

The Impact of Saudi Hospital Accreditation on Occupational Safety Culture: Study on Jazan Hospitals

Younes Alibraheem¹, Mohamed Zytoon²

^{1,2}Department of Industrial Engineering, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract - The healthcare sector is one of the most important service sectors in any country, because it deals with human life and it means in many instances death or survival. One of the procedures taken by the Saudi government to improve that sector is to launch the Central Board for Accreditation of Healthcare Institutions (CBAHI). It's expected that accreditation has positive impact on various aspects of the operations of an organization, including work procedures, product/service quality, employees and managers culture, human performance and safety, communication, etc. So, the purpose of this research is to evaluate Saudi accreditation impact on the occupational safety culture in the accredited hospitals compared to non-accredited hospitals. In this research, safety culture questionnaire (SCQ) distributed to two groups of accredited and non-accredited hospitals. SCQ was designed based on 6 dimensions which are management commitment (MC), training and awareness (TR), communication (COM), supportive environments (SUP), personal priorities and risk appreciation (PPR) and work environment (WE). The results of the questionnaire higher scores for non-accredited hospitals in most of the safety culture dimensions, which means that the accreditation had no observable positive impact on occupational safety culture. However, this shouldn't hinder the positive impacts of accreditation on other operational aspects. CBAHI accreditation system is a system designed to improve quality of healthcare sector in Saudi Arabia. Occupational safety is an important aspect of work and, therefore, any accreditation system, including CBAHI, should reflect on it positively. It recommended that CBAHI standard to be updated so that its requirements include the minimum occupational safety level.

Key Words: Safety Culture, CBAHI, Occupational safety and health, Accreditation system, Healthcare safety.

1. Introduction:

One of the procedures taken by the Saudi government to improve that sector is to launch the Central Board for Accreditation of Healthcare Institutions (CBAHI) in 2005, and the first hospital was accredited in 2010. Later on, a series of more than 200 governmental and private hospitals was accredited with continuous updating for CBAHI standards.

It's expected that accreditation has positive impact on various aspects of the operations of an organization, including work procedures, product/service quality,

employees and managers culture, human performance and communication. In addition to these, occupational safety and health is an important aspect of work that should be considered in every management system.

Occupational safety and health (OSH), is a multidisciplinary field concerned with the safety, health, and welfare of people at work. World Health Organization (WHO) definition of OSH is "occupational health deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards". [1]

Many industries around the world are showing an increasing interest in the concept of 'safety culture' as a means of reducing the potential for large-scale disasters, and accidents associated with routine tasks. Publicly stated aims of achieving homogeneous worldwide safety cultures in the offshore, nuclear and shipping industries testify to its growing importance. [2] The term 'safety culture' first came to prominence as a result of the International Atomic Energy Agency's (IAEA) initial report on the Chernobyl nuclear accident [3]. Since then it has been discussed in other major accident enquiries and analyses of safety failures, such as the Piper Alpha oil platform explosion in the North Sea and the Clapham Junction rail disaster in London. In both cases the Public Inquiry report argued that a poor safety culture within the operating company was an important determinant of the accident. [4][5]

According to the Institute of Medicine, "the biggest challenge to moving toward a safer health system is changing the culture from one of blaming individuals for errors to one in which errors are treated not as personal failures, but as opportunities to improve the system and prevent harm". [6] Furthermore, the Department of Health, UK noted that safety cultures can have a positive and quantifiable impact on the performance of organizations. [7]

Healthcare services in Saudi Arabia have been given a high priority by the government. During the past few decades, health and health services have improved greatly in terms of quantity and quality. [8] Gallagher (2002) has stated that "although many nations have seen sizable growth in their healthcare systems, probably no other nation (other than Saudi Arabia) of large geographic expanse and population has, in comparable time, achieved so much on a broad national scale, with a relatively high level of care made available to virtually all segments of the population." [9]

The CBAHI was formed in 2005 with the mission of to continuous improvement of the safety and quality of healthcare services in the Kingdom of Saudi Arabia by supporting the healthcare facilities to continuously comply with the accreditation standards. [10] CBAHI standards set expectations for hospital performance that are reasonable, attainable, measurable and therefore, surveyable. Standards were built to serve as the basis of an objective evaluation process that can help healthcare facilities measure, assess and improve performance. [10]

The objective of the current research is to assess the safety culture of hospital staff, including physicians, nurses, administrative employees and managers in a sample of both accredited and non-accredited hospitals in Jazan district in order to find out whether there is a relationship between hospital accreditation (based on CBAHI requirements) and safety culture.

