JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH
ISSN: 2576-0017
2023, VOL 6, NO S3

The Impact of Digital Training and Simulation on the Quality of Health Service: Applied to Children's Hospital in Taif City

2024

Amal Saleh Al-Yami[1], Sultan Abdul Ali Marwan Al-Thabeti[2], Mohammed Saleh Saeed Al-Ghamdi[3], Abdullah Hamid Mohammed Al-Sharif[4,] Mahdi Muid Maqad Al-Baqmi[5], Khaled Mutawaq Misfir Al-Qurashi[6], Safra Suhail Al-Qathami[7]

1. Senior specialist in health services and hospital management
2. specialist in health services and hospital management
3. specialist in health services and hospital management
4. specialist in health services and hospital management
5. specialist in health services and hospital management
6. Patient experience management
7. specialist in health services and hospital management

Abstract
This study highlights the effectiveness of combining various tanning methods such as Digital training and simulation in improving the quality of health service, through evaluating the impact of digital training and simulation on the quality of health service. A descriptive survey design was adopts. A sample of (278) respondents, of Children's hospital staff in Taif city were selected by simple random sampling, estimated using the Geiger equation. Structural Equation Modeling (SEM) using the AMOS program (Analysis of Moment Structural) show that Simulation-based training and Digital training, both has positive and significant effects on the quality of health service.
Key words: Digital training - Simulation - Quality of health Service- Children's Hospital - Taif City

Introduction

Continuous quality improvement in health systems has become one of the priorities of health policies. Implementation requires organizational knowledge and the participation of the different agents involved. The new definition of clinical governance aims to ensure high quality care for patients based on best practices, transparency, continuing inter-professional education and a commitment to professional responsibility (Pérez & Lacruz, 2018).

Health service quality is a set of policies and procedures designed to provide health care services to beneficiaries in a systematic and objective manner that contributes to providing opportunities to improve beneficiary care and solve incidental problems in scientific ways through employees in health institutions who use their skills, experience and health care technologies available to them. In order to ensure the achievement of the best results in a timely manner and at the lowest possible cost, this means that the quality of health service is a method for studying the processes of providing health care services and improving them continuously to meet the needs of beneficiaries (Melo, 2018).

Service quality is regarded as a critical success factor of service organizations. This is due to the belief that service quality can deliver positive effects to internal customers (i.e. the organizations' employees) and external customers, the people outside the organization who receive their services. (Kim et al., 2012)

Ramayah et al. (2011) found employees feel satisfaction with their job when they provide good service to the organization's customers. Successfully providing a quality service also can decrease employee's intention to quit the organization (Slatten et al., 2011). In regard to external customers, researchers have found excellent service quality can subsequently increase customers' positive perceptions toward the organization, influences the customers' behavior to continuously receive service from the service organization, and remain loyal to it (Kim et al., 2012).

Health organizations are considered the most sensitive institutions to quality due to their interest in providing services related to human health, so they are in constant search for factors related to the quality of health services and work to achieve them (Al-Dawoud, et.al, 2020).

In-service training has attracted the attention of health organizations because it is the basis that achieves continuous development for workers in a way that ensures that they carry out their tasks, responsibilities and duties in a manner that is consistent with developments that did not exist before, raising the level of efficiency to reach the ability to perform work, ensuring the quality of work and reducing the time to implement it.

The success of the training process depends on the availability of a clear and accurate concept of training among the parties to the training process, and following modern methods in the training process that meet the needs of human resources and develop their knowledge and skills. (Anwar, 2021)

Training is considered to be one important and essential factor that contributes to service quality. As Mosahab et al. (2011, p. 93) indicate, "in order to enhance service quality, training is an important task that cannot be neglected". The training provides an opportunity for employees to continuously learn. This opportunity allows employees to directly upgrade their knowledge, skills, abilities and professionalism which they require to meet the needs of customers, and respond better to customers' requirements (Chand, 2010). Training also leads to the development of an employee commitment to service quality (Sun et al., 2012)

Digital training offers a platform for employees to improve their skills and abilities, while providing new opportunities for learning and performance enhancement (Kirimi &Maende, 2019). It also plays key role in the enhancing employee knowledge, skills and abilities, through considering individuals differences, and presenting type of training that saves the time and efforts (Shen, & Tang, 2018; Grund, &Titz, 2021).

