

The impact of training & developmental practices on the application of total quality management: an empirical study at the ministry of health hospital, Egypt

Abstract

The present study was conducted to bring the attention to the importance of Training & the other developmental practices as elements of Human Resource Development (HRD) in improving healthcare output as being monitored by hospitals' key performance indicators (KPIs) through applying the total quality management (TQM) strategy at Ministry of Health (MOH), Egypt.

The study population represented a sample of healthcare professionals from 35 MOH hospitals, 164 employees were included in the study sample, the response rate was 98.5% of the total questionnaires distributed. As based upon Kirkpatrick Model, et al.1979,¹ evaluation of the training effectiveness was customized in this study at level 4 only (which is mainly concerned about assessing "Results" & reflects the evaluation of training's impact on the organization's business results). Data collection sheet was used to collect values of the most common hospitals KPIs (16 indicators) from the 35 hospitals over 6 years period (2009 to 2014) which had been used to monitor & evaluate quality performance improvement at MOH hospitals.

The obtained findings showed no significant ($p>0.10$) impact of the training & other developmental practices of the hospital's quality teams as a whole on improving quality performance (as being assessed by the hospital KPIs score change) when applying TQM principles. Perusal analysis of the data also showed that healthcare professionals' training in the field of quality was not a predictor of hospital performance improvement ($p\text{-value}>0.10$).

The descriptive study findings identified that lack of resources, motivation & leadership support were the most common obstacles for learning transfer. Also, employees resistant to change were the main challenge facing healthcare professionals to apply TQM as being expressed by the study targeted responders. The current study also revealed a lack of knowledge & skills regarding training evaluation methodology as well as underestimation of its importance in decision-making.

Keywords: hospital key performance indicators, human resources development, learning transfer, total quality management

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Samia Elshafie,¹ Abd Elmoneim Eltohamy,¹ Bahgat Edrise²

¹Business administration, Helwan University, Egypt

²School of Veteran Medicine, Cairo University, Egypt

Correspondence: Samia Elshafie, Business administration, Helwan University, Egypt, Tel 1-805-377-6141, Email drselshafie@hotmail.com

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Abbreviations: A/P, Is an efficiency ratio that measures the average number of days a company/hospital takes to pay its suppliers; A/R, The AR ratio calculates the average length of time it takes for medical claims to get paid (receivable); ALOS, Average length of stay in hospital; CMS, Core measure score; HAI, Hospital-acquired infection; HRD, Human resource development; ICU, Intensive care unit; KPIs, Key performance indicators; MOH, Ministry of health; NICU, Neonatal intensive care unit; SAI, Surgical acquired infection; TQM, Total quality management

Introduction

Healthcare services worldwide are now facing significant challenges. There are constant medical and technological advances to keep pace with, the population is growing in size and people are living longer but often in poor health, moreover the demand for healthcare outstrips the available staffing and financial resources.² Many years ago, developed countries implemented TQM strategies in all healthcare-related organizations as this was one of the best solutions to improve health status and services.³

Egypt was among the developing countries which adopted such concepts & started to exercise various TQM activities in primary healthcare (PHC) & hospitals. Since November 2003 MOH exert a huge effort to implement TQM in its hospitals to meet the ever-rising demands, improve the quality of patient care & to assure patient safety.⁴ To facilitate such a crucial change, different forms of training activities have been implemented & considerable attention was paid to improving the quality of care in the public healthcare system because of both the need to respond to customer concerns and costs considerations. The common methods for training healthcare professionals in quality improvement involve classroom or workshop style teaching, simulations, and role-playing, collaborative and on-the-job training, either at participants' places of work or at other venues.

Those training programs provided some skills needed for capacity building & quality performance management. Since 2003; Millions of Egyptian pounds had been spent for human resource development (HRD) either from MOH annual budget, from funding agents, or even from employees' own pocket money that were not satisfied

by training & were looking for upgrading & developing their skills through formal post-graduate education. It's well known that impact assessment of training & education orchestrates cost-effectiveness and reengineering of capacity building programs needed by MOH-stakeholders to facilitate improving quality performance within their healthcare institutions.

“There is no single published report, study, or research done in Egypt to investigate the impact of such training/ capacity-building activities on improving the employee performance or assessing the impact of their performance on improving the score of their hospital key performance indicators.”