2. Methodology

The study was conducted in six hospitals in Jazan region divided equally into CBAHI-accredited and non-accredited

hospitals. The safety culture questionnaire was prepared to measure many aspects of occupational safety culture from the point of view of participants who are working in MOH hospitals. The dimensions of safety culture assessed in this study were extracted from several studies about safety culture in many sectors. The dimensions are: Management commitment (MC), Training and awareness (TR), Communication (COM), Supportive environments (SUP), Personal priorities and risk appreciation (PPR) and Work environment (WE). The total number of questions under all dimensions was 25. A 5-point Likert scale was used, in which 1, 2, 3, 4 and 5 meant strongly disagree, disagree, neutral, agree and strongly agree, respectively. The term "neutral" was selected when participant can't specify his answer between "agree" and "disagree". It's does not mean "do not know" nor "not applicable".

The Questionnaires included some demographic characteristics of the respondents as shown in detail in Table (1).

Accredited Hospitals						Non-accredited Hospitals					
Career level			Years of Experience			Career level			Years of Experience		
Level	No.	%	Group	No.	%	Level	No.	%	Group	No.	%
Consultant	12	5.19	0-5	73	31.60	Consultant	2	0.91	0-5	72	32.88
Specialist	22	9.52	6-10	96	41.56	Specialist	12	5.48	6-10	74	33.79
Resident	15	6.49	11-15	35	15.15	Resident	9	4.11	11-15	35	15.98
Nurse	91	39.39	16-20	14	6.06	Nurse	75	34.25	16-20	21	9.59
Med. Specialty	52	22.51	>20	13	5.63	Med. Specialty	66	30.14	>20	17	7.76
Admin.	24	10.39	Total	231	100%	Admin.	30	13.70	Total	219	100%
Other	15	6.49				Other	25	11.42			
Total	231	100%				Total	219	100%			

Table (1): Demographic characteristics of the sample

The populations targeted in the accredited and non-accredited hospitals were 1087 and 1015, respectively. Therefore, based on Cochran's formula for sample size calculation [11], the target sample size was decided to be 285 in accredited hospitals and 279 in non-accredited hospitals (95% confidence level and 5% maximum error). The total number of distributed questionnaires was 800 (i.e., 400 for each category of hospitals). However, the response rates were 241 (60.25%) and 226 (56.5%) for accredited and non-accredited hospitals, respectively. In addition, because of the elimination of some forms for quality reasons or inadequately information the considered responses were 231 and 219, respectively. Assuming the same level of confidence (i.e., 95%), the errors slightly increased to 5.61% and 5.92%, respectively, which are still acceptable. Table (2) shows the details of response rate and expected errors in the questionnaires results.

Table (2): Response and errors of questionnaires

Questionnaire	Response		Eliminated forms	No. of Samples	Error %
	No.	%			
SCQ - Accredited	241	60.25	10	231	5.61%
SCQ- Non-accredited	226	56.5	7	219	5.75%
Total	467		17	450	

A series of statistical analyses were conducted depending on the purpose of the analysis. The reliabilities of the Safety culture questionnaire (SCQ) was measured using the Cronbach alpha test. [12] The value of α statistic is used to test a group of questions (elements) that measure the same dimension or in other words the internal consistency of the construct questions. A value of $\alpha \geq 0.6$ was describes qualitatively to be acceptable or sufficient as a proof of the reliability of the questionnaire questions. [13]

The One-Way Analysis of Variance (ANOVA) was used to test mean score of dimensions with respect to three characteristics which are career level, years of experience and facility age for both accredited and non-accredited at a P -value of 0.05 as the significance level.