Simulation in healthcare can be broadly defined as a 'tool, device, and/or environment (that) mimics an aspect of clinical cares (Cook, et al, 2011). It has a long history in healthcare education, valued for its ability to repro duce some of the conditions of clinical practice and enable learners to practice in a safe environment.

More recently, it has been used as a technique for supporting improvement in healthcare systems and processes, for example, by helping to diagnose problems or test new approaches before they are deployed for real (Cheng, et.al, 2015 ; Slakey, et al, 2014). Given this history, most recent research is about simulation focusing on its effectiveness in achieving training or practice goals.4 Despite some recent encouraging examples,the potential of simulation on conducting the continues training has remained under exploited (Cheng, et al, 2018).

Simulation is a learning tool that supports development through experiential learning by creating or replicating a particular set of conditions which resemble real life situations; it should provide a safe environment where participants can learn from their mistakes without any danger to patients, allowing individuals to analyze and respond to these realistic situations, with the aim of developing or enhancing their knowledge, skills, behaviors and attitudes (Anderson, 2022).

According to (McGaghie, et.al, 2011) Simulation-based education and training has a crucial role in improving the quality and safety of care for patients; Simulation not only provides opportune ties for training and debriefing on safety behaviors, but can also play a significant role in improving quality of healthcare systems.

Problem Statement

Despite the unlimited support and attention given by the Ministry of Health in the Kingdom of Saudi Arabia and its affiliated sectors to provide high-quality health services, there are still shortcomings in this regard (Anwar, 2020). Many studies have attributed these shortcomings to training and development aspects, and that those in charge of the training process do not take into account some scientific principles of the process of renewal and development in training activities and methods, in addition to the lack of training programs for spreading the culture of comprehensive quality in health services.

Some studies have confirmed that training has a close relationship with the quality of health services (Hohou, 2019; Musa, 2019) and that the quality of training is positively reflected in the quality of health services provided. These studies have confirmed that training content and training methods play a major role in influencing the quality of health services.

Studies by (Al-Dawoud, 2020: Al-Maimouni and Al-Mutairi, 2021) have also shown that the training methods common in most health organizations, despite their diversity, are not updated, as the training programs in these organizations do not rely on the Digital training or simulation training, except in a narrow scope and not for the purpose of improving the quality of health services.

Despite the large number of previous studies that addressed the impact of training on the quality of health services, there is a scarcity of studies that addressed the impact of a specific type or method of training on the quality of service in health organizations in the Kingdom of Saudi Arabia directly. Therefore, this study comes as an attempt to bridge this research gap and study the impact of digital training and Simulation-based training on the quality of health service at the children's hospital in Taif city.

Research Objectives

This research aims primarily to verify the impact of digital training and simulation on the quality of health serviceat the Children's hospital in Taif city, by achieving the following sub-objectives:

1. To investigate the effect of Digital training programs on the quality of health service at the Children's hospital in Taif city.
2. To investigate the Simulation-based training on the quality of health service at the Children's hospital in Taif city.

Research questions

1. What is the impact of digital training on the quality of health service at the Children's hospital in Taif city?
2. What is the impact of Simulation-based training on the quality of health service at the Children's hospital in Taif city?

