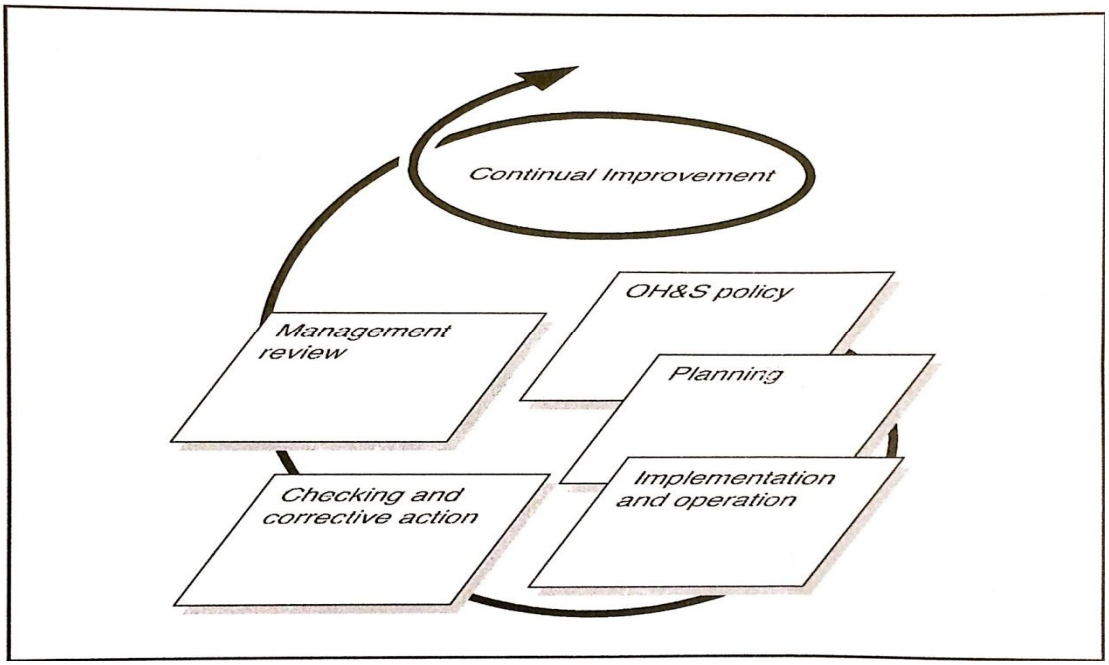
As the case of all other certifiable standards (e.g. ISO 9001, ISO 14001 and ISO 22000), OHSAS 18001 requirements may be externally audited through a certification agency. An organization seeking certification may hire external consultants to develop and document their system according to the requirements of the standard. The organization should perform regular internal audit and select an external certification agency to perform official assessment and provide a certificate if there is a compliance to OHSAS 18001 requirements. Organizations seeking the implementation of this standard may use the other OHSAS standard (OHSAS 18002: 2007; Guidelines for the Implementation of OHSAS 18001). In addition, OHSAS 18001 suggests the use of the approach known as Plan-Do-Check-Act (PDCA Cycle) in order to implement the standard in any organization. PDCA demands establishing the objectives and processes, implement the processes, monitor and measure processes and take action. Pojasek (2012) considers the use of PDCA approach to implement OHSAS 18001 along with the other quality systems as being the most straightforward approach to adopt a management system structure.

For the implementation of OHSAS 18001, firms need to develop their system manual, objectives, programs and policies, hazard identification and risk assessment, legal requirements related to health and safety, adequate resources, communication and participation, emergency procedures, monitoring, auditing, documentation, record control and management review.

Dragomir at al. (2013) contend that ISO 9001, ISO 14001 and OHSAS 18001 standards are, the most relevant standardized tools for organizational management and are also the most widely used in industry as bases for integrated management systems. Qi et al. (2013) in their study in China find that organizations in the country that are publicly listed shows significant explanatory power for certifying with OHSAS 18001. Another study to 211 US manufacturing firms, Lo et al. (2014) find that the certification to OHSAS 18001lead to significant increases in abnormal performance on safety, sales growth, labor productivity, and profitability and that these benefits increase as complexity and coupling increase. Haight and Yorio (2014) recommend that organizations may use all the activities that go into a traditional safety and health program. Such activities include; safety training, behavioral safety observations, safety meetings, safety inspections and audits. They also suggest hazard and risk assessments and safety awareness campaigns.