Finally, comparison between mean scores of elements and dimensions for accredited hospitals versus non-accredited was presented.

3. Results

Table (3) shows the Cronbach's α of (SCQ) for accredited and non-accredited hospitals that present Cronbach's α higher than 0.6 in all dimensions except personal priorities and appreciation of risk which was less than 0.6. That results reflect good consistency of questions toward each other inside these dimensions, which mean also that each set of questions measured the relevant dimensions in appropriate manner. Also, the overall Cronbach's α for the whole dimensions of questionnaire was (0.74) and (0.82) for accredited and non-accredited, respectively.

Table (3): Cronbach's α of (SCQ)

Dimensions	Cronbach's α for Accredited	Cronbach's α for Non-accredited
MC	0.70	0.78
TR	0.65	0.74
COM	0.64	0.71
SUP	0.65	0.71
PPR	0.12	0.52
WE	0.62	0.68
Overall	0.74	0.82

Figure (1) shows the mean averages of the SC dimensions for both accredited and non-accredited hospitals. Surprisingly, except for PPR, all other dimensions were scored in the accredited lower than the non-accredited hospitals. However, the differences were insignificant in all dimensions except for the MC one as shown in Table (4) which shows the results of ANOVA for the SC dimensions of accredited hospitals versus non-accredited hospitals.



Fig. (1): Mean averages for dimensions of safety culture (Accredited vs non-accredited)

Table (4): Results of ANOVA of safety culture dimensions for accredited versus non-accredited hospitals

Dimensions	F-Value	P-Value	R^2
MC	1.79	0.024	15.28%
TR	1.45	0.125	9.70%
COM	1.51	0.122	8.09%
SUP	0.85	0.629	6.30%
PPR	1.01	0.448	7.41%
WE	1.19	0.279	9.12%

Table (5) shows the results of ANOVA (F -value and P -value) for the relationship between safety culture dimensions and the sample characteristics: career level, years of experience and facility age for both accredited and non-accredited hospitals. There were significant differences between accredited and non-accredited hospitals in the safety culture dimensions MC and TR with respect to career level, years of experience and facility age. In other dimensions (except for PPR), the difference was significant also with respect to facility age. However, there was variability with respect to other characteristics in other dimensions.

4. Discussion

Management commitment (MC) dimension was scored 3.37 in accredited and 3.59 in non-accredited hospitals on 5-point Likert scale with significant difference between them. Surprisingly, the average score of accredited hospitals was found lower than the averages in other sectors. [14][15] Also, it was found that the main determinant of commitment to the safety was the strength of employees' attitude with regard to "management actions" which also determined attitude to "personal actions for safety" and were related to

the "quality of safety trainings" which means high effectiveness of management commitment on safety culture and organizational safety performance. [16]

The training and awareness (TR) dimension was scored 3.59 and 3.62 for accredited and non-accredited hospitals, respectively. These scores are not consistent with the implemented systems in the accredited hospitals which logically should be better than non-accredited ones. Training and awareness programs should be effective if they are properly implemented [17][18] as they were found to yield significant changes in the safety knowledge and awareness when pre-training evaluation was compared to post-training

evaluation. [19] This situation calls for serious attempts to improve safety training and awareness in the accreditation system.

The average scores of the communication (COM) dimension were 3.39 and 3.50 for accredited and non-accredited hospitals. Compared to other studies [20], the COM dimension was lower in the current study, which means that the communication procedures are inefficient, especially in accredited hospitals.

Table (5): ANOVA results of the relationship between safety culture dimensions and the sample characteristics for accredited and non-accredited (bold values means statistically significant)