Significant of the Research

The significant of this research comes from the importance of the health sector, especially hospitals where medical staff are trained and prepared in various categories (doctors, nurses, technicians and laboratory technicians). This does not mean that training is limited to students in medical and nursing colleges, etc., but rather training must continue in all stages of medical work, which is called continuous medical learning. On the other hand, this research provides a theoretical framework that represents a scientific and cognitive addition regarding the research variables, especially with the scarcity of literature related to the use of digital training and Simulation-based training and their impact on the quality of Health Service in the Saudi health sector. The researchershopes that this research will provide a set of recommendations that decision-makers in the health sector in general and the Children's hospital in Taif city in particular can use as a guide in activating the digital training and Simulation-based training and applying them in the best ways to achieve the quality of Health Service.

Limitations

Due to time and resource constraints, the time frame of this research was limited to the year (2024), and the objective scope was limited to investigating the nature and trend of the impact of digital training and simulation on the quality of health service. Data were collected from Children's hospital staff in Taif city in the health sector in the Kingdom of Saudi Arabia.

Methodology

The aim of this research was to evaluate the impact of digital training and simulation on the quality of health service. This study adopts a descriptive survey design. The area of the research was based on Children's hospital in Taif city. The researchers utilized a quantitative research technique for conducting the research study. The essential data was gotten with the help of questionnaires that were circulated among the staff of Children's hospital staff in Taif city in KSA.

Population and Sample

The research population includes the entire staff of the Children's hospital in Taif city, which consists of (doctors, nurses, technicians, laboratory technicians, and administrators). A sample of (278) respondents, were selected by simple random sampling, estimated using the Geiger equation. And included that comprises of both male and female of Children's hospital staff in Taif city.

Questionnaire Development

The questionnaire comprises of two sections the first section contains personal questions regarding sexual orientation, age, and education, experience, & income. These questions are hoped to get background information about the participants that would support in descriptive statistics in the analysis part. The second section contains questions regarding the research variables. The questions used to obtain responses on a five-point Likert scale. The points varied from "1" meaning "strongly disagree" to "5" meaning "strongly agree". All the questions in the questionnaire are close-ended.

The Digital training scale was taken from Salah (2020) and Anwar (2018). The scale of Simulation-based training was obtained from the research study of Shaimaa, et.al. (2012), and the scale of Quality of Health Service was obtained from Hamed et.al. (2021)

Data Analysis Method

The variables used in this study are Digital training (ET); Simulation-based training (V); and (QHS) quality of health service. The inferential statistical method used in the data analysis is Structural Equation Modeling (SEM) using the AMOS program (Analysis of Moment Structural). The structural equation is formulated to state causality relations of inter-latent variables.

RESULT AND DISCUSSION

The structural model shown in Figure (1) shows the hypotheses formulated. Before moving on to the structural model analysis it is necessary to understands the structural model path diagram.

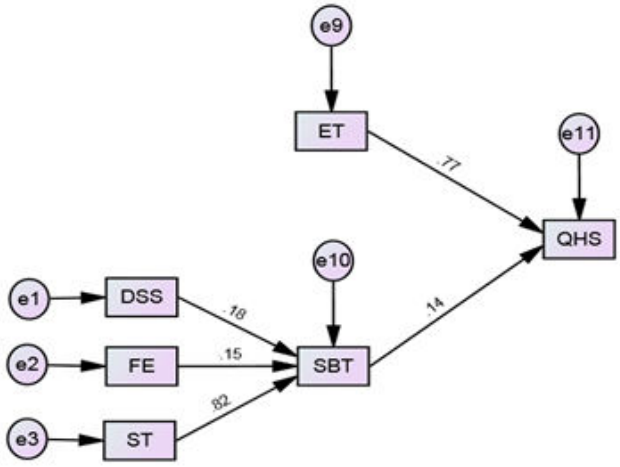

Figure (1) Default model Path standardized estimates values

In reviewing the model presented in figure (1) it can be seen that there are (3) Observed, endogenous variables (ET, SBT, QHS) and (6) Unobserved, exogenous variables (e1, e2, e3, e9, e10, e11).

In order to test proposed model (IBM\SPSS\Amos\v26) was utilized, which is a form of structural equation modeling (SEM) as it is appropriate for multivariate models analysis as it is able to model relationships among multiple predictors and multiple criterion variables. Results are presented below, and include path coefficients and their statistical significance, that can be observed in Figure (2).