Human resource development in the field of TQM

Nadler, et al. 1990,⁵ defined HRD as “organized Learning experiences in a definite period to increase the possibility of improving job performance and growth. HRD focused on improving the job performance and growth of the employee. Training, education, and development are the three areas of learning in HRD.”⁵

According to Clinton et al.; 1994⁶ employees require three basic areas of training to apply TQM: principles of TQM, the use of TQM tools, and problem-solving techniques. There is an assumption that training in quality improvement makes a difference as training can influence participants' knowledge and confidence, but most studies have not explored whether training directly results in positive outcomes for service users, care quality, or resource use.⁷ Research findings suggested that a lack of knowledge and skills among clinicians and managers is a significant barrier to improving quality in healthcare.⁸ The Health Foundation believes that training can be an effective lever for improving the quality of healthcare. Yet education and training initiatives are not always prioritized by policymakers or practitioners.⁹

Learning transfer

Transfer of learning is effectively and continually applying the knowledge, skills, and/or attitudes that were learned in a learning environment to the job environment. It's well known worldwide for so many decades that Learning Transfer will enhance the Impact of Learning on Performance.^{10,11}

Evaluating learning and development

The fundamental purpose of learning and development is to help people develop skills that, when applied to work, enhance job and organizational performance. While this is widely acknowledged, how we measure the success of learning is not often in alignment with this idea. The most popular model for evaluating learning and development is the Kirkpatrick Model, et al.1979.,¹ which has three “levels” devoted to measuring learning outcomes, and only one measuring performance outcomes. This often entails using the four levels model developed by Kirkpatrick Model, et al.1979.,¹ which details:

Level one: Reaction - what the participant thought and felt about the training.

Level two: Learning - the resulting increase in knowledge or capability.

Level three: Transfer - the extent of behavior and capability improvement and implementation /application. Level four: Results -

the effects on the business or environment resulting from the trainee's performance.

Total quality management

TQM is formally defined as a management philosophy and company practices that aim to harness the human and material resources of an organization in the most effective way to achieve the objectives of the organization.¹²

Job performance & Key performance indicators

Job performance generally refers to behavior that is expected to contribute to organizational success.¹³ A performance indicator or key performance indicator (KPI) is industry jargon for a type of performance measurement only used by an organization to evaluate its success or the success of a particular activity in which it is engaged. Choosing the right

KPIs is reliant upon having a good understanding of what is important to the organization.

There are 16 known international KPIs used for monitoring / evaluation the hospital business process divided into two categories, according to the whitepaper (international) “The Skinny on Healthcare KPIs “ are hereunder listed:

Category A (Inpatient flow):

- a. Inpatient raw mortality rate
 - b. CMS (core measure score)
 - c. Harm events per 1,000 patient days
 - d. Bed turnover
 - e. Readmission rate
 - f. Occupancy rate
 - g. The average length of stay
 - h. The average cost per discharge
 - i. Patient satisfaction
- #### Category B (Revenue cycle):
- j. Total operating margin
 - k. A/R days due to coding
 - l. Total A/R days outstanding
 - m. Total A/P days outstanding
 - n. Cash receipt to bad debt
 - o. Claims denial rate
 - p. Days of cash on hand

In Egypt, some modification were done after benchmarking & customization, KPIs used in Egyptian hospitals are as follows:¹⁴

- a. Inpatient Volume
- b. Outpatient Volume
- c. Outpatient/Inpatient Ratio
- d. The gross unadjusted inpatient mortality rate
- e. ICUs mortality rate

- f. Gross unadjusted mortality (within 24 hours of admission) rate
- g. NICU mortality rate
- h. Hospital-acquired infection rate
- i. Surgery acquired infection rate
- j. The readmission rate for inpatient within 30 days
- k. The readmission rate for emergency patients within 72 hours
- l. The average length of stay (ALOS)
- m. Bed Occupancy rate (inpatient)
- n. Bed Occupancy rate (ICUs)
- o. Bed turn over (inpatient)
- p. Bed turn over (ICU)

Methods and subjects

Study Design

This study was a retrospective analytical study & conducted using quantitative & qualitative research methods where an empirical investigation was carried out to determine the impact of Training & other developmental practices on healthcare output as being monitored by hospitals' KPIs through applying the TQM strategy. A quantitative method was chosen to uniformly compare test vs control hospitals' KPIs depending on a unified data collection sheet. In-depth interviews were conducted to investigate challenges & obstacles facing quality team members to implement TQM.

Study sample

The study sample was non-randomized purposeful sample & had been chosen from certain hospitals according to data generated from the quality department at MOH. The study was conducted at 35 hospitals; equally representing the five different MOH's sectors (health insurance hosp., curative institution hosp., specialized centers hosp., general hosp. & educational hosp.) in Egypt (seven hospitals from each sector).