OHSAS 18001 includes a correspondence table as Annex A between OHSAS 18001, ISO 9001 and ISO 14001, so firms that implement more than one standard do not have to duplicate the similar documentations across the three standards. Rebelo et al. (2014:1; 2014:2) conduct a study of the integration of ISO 9001, ISO 14001 and OHSAS 18001. They find that the integration help in the elimination of conflict, the elimination of wastes, the improvement of partnership of suppliers and the reduction of internal and external audits. Powley and Jones (2002) contend that OHSAS 18001 should be built on the three qualitative principles of risk management; the identification and evaluation of the risks and opportunities and decide which are significant, the management of the identified significant risks and monitoring the effectiveness of the management of the significant risks. Sidewell (2008) explains the experience of Shepherd Engineering Services with OHSAS 18001 where it was initially assessed by The British Standards Institution (BSI) looking at its health and safety policy and arrangements, procedures manual, site safety plan, site safety information binder, and head-office health and safety plan. Figure 1 presents Occupational Health and Safety (OH&S) management system model for OHSAS 18001: 2007.

Figure 1: OH&S Management System Model for OHSAS 18001 Standard



Source: OHSAS 18001: 2007 (2007) Occupational Health and Safety Management Systems – Requirements, British Standards Institution (BSI), London, UK, p. VI.

4. Methodology

The questionnaire is developed based on the general requirements that are included in OHSAS 18001 in four factors; hazard identification, top management support, communication and participation of occupational health and safety system and emergency preparedness and response. Other aspects of the standard that are related to the certification process such as documentation, developing manual and internal audit are not included. The reason for that is because not all organizations under study are certified to the standard. Questionnaires are distributed to graduate male and female students studying in the professional private master programs at the Faculty of Economics and Administration, King Abdulaziz University. Such students are professional employees working in a wide range of organizations; private and public, manufacturing and service as well as healthcare and educational sectors. Respondents are studying at the Executive MBA, Master of Professional Accounting, Master of Health Services and Hospitals and Executive Master of Public Administration. Respondents study during the week-ends twice a month and they come from all regions of the country. Moreover, the Executive MBA has two branches in the provinces of Gassim and Hayel while the Master of Healthcare has a branch in Riyadh; all of which participate in the study. Therefore, we assume that participants in the study represent the whole country of Saudi Arabia. We distributed more than 500 questionnaires and received 412, out of which, 348 are considered usable for analysis. We use Likert scale of five points ranging from always, often, sometimes, rarely and never. The representations of the Means in the results are displayed in Table 1.

Table 1: Five Likert Scale Means Representations

Means Range	Answers	Weighted
1 to 1.80	Never	1
1.80 to 2.60	Rarely	2
2.60to 3.40	Sometimes	3
3.40 to 4.20	Often	4
4.20 to 5	Always	5

We use SPSS Statistical software to analyze data using Descriptive Statistics to find frequencies, percentages, means and standard deviations. Pearson Correlation is used to find the internal consistency among the four factors of this current study. Moreover, One Way Anova has been used to find differences between types of organizations in performing the four factors. Scheffe test is used to rank the organizations in performing the four factors of the occupational health and safety practices. The Independent Samples t-test is used to find out the differences between organizations in two matters; if they hold OHSAS 18001 or not and if they have occupational and health departments or not.

We ensure the validity and reliability of the aspects of this study. The questionnaire has been checked, pilot-tested and revised accordingly so that it can be a reasonable mean of collecting data. Consequently, it can be understood by different respondents the way it is intended by the researcher. In addition, Pearson Correlation Coefficient (Annex A) is used where it shows that there are significant positive correlations at level 0.01 (2-tailed) between the four factors of the study. Hence, we assume a strong internal consistency among the factors under study.