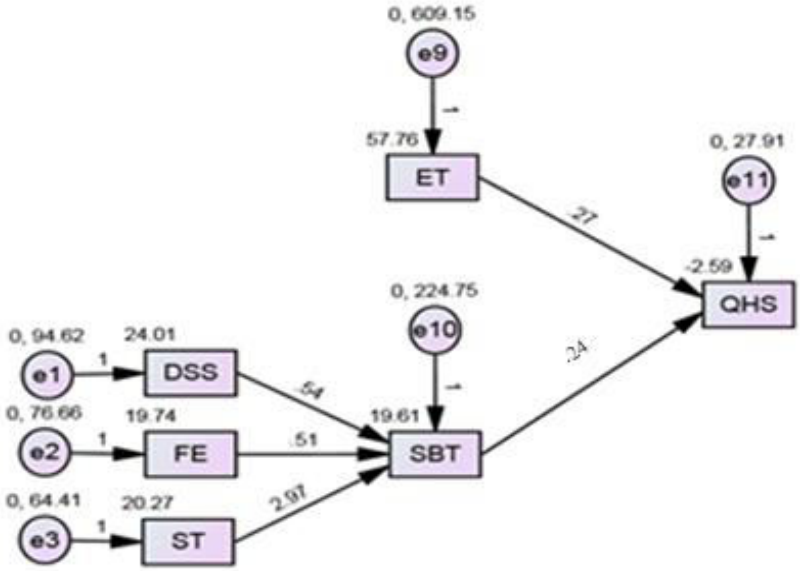

Figure (2) Default model Path Unstandardized estimates values

Results show that the model conformity test criteria is done by comparing the cut-off value of the goodness of fit index obtained from the results of the existing pre-existing model estimation that meets the expected criteria. Model feasibility testing is started by evaluating whether parameter deviations are estimated based on the maximum likelihood method by looking at: (1) the negative error variance value or the variant error significance in the constructed construct; (2) The standardized exceeding or very close to 1. (3) Very large standard errors associated with any estimated coefficient. The structural model is said to be in accordance with observation data if the Chi-square is small and insignificant at $\alpha = 0.05$; probability value $\geq 0,05$; CMI/DF $\leq 2,00$; GFI, AGFI, NFI and CFI $\geq 0,90$; and RMSEA $\leq 0,80$

Table (3) AMOS Output Showing Model Fit

Model	x^2	P	CMI/DF	GFI	AGFI	NFI	CFI	RMSEA
Default model	118.696	0.00	1.5415	.839	.708	.991	.939	.044
Saturated model	0			1.000		1.000	1.000	
Independence model	658.891	0.00	43.926	.551	.449	.000	.651	.167

As shown In table (3) there are eight criteria of the goodness of fit of structuralmodel index that is built to estimate the parameters accordingto the observational data, there are six criteria models thathave met the cut-off point so that the built structural model inthis study can be accepted even with various limitations according to the observational data indicated by the Chi-squarevalue (x^2) = 118.696 with probability of (0.00). Then RMSEA = (0.044).And CFI, NFI, CMI / DF values are all above the required cut-off value as a fit structural model. While GFI value(0.839)and AGFI value (0.708) are still below the requiredboundary number in the structural model, which is ≥ 0.90 .

Based on inter-latent variable relations in Figure (2), it can be seen magnitude of each exogenous variable effect on endogenous variables. Results of processed research data show that all tow direct relationships built in this research have been positive relationships, as shown in table (4)

Table (4) Standardized regression weights inter-Latent Variables effects

Latent Variables			Effect Coefficient	Prob	Notes
SBT	--->	QHS	0.144	0.005	significant
ET	--->	QHS	0.773	0.000	significant

Source: processing results with AMOS software version (26)

Based on the results of estimated regression standardweights, it can be seen the effect coefficient value and theprobability level of each direct latent variables. Table (4) show that there are two direct relationships, namely: (1) Simulation-based training has positive and significant effects on the quality of health service (2) Digital training has positive and significant effectson the quality of health service.