Study population

164 responders were involved in the current study as follows: Four persons were involved from each hospital (hospital managers, quality officers, and training officer & infection control officers) with a total number of 140 responders. Senior-level managers from HRD & quality departments of the MOH-central office were also included in this study with a total number of 24 employees. The response rate was 98.5% of the total questionnaires distributed.

Study Instrument

- a. A structured questionnaire, the ultimate goal of those questionnaires was to: collect data regarding responders' history of exposures to training &/ or formal education in the field of quality in healthcare.
- b. In-depth interviews were conducted to identify the most common obstacles for learning transfer as well as to detect the main challenges facing healthcare professionals to apply TQM at MOH hospitals.
- c. Data collection form: The Most commonly used 16 Key

performance indicators had been collected from 35 hospitals over 6 years period (2009 to 2014)

Statistical analysis

Pre-coded data were entered into the Statistical Package of Social Science Software program, version 21 (SPSS) to be statistically analyzed. Data were summarized using mean, standard deviation, and median for quantitative variables and frequency or percentage for qualitative ones. Comparison between groups was performed using Mann Whitney or Kruskal Wallis tests for quantitative variables. Spearman correlation coefficients were calculated to signify the association between the different quantitative variables. P values less than or equal to 0.10 were considered statistically reasonably significant. Graphs were used to illustrate some information.

Study finding & results

General characteristics of participants

- i. The general demographic characteristics / Distribution data of study participants were as follows:

About 52.5% of participants were males, whereas about 47.5% were females. The educational level of participants ranged from secondary nursing school (2.5%), Ph.D. (10.5. %), and the highest percentage (26.5%) was among participants with a master's degree. Experience years of participants ranged from 1-5 years (59.9%), 6-10 years (29.6%), 11-15 years (1.9%), 15 years (8.6%). According to the profession of participants, there was Quality General manager 3.9%, Quality Department manger 3.0%, Capacity Building General manger 4.3%, Capacity Building Department manager 3.9%, Hospital manager 14.1%, deputy hospital manager 7.4%, Hospital Quality manager 17.2%, Quality officers 9.8%, Hospital Infection control team leader 11.1%, Infection control officers 9.8%, Hospital Training manager 14.1%, Training officers 6.7% .

- ii. Educational characteristics / distribution data of the study participants are illustrated below in (Table 1).

Results of testing hypothesis

Results of the quantitative data analysis: The main hypothesis (H1): is supposing that there is an impact of training & developmental practices on the application of TQM, as evaluated by hospitals' key performance indicators, at the MOH hospitals in Egypt.

However, under the current study circumstance, there was no impact of the different forms of capacity building activities on most of the MOH hospitals' 16- KPIs (p values > 0.1) & no significant difference between KPIs of the test & control group of hospitals except in bed occupancy rate (p value= 0.1), bed turn over (p value= 0.01), as being illustrated in (Table 2).

Results of the descriptive data analysis: The descriptive study findings identified that lack of resources, motivation & leadership support were the most common obstacles for learning transfer. Also, employees resistant to change were the main challenge facing healthcare professionals to apply TQM at MOH hospitals as being expressed by the study-responders. The current study also revealed that a lack of knowledge regarding evaluation methodology & its importance to decision making prevents training professionals from conducting training evaluation.

Table 1 Educational characteristics /distribution data of the study participants

Responders' professional	Quality training		Quality certification		Management training	
	+ve	-ve	+ve	-ve	+ve	-ve
Senior level training mangers	53%	47%	8%	92%	76%	24%
Senior level quality managers	90%	10%	100%	0%	63%	37%
Hospital managers/deputy	65%	35%	18%	82%	82%	18%
Quality managers/officers	86%	14%	35%	65%	52%	48%
Infection-control managers /officers	65%	35%	12%	82%	35%	65%
Training managers /officers	42%	58%	17%	87%	58%	42%

Table 2 The impact of capacity building activities on the score of the 16 KPIs employed at the Egyptian MOH