5. Results

5.1 Classifications and Characteristics of Organizations

Respondents are asked to specify the nature of the sectors of activity of their organizations; results are presented in Table 2.

Table 2: Classification of Firms by Sector of Activity

Type of Activity	Frequency	Percent
Manufacturing Firms	41	**11.8**
Service Firms (Bank, Telecommunication, Insurance)	92	**26.4**
Hospitals or Clinics	98	**28.2**
Government Agencies	71	**20.4**
University or Educational Institutions	46	**13.2**
Total	348	**100**

From Table 2, we can see that the majority of firms in the study are from the healthcare sectors making more than 28% of respondents followed by the service industry which represents over 26% while government agencies come third with more than 20% of respondents. Educational institutions along with the manufacturing companies come fourth and fifth respectively. The distribution of the sample does not necessarily represent the real weight of such firms in the country; it is merely the nature of the sample as having many students from the healthcare system of the country. However, we may assume that the figure of the manufacturing companies may be close to the reality since the manufacturing sector in Saudi Arabia representation is still limited due to the nature of such business.

Table 3: Characteristics of Health and Safety Environment in Organizations

Part I: If the Organization is Certified to OHSAS 18001		
	Frequency	**Percent**
Yes	80	**23.0**
No	268	**77.1**
Total	348	**100**
Part II: If the Organization has Health & Safety Department		
	Frequency	**Percent**
Yes	**190**	**54.6**
No	**158**	**45.4**
Total	**348**	**100**

Table 3 depicts the health and safety environment nature in organizations under study. Part I of the table shows that the vast majority of firms are not certified to OHSAS 18001 representing little over 77% of organizations while the remaining percentage claiming that they are certified. Nevertheless, we may assume that there is some exaggeration on that figure knowing that certification to OHSAS 18001 in the country is most likely not in that size. Moreover, some organizations are under certification of the standard and are not fully certified to OHSAS 18001. Part II of Table 3 reveals that almost 54.6% of organizations under study have occupational and health departments while the remaining 45.4% do not have. These figures are not promising in this field and conclude that there is a shortcoming and deficiency in the occupational health and safety workplace environment in Saudi Organizations in general.

5.2Health and Safety Workplace Environment

This section includes the four factors that represent a reasonable health and safety workplace environment in the organization according to OHSAS 18001: 2007. These factors are; hazard identification, top management support of occupational health and safety programs, communication and participation of occupational health and safety system and emergency preparedness and response. The following four subsections present respondent evaluation of their organizations systems.

5.2.1Hazard Identification

In this section, respondents of the study are asked to specify their uses of the four functions related to hazard identification in their organizations. Results are shown in Table 4.

Table 4: Hazard Identification Practices in Organizations

Practice	**Std. Dev.**	**Mean**	**Representation**	**Rank**
There are procedures to identify hazards related to infrastructure, equipment and materials	1.39	2.73	Sometimes	**1**
Identify hazards originating outside the work place that can affect health and safety of personnel in the organization	1.31	2.36	Rarely	**2**
Procedures of hazard identification and risk assessment include all employees, visitors and contractors	1.39	2.15	Rarely	**3**
Procedures of hazard identification and risk assessment cover human behavior, capabilities and other human factors	1.21	2.15	Rarely	**4**
Average Mean		2.35	Rarely	

The table shows that with the practices related to hazard identification among Saudi organizations is generally poor. The average mean of this practice is 2.35 which represent a "Rare" use of this function in organizations under the current study.

5.2.2Top Management Support of Occupational Health and Safety Programs

In this question, respondents to the questionnaire are asked to assess their practices related to top management support of occupational health and safety (OH&S) programs in their organizations. Results of this factor are depicted in Table 5.