Dimensions	Career Level				Years of experience				Facility age			
	Accredited		Non-accredited		Accredited		Non-accredited		Accredited		Non-accredited	
	F-value	P-value	F-value	P-value	F-value	P-value	F-value	P-value	F-value	P-value	F-value	P-value
MC	1.34	0.239	2.25	0.039	0.7	0.593	2.47	0.046	0.78	0.377	23.31	0
TR	0.9	0.498	4.68	0.000	1.45	0.217	2.64	0.035	1.01	0.317	23.92	0
COM	1.88	0.086	3.72	0.002	1.09	0.362	1.47	0.212	1.1	0.295	33.15	0
SUP	3.05	0.007	1.67	0.13	1.15	0.334	1.3	0.271	1.58	0.21	15.86	0
PPR	1.08	0.375	1.85	0.091	1.7	0.152	1.03	0.393	0.46	0.501	1.04	0.309
WE	2.43	0.027	2.54	0.022	2.21	0.069	1.57	0.184	24.2	0	37.71	0

Implementation of communication-related elements in the accreditation system are crucial in improving safety culture since an organizational climate of open communication with a focus on problem-solving and learning is vital to safety and is associated with safety communication so that employees feel comfortable to raise and express safety concerns. [21] In line with the above dimensions, the supportive environment (SE) dimension was scored 3.58 and 3.64 in accredited and non-accredited hospitals, respectively. An accreditation system should create a supportive environment that, in turn, improves safety issues. [22] When workers perceive that their organizations are supportive, concerned, and interested in their general well-being, they are more likely to perceive that their organizations value their safety as well. [23]

The general work environment (WE) dimension was scored very low, being 3.18 and 3.20 for accredited and non-accredited hospitals, respectively. The scores were the lowest among all other dimensions. The score is inconsistent, especially in accredited hospitals, with the results in other studies. [24][25] The work environment can substantially influence an individual's perceptions of task dimensions [26], and the safety outcomes are associated

with the work environment within which the employee practices. [27] Based on this, a good work environment means safe workplace that encourages employees to implement safety requirement.

The only dimension which was scored higher in the accredited hospitals was the personal priorities and appreciation of risk (PPR), being 3.78 compared to 3.70 for non-accredited hospitals. Both scores are the highest averages among those of all dimensions. Generally, these scores were in line with other studies interested in risk assessment and appreciation. [28][29] Implementing and maintaining risk control measures is usually a function of carefully designed safety management systems together with effective monitoring and auditing. Priority controls should be documented as a means of ensuring effective auditing and conformity with the principles of total quality management. [30] Thus, risk appreciation is an important element to improve different aspect of safety.

5. Conclusions

In the current study, a comparison between CBAHI-accredited and non-accredited hospitals with respect to occupational safety culture was conducted using a safety culture questionnaire (SCQ) consisting of 6 dimensions. Analyzing the data, the questionnaire reliability was found acceptable. Unexpectedly, it was found that the safety culture scores from the accredited hospitals respondents were lower than those from non-accredited ones except for one dimension. This calls for urgent need to revise the way the hospital follow to implement the accreditation system. Any management system should reflect positively on all aspects of the organization work, including occupational safety. This means that occupational safety issues should be included in the guidelines for implementing the management system elements. Furthermore, safety culture issues should be kept in mind in the auditing process of the accrediting agency before issuing an accreditation to a hospital.