KPIs	Training/developmental practices						P value
	Test*(n=15)			Control*(n=20)			
	Mean	SD	Median	Mean	SD	Median	
Inpatient volume % change	9.2	41.6	5.5	21.8	43.9	13.0	0.6
Outpatient volume % change	1.3	23.3	-2.3	3.4	63.9	-6.4	0.6
In /out ratio	19.8	12.8	21.4	23.5	26.2	15.6	0.8
24hrs Mortality	0.9	1.0	0.6	1.6	2.0	0.7	0.7
ICU mortality	15.9	9	17.1	16.1	9.9	17.8	0.9
NICU mortality	9.5	6.5	7.7	9.5	8.1	10.9	1.0
Gross Mortality (overall)	2.0	2.1	1.2	1.5	1.7	0.9	0.5
HAIs	0.8	0.8	0.6	0.9	0.7	0.7	0.8
Surgical AIs	0.7	0.9	0.4	0.6	1.0	0.0	0.3
Readmission (inpatient)	2.5	3.2	1.5	1.7	1.7	1.4	0.7
Readmission (Emergency)	4.0	5.5	2.4	1.3	1.5	0.7	0.4
ALOS	5.4	3.8	4.6	4.4	1.5	4.3	0.9
Bed Occupancy rate (In-patients))	54.7	15.8	54.3	68	22.9	77.2	0.1
Bed Occupancy rate (ICU)	72.5	17.9	77.9	74.3	22.8	79.2	0.5
Bed turn over (In-patients)	4.7	1.2	5.1	4.5	2.6	4.4	0.5
Bed turn over (ICU)	5.6	1.2	5.7	4.0	2.1	4.2	0.01

Discussion

This study was purposed to find out the impact of training & other forms of the capacity building onto the application of TQM principles as being reflected via the overall hospital KPIs in the MOH hospitals in Egypt. Several studies had discussed this concept; based upon the assumption that training for quality improvement makes a difference. However there is evidence indicated that training can influence participants' knowledge and confidence, but most studies have not explored whether training directly results in positive outcomes for service users, care quality, or resource use.

Training and development have been recognized as essential to the implementation of TQM. One of Deming's, et al.,1986,¹² 14 points was that all employees must be trained in quality improvement techniques. Organizations committed to TQM invest in training believed that training is vital to the internal diffusion of quality ideas and practices, as without it there is no solid foundation for applying for the formal quality program. TQM training is not a single effort, but should be conducted continuously.¹⁵⁻¹⁸ Other studies¹⁹ comparing professionals who took part in quality improvement training and those who did not have, also found no differences in skills and outcomes.

Another systematic review of postgraduate training programs identified 39 studies with a comparative design, randomized trials were more likely to have mixed or null effects. The implication is that we cannot automatically assume that training has positive effects on quality.²⁰

A randomized trial with 47 rural and small community hospitals in the US compared quality improvement education to a control group. There were no significant differences in processes or clinical outcomes between hospitals that took part and those that did not.²¹

On the other hand more & more of the recent studies are emerging suggesting that training in quality improvement can be beneficial. But a small number of studies suggest that training is associated with improvements in clinical outcomes and direct benefits for service users or care systems, though examination of these types of impacts is rare.^{22,23}

Conclusion

Health care professionals' training & other forms of capacity building activities in the field of TQM at MOH hospitals in Egypt have so far no significant impact on improving the overall hospital quality performance as being monitored by KPIs.²⁴⁻³¹ The latter being a multifactorial entity may add greater complexity to the whole quality performance context.

Study recommendations

- i. Capacity-building activities must not be implemented as a solo event rather they should be preceded by needs assessment & must be followed by an impact assessment.
- ii. TQM training and education differ from other training and education, to obtain the TQM objective of continuous improvement, TQM training, and education must be an unending and continuous process.
- iii. MOH strategic training plan must be designed according to the well-identified / estimated needs assessment from both employees' side & MOH overall strategic plan. This strategic training plan must be shared & communicated by the concerned stakeholders.
- iv. Creation of a quality culture & changing employee attitudes are necessary prerequisites for achieving the objectives of TQM (quality is not just paperwork; it is a persistent life concept concerning both the internal & external stakeholders' satisfaction).
- v. TQM will only be successful if all employers, including top management and other managers, are thoroughly educated in all aspects of total quality to impose all the Principles of TQM in all aspects of the healthcare organization; whereby a very strong commitment from the senior management to empower middle-level managers.
- vi. Standardized customizable quality system must be affected to prevent diversification of quality implementation between the different hospitals affiliated to the 5 different MOH sectors.
- vii. Unification of the monitored indicators in the hospitals affiliated to the 5 different MOH sectors assures the consistency of TQM outputs.
- viii. Further studies /research are still needed to investigate /correlate the relation between HRD & performance improvement.

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Conflicts of interest

The authors declare that there was no conflict of interest.

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