Table 5: Top Management Support Practices in Organizations

Practice	Std. Dev.	Mean	Representation	Rank
Top management takes the ultimate responsibility of OH&S System in the organization	1.30173	3.34	Often	**1**
Top management provides the essential resources of establishing OH&S System	1.30862	3.15	Sometimes	**2**
Top management follows reports on the performance of the OH&S management system	1.2868	3.08	Sometimes	**3**
Top management assigns roles and allocates responsibilities and accountability to facilitate effective OH&S system	1.30009	3.20	Sometimes	**4**
Average Mean		3.19	Sometimes	

Table 5 shows that senior managers support in Saudi Arabia of the organizations under study support the issues of occupational health and safety in an average manner (Mean = 3.19). Their support as shown in the table is not high. This implies a shortage in the support on this regard which poses a problem since the support of top management leaders is vital since they have the resources and empowerment they can provide to their organizations and personnel. In turn, this weak support may result in a threatening environment for employees, workers and visitors.

5.2.3Communication and Participation of Occupational Health and Safety (OH&S) System

Regarding the communication of the health and safety requirements, respondents are asked to evaluate the practices of their organizations on this regard. Results are shown in Table 6.

Table 6: Communication and Participation of OH&S System

Practice	Std. Dev.	Mean	Representation	Rank
Organization ensures the display of posters regarding the OH&S inside its vicinities	1.30	3.25	Sometimes	**1**
Organization ensures that personnel undergone appropriate OH&S training programs	1.31	2.76	Sometimes	**2**
Organization ensures that personnel are aware of the potential or actual consequences of their OH&S system	1.33	2.92	Sometimes	**3**
Organization ensures that personnel are aware of the consequences if they depart from specific procedures in health and safety	1.24	2.83	Sometimes	**4**
Average Mean		2.93	Sometimes	

Table 6 reveals that,the communication and participation practices in the organizations under study are of average level. The average Mean of the four elements of this factor is 2.93 which indicate the second worst accomplishment of such organizations after hazard identification. It appears that organizations in general do not provide reasonable communication and participation efforts to their employees.

5.2.4 Emergency Preparedness and Response

The fourth factor that is investigated in this study is the readiness and response of organizations under study to the emergency and threatening situations. Respondents are asked to evaluate their practices on this regard. Results are shown in Table 7.

Table 7: Emergency Preparedness and Response in Organizations

Practice	Std. Dev.	Mean	Representation	Rank
Organization has written procedures to identify potential for emergency situations	1.35489	3.33	Sometimes	**1**
Organization has written procedures on how to respond to emergency situations	1.36365	3.29	Sometimes	**2**
Organization performs periodical virtual cases on how to respond to emergency situations	1.46326	3.01	Sometimes	**3**
Organization reviews and amends its procedures periodically regarding the dealing with emergency situation	1.35875	2.89	Sometimes	**4**
Average Mean		3.13	Sometimes	

Table 7 indicates a low performance in the preparedness and response of organizations under study to the emergency situations encountering them. Mean average of this factor is 3.13 which include four sub factors all of which remain in the "sometimes" category. As the case of the previous two factors, the accomplishment of Saudi organizations is limited; which may pose a threat to the occupational health and safety environment.

5.3 Differences between Sectors of Activities

We use One Way Anova test to find out if there is significant differences between types of organizations in performing the four factors using the average mean of such factors. Results are displayed in Table 8.

Table 8: One Way Anova for the Differences between Types of Organizations

S.O.V	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	14366.758	4	3591.690	14.635	**.000**
Within Groups	84179.092	343	245.420		
Total	98545.851	347			

Table 8 shows that, there are significant differences between the types of organizations in performing the occupational and health functions under study. The value is significant (Sig. =0.000) which is below .05 (the significant level). Nevertheless, this test does not show the ranking of organizations in the performance, hence, we use Scheffe test for this purpose shown in the following Table 9. On that table, manufacturing firms comes first followed by hospitals and clinics, service firms come third, university and educational institutions come fourth and finally the government agencies rank least. Apparently manufacturing firms and hospitals come first and second since they have strict procedures in health and safety matters due to the nature of their business.