Results of structural model conformity analysis are built as a basis for analyzing the inter-latent variable relations and hypothesis testing through standardized regression weight value with the aim of knowing the hypothesized inter-latent variable relations and the significance level of relationships presented in Table (4).

The test results of standardized direct effects, indirect effects and total effects of inter-latent variables in this research are presented in Table (5)

Table (5) Standardized Direct- Indirect and total effects of inter- Latent Variables

Latent Variables	Direct effect	Indirect effect	Total effects	Notes
SBT	0.144	0.000	0.144	significant
ET	0.773	0.000	0.773	significant

Source: processing results with AMOS software version (26)

Result in table (5) confirming that Simulation-based training plays a role in improving the quality of health service, which can be seen from the standardized total effect estimate of 0.144 (0.144 + 0.144 = 0.144), meaning that when SBT goes up by 1 standard deviation, QHS goes up by 0.144 standard deviations.

It also confirms that Digital training plays a role in improving the quality of health service, with standardized total effect estimate of 0.773 (0.773 + 0.00 = 0.773), meaning when ET goes up by 1 standard deviation, QHS goes up by 0.773 standard deviations.

This implies that trend of changes in HR training methods has positive effects on patient satisfaction because of the role of good service quality.

CONCLUSION

Based on research analysis results and discussion on Digital training and Simulation-based training effects on the quality of health service at The Children's hospital in Taif city, it is obtained the following conclusion:

Digital training has positive and significant effects on the quality of health services at The Children's hospital in Taif city. This fact shows that training consisting of training materials, training methods, trainers (instructors), training participants, supporting facilities for training evaluation so that it can improve the quality of services at The Children's hospital in Taif city. This fact shows that Training offers a platform for employees to improve their skills and abilities, while providing new opportunities for learning and performance enhancementAccording to (Kirimi &Maende, 2019 ; Al-Refaei, 2021). The relationship between training and service quality can be explained through the social exchange

theory. When training perceived as a gift from organization to develop employee's knowledge and skills, then employees reciprocate that to the organization by increasing their efforts and providing superior service quality.

Simulation-based training has positive and significant effects on the quality of health services at The Children's hospital in Taif city. This fact shows that Simulation has broad applications in both clinical educational and QI contexts, providing healthcare professionals with opportunities for education and clinical enhancement. This progress extends to diagnostic and testing domains, fostering improvements in healthcare quality through experimentation with new devices, techniques and process optimization.

Despite encouraging evidence in this context, simulation is believed to be underused as it can effectively integrate into traditional curricula.

References

Al-Dawoud, Wafaa Hussein Ahmed, and Abdul Muttalib, Muhammad Muhdar, (2020), The impact of training for human resources in improving the quality of health services: A case study of King Abdullah University Hospital in the Hashemite Kingdom of Jordan, Journal of Sharia Research and Studies, Vol. 9, No. 96, 215-240, http://search.mandumah.com/Record/1069913.

Anderson A, IHI, (2022), psychology of change framework to advance andsustain, Hawker C, Jones B, Cook SC, Mitra S, Hoole A, Bartholomew B ,Diaz-Navarro C. Developing an All-Wales definition of simulation-basededucation. Int. J Healthcare Simulation; 2(1): A40–1.

Anwar N. A. A. L, (2021), The role of training in improving the quality of health services in teaching hospitals, an applied study on the Republic Teaching Hospital in Aden Governorate, Albaydha University Journal, 2(3), 1–20. https://doi.org/10.56807/buj.v2i3.98

Chand, M. (2010), The impact of HRM practices on service quality, customer satisfaction andperformance in the Indian hotel industry", International Journal of Human ResourceManagement, Vol. 21 No. 4, pp. 551-566.