REFERENCES

- [1] World Health Organization. "Occupational Health". www.who.org retrieved 2019-10-15
- [2] Cooper, M. D. (2000). Towards a model of safety culture. *Safety science*, 36(2), 111-136.
- [3] IAEA. (1986). Summary report on the post-accident review meeting on the Chernobyl accident. IAEA Safety Series, 75.
- [4] HIDDEN, A. 1989, Investigation into the Clapham Junction Railway Accident (London: HMSO/ Department of Transport)
- [5] CULLEN, D. 1990, The Public Inquiry into the Piper Alpha Disaster (London: HMSO).
- [6] Committee on Quality of Health Care in America, & Institute of Medicine Staff. (2001). Crossing the quality chasm: A new health system for the 21st century. National Academies Press.
- [7] Department of Health, 2000. An organisation with a memory: Report of an expert group on learning from adverse events in the NHS chaired by the Chief Medical Officer. HMSO, London
- [8] Almalki, M., FitzGerald, G., & Clark, M. (2011). Health care system in Saudi Arabia: an overview.
- [9] Gallagher, E. B. (2002). Modernization and health reform in Saudi Arabia. *Health care reform around the world*, 181-97.
- [10] CBAHI, (2015), Central Board of Accreditation for Healthcare Institutions Accessed on 9 May 2015. Available from: <https://portal.cbahi.gov.sa>
- [11] Cochran, W. G. (1963). *Sampling Techniques*, 2nd Ed. New York: John Wiley and Sons, Inc.
- [12] Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334.
- [13] Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48(6), 1273-1296.
- [14] Mungai, M. M., & Irungu, R. I. (2013). An Assessment of management commitment to application of green practices in 4-5 star Hotels in Mombasa, Kenya.
- [15] O'Toole, M. (2002). The relationship between employees' perceptions of safety and organizational culture. *Journal of safety research*, 33(2), 231-243.
- [16] Cox, S., Tomás, J. M., Cheyne, A., & Oliver, A. (1998). Safety culture: The prediction of commitment to safety in the manufacturing industry. *British Journal of management*, 9, 3-11.
- [17] Sokas, R. K., Jorgensen, E., Nickels, L., Gao, W., & Gittleman, J. L. (2009). An intervention effectiveness study of hazard awareness training in the construction building trades. *Public Health Reports*, 124(4_suppl1), 161-168.
- [18] Yunus, N. A., Abdullah, M. H. R. O., Said, M. A., & Ch'ng, P. E. (2014). Assessment of radiation safety awareness among nuclear medicine nurses: a pilot study. In *Journal of Physics: Conference Series* (Vol. 546, No. 1, p. 012015). IOP Publishing.
- [19] Helmkamp, J. C., Bell, J. L., Lundstrom, W. J., Ramprasad, J., & Haque, A. (2004). Assessing safety awareness and knowledge and behavioral change among West Virginia loggers. *Injury prevention*, 10(4), 233-238.
- [20] Boughaba, A., Hassane, C., & Roukia, O. (2014). Safety culture assessment in petrochemical industry: a comparative study of two Algerian plants. *Safety and health at work*, 5(2), 60-65.
- [21] Cigularov, K. P., Chen, P. Y., & Rosecrance, J. (2010). The effects of error management climate and safety communication on safety: A multi-level study. *Accident Analysis & Prevention*, 42(5), 1498-1506.

- [22] Ayim Gyekye, S., & Salminen, S. (2007). Workplace safety perceptions and perceived organizational support: do supportive perceptions influence safety perceptions?. *International Journal of Occupational Safety and Ergonomics*, 13(2), 189-200.
- [23] Eisenberger, R., Armeli, S., Rexwinkel, B., Lynch, P. D., & Rhoades, L. (2001). Reciprocation of perceived organizational support. *Journal of applied psychology*, 86(1), 42.
- [24] Torp, S., & Moen, B. E. (2006). The effects of occupational health and safety management on work environment and health: A prospective study. *Applied ergonomics*, 37(6), 775-783.
- [25] Papadopoulos, G., Georgiadou, P., Papazoglou, C., & Michaliou, K. (2010). Occupational and public health and safety in a changing work environment: An integrated approach for risk assessment and prevention. *Safety science*, 48(8), 943-949.
- [26] Richard, H. J., & Oldham, G. (1976). Motivation through the design of work: Test of a theory. *Organizational behavior and human performance*, 16(2)), 250-79.
- [27] Kirwan, M., Matthews, A., & Scott, P. A. (2013). The impact of the work environment of nurses on patient safety outcomes: a multi-level modelling approach. *International journal of nursing studies*, 50(2), 253-263.
- [28] Pinto, A., Nunes, I. L., & Ribeiro, R. A. (2011). Occupational risk assessment in construction industry– Overview and reflection. *Safety science*, 49(5), 616-624.
- [29] Cioca, L. I., Moraru, R. I., & Băbuț, G. (2010). Occupational risk assessment: a framework for understanding and practical guiding the process in Romania. In *Proc. Int. Conference on Risk Management, Assessment and Mitigation (RIMA'10)* (Vol. 56, No. 61, pp. 20-22).
- [30] Joy, J. (2004). Occupational safety risk management in Australian mining. *Occupational medicine*, 54(5), 311-315.