Table 9: Scheffe Test for Ranking Organizations

	Type of Activity	N	Subset for alpha = 0.05		
			1	2	3
Scheffe	Manufacturing Firms	41			60.7073
	Hospitals or Clinics	98		49.0816	
	Service Firms	92		47.8696	
	University or Educational Institutions	46	42.8913	42.8913	
	Government Agencies	71	38.2817		
	Sig.		.616	.310	1.000

5.4 Differences between Organizations based on OHSAS 18001 Certification

We use Independent Samples t-test to know if organizations under study differ significantly on their performance of the occupational health and safety requirements based on OHSAS 18001certification.

The results are shown in Table 10 where it reveals that there is a significant differences (Sig. = 0.000) between organizations that have OHSAS 18001 and those that do not have the standard (the value is lower than 0.05). Moreover, in that table, organizations that hold OHSAS 18001 mean is 15.80389 while those that are not have mean of 14.17699.

Table 10: Independent Samples t-test (Whether Organizations Hold OHSAS 18001 or not)

	N	Mean	Std. Deviation	t	Sig
Yes	80	59.5125	14.17699	8.678	**0.000**
No	268	43.4067	15.80389		

5.5 Differences between Organizations based on OH&S Departments

In this section, we will use Independent Samples t-test to know if there is a significant difference between organizations that have occupational health and safety department and those that do not have. Results are shown in the following Table 11 where it reveals that there is a significant difference (sig. = 0.000) in favor of those organizations that have OH&S departments. The Means of those with OH&S departments is 56.1211 while others mean is 36.2722.

Table 11: Independent Samples t-test (whether Organizations have OH&S Departments or not)

	N	Mean	Std. Deviation	T	Sig
Yes	190	56.1211	13.51038	13.466	**0.000**
No	158	36.2722	13.83739		

6. *Discussion and Policy Implications*

This study is probably the first in its nature in Saudi Arabia, based on the best knowledge of the researcher. It reveals a problem in the observance of the occupational health and safety among Saudi organizations. Educational institutions along with the government agencies performed the worst on this matter which may pose a threat to the people using the facilities and buildings. During the rain floods in Jeddah, Saudi Arabia of 2008, the city encountered huge problems that uncovered a lack of the existence of contingency and emergency plans in the city. Other cities did not encounter such natural disaster; otherwise, they might have had the same threatening situation that Jeddah had. Many firms in Saudi Arabia work in the petrochemicals and oil field and deal with highly hazardous materials, hence, they require tougher procedures in health and safety matters. Apparently, there is a need to pay attention to the occupational health and safety in the organizations in general using the concept of prevention rather than correction. Based on the findings of this current study, manufacturing firms perform better than all other organizations; hence we may assume that such organizations pay more attention to health and safety matters than other organizations.

In 2014, King Abdulaziz University introduces a master degree in crises management providing a high class up to the date education to the public in this discipline. People working in civil defenses jobs along with employees working in the health and safety departments can benefit from this program. The government is also responsible for imposing tougher requirements for establishing occupational and health departments no matter how small the organization may be, even if this department has the least first aid materials. The Ministry of Industry has to observe oversight and control matters related to health and safety in the industry. In addition, civil defense authorities that provide license for business to a range variety of shops should also make sure of the existence of the occupational health and safety requirements. Finally, as the case of ISO 9001 and ISO 14001, the different governmental agencies may encourage organization to obtain OHSAS 18001 or equivalent standard that might provide such organizations with a great help on this matter.

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Annex A: Pearson Correlations Coefficient between the Four Factors

		Hazard Identification	Top Management Support	Communication Participation	Emergency Preparedness
Hazard Identification	Pearson Correlation	1	.699**	.723**	.667**
	Sig. (2-tailed)		.000	.000	.000
	N	348	348	348	348
Top Management Support	Pearson Correlation	.699**	1	.745**	.673**
	Sig. (2-tailed)	.000		.000	.000
	N	348	348	348	348
Communication and Participation	Pearson Correlation	.723**	.745**	1	.794**
	Sig. (2-tailed)	.000	.000		.000
	N	348	348	348	348
Emergency Preparedness and Response	Pearson Correlation	.667**	.673**	.794**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	348	348	348	348

**. Correlation is significant at the 0.01 level (2-tailed).