Chand, M. (2010), The impact of HRM practices on service quality, customer satisfaction andperformance in the Indian hotel industry, International Journal of Human ResourceManagement, Vol. 21 No. 4, pp. 551-566.

Cheng A, Auerbach M, Calhoun A, et al. (2018), Building a community of practice for researchers: the international network for simulation- based pediatric innovation, research and education. Simulation Healthcare; 13:S28–34.

Cheng A, Grant V, Auerbach M. (2015), Using simulation to improve patient safety: dawn of a new era, JAMA Pediatr; 169:419.

Cook DA, Hatala R, Brydges R, et al. (2011), Technology- enhanced simulation for health professions education: a systematic review and meta- analysis, JAMA; 306 :978–88.

Grund, C& ,.Titz, K. (2021), Affective commitment through further training: the roles of firm provision and employee participation. Review of Managerial Science, 1-32.

Houhou, Muhammad Al-Sadiq (2019) The role of training in improving the quality of health services, a case study of the Public Institution for Neighborhood Health in Biskra, Algeria, Faculty of Economics, Business and Management Sciences (FSECSG), Economic Journal of Management Sciences, Vol. 8, No. 3.

Kim, Y., Kim, S., Myoung, H. and Lee, H.R. (2012),Perceived service quality and its influence onbehavioral intention in South Korean public dental hospitals, Asia-Pacific Journal of PublicHealth, Vol. 24 No. 2, pp. 391-405.

Kirimi, R. N& ,.Maende, C, (2019), Training and Development Techniques and EmployeePerformance in the Ministry of Labour and Social Protection, Nairobi City County, Kenya,International Journal of Current Aspects, 3(II), 131-144.

McGaghie WC, Draycott TJ, Dunn WF, Lopez CM, Stefanidis D. (2011), Evaluating the impact of simulation on translational patient outcomes. Int. J Healthcare Simulation; 6(7):S42–7.

Melo, S. (2018). The role of place on healthcare quality improvement: A qualitative case study of a teaching hospital. Social Science & Medicine, 202, 136-142.

Mosahab, R., Mahamad, O. and Ramayah, T. (2011), Motivational orientation as an internalmarketing tool in service training: a study of service delivery in a hospital, InternationalJournal of Business and Management, Vol. 6 No. 2, pp. 93-100.

Mosahab, R., Mahamad, O. and Ramayah, T. (2011), Motivational orientation as an internalmarketing tool in service training: a study of service delivery in a hospital, InternationalJournal of Business and Management, Vol. 6 No. 2, pp. 93-100.

Pérez, María Luisa Gracía& Lacruz, Marta Gil, (2018), The impact of a continuing training program on the perceived improvement in quality of health care delivered by health care professionals. Evaluation and Program Planning Journal, volume(66), 33-38. https://doi.org/10.1016/j.evalprogplan.2017.09.009.

Ramayah, T., Samat, N. and Lo, M.C. (2011), Market orientation, service quality andorganizational performance in service organizations in Malaysia, Asia-Pacific Journal ofBusiness Administration, Vol. 3 No. 1, pp. 1-21.

Shen, J& ,.Tang, C, (2018), How does training improve customer service quality?, The roles of transfer of training and job satisfaction, European management journal, 36(6), 708-716.

Slakey DP, Simms ER, Rennie KV, et al. (2014), Using simulation to improve root cause analysis of adverse surgical outcomes, Int. J. Qual Health Care; 26:144–50.

Slatten, T., Svensson, G. and Svaeri, S. (2011),Service quality and turnover intentions asperceived by employees: antecedents and consequences, Journal of Personnel Review ,Vol. 40 No. 2, pp. 205-221.

Sun, P.C., Hsu, W.J. and Wang, K.C. (2012), Enhancing the commitment to service quality throughdevelopmental and rewarding systems: CSQ consistency as a moderator, InternationalJournal of Human Resource Management, Vol. 23 No. 7, pp. 1462-1480.