

Interplay of Total Quality Management, Employee Reporting and Hospital Planning for Enhanced Patient Safety

Maher El Cheikh*, Maher Ghazal

Faculty of Business Administration, Jinan University, Tripoli, Lebanon. *Corresponding Author's Email: maheralcheikh1979@gmail.com

Abstract

This paper examines the interplay of total quality management, the reporting process, the planning practices and patient safety development at Dr. Abdullah Al-Rassi Governmental Hospital in Akkar and Al-Minieh Governmental Hospital in North Lebanon. The originality of this paper is the first investigating of Quality Management, Reporting, Planning and Patient Safety at hospitals in Lebanon. Additional research should be investigated on quality management for patient care in hospitals. This paper aims to examine best applications of reporting and planning process for the patient protection. A descriptive method and quantitative approach were applied. A sample size of 550 respondents was selected 480 respondents from Dr. Abdullah Al Rassi Governmental hospital and 70 respondents from AL-Minieh Governmental Hospital. SPSS version 26 software, SPSS Andrew F. Hayes Model 6 and Confirmatory factor analysis by AMOS Software were applied in analyzing data. The results define that determinant is equal to 0.001, KMO is equal to 0.886 that are acceptable. Approx chi-square is equal to 3751.2. The model factor of the communalities output is providing acceptable results. All questions are examined in the reliability test Cronbach's alpha are providing equal to 0.856. The correlation interpretations of the variables are providing a Sig lower than 0.05. The confirmatory factor analysis, Regression weights of variables and elements interpretations are fitting the results. Employee Reporting has a Positive Impact on Total Quality Management Partially Mediated by Hospital Planning. Employee Reporting has a Positive Impact on Hospital Planning Partially Mediated by Patient Safety.

Keywords: Employee Reporting, Hospital Planning, Patient Safety, Total Quality Management.

Introduction

In Lebanon, health care sector is on a daily improvement in increasing more than 5% yearly from the year 2023. The management process is developing new evolutions regarding hospital plans, rules and innovation practices related to patients (1). Hospitals characteristics including total quality management are a deep evaluation process for the patient before choosing one hospital. Patients are seeking for health care satisfaction and take their decision related to hospital health quality (2). In North Lebanon, hospitals applied total quality management by collecting suitable information and analyzing data to provide solutions for the patients (3). In Lebanon, the quality process of public health hospitals is measured effectively for the health care practices applied by the employees in a daily routine work (4). Lebanese private and public hospitals were facing lot of challenges in healthcare management practices due to the lack of patient knowledge and satisfaction (5). The innovation model of providing solutions of the

medical sector will deliver an improvement on the Total Quality Management in the Lebanese hospitals (6). Total quality management is an innovative approach providing new methods for the development of the organization through the training and education of the employees (7). The measurement of the total quality management focuses on the development of the organization (8). Reaching innovative performance is defined by applying creative ideas, it will lead to good total quality management in the organization (9). Total quality management measurements defined that empowerment is directly related to the performance (10). The Employee reporting is a written and prepared content of the case leading to the enhancement of the quality of the health care services (11). Good reporting enabled employees to provide suitable planning for the organization (12). Techniques applied in employees reporting had a direct role in the development of the management system to improve the outputs of the organization (13). Reporting of the current

This is an Open Access article distributed under the terms of the Creative Commons Attribution CC BY license (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted reuse, distribution and reproduction in any medium, provided the original work is properly cited.

(Received 20th February 2026; Accepted 25th August 2026; Published 04th October 2026)

business situation has an important role in enhancing the patient satisfaction in health care services (14). Organization should strongly stress on accountability and reporting in order to increase performance (15).

Hospital planning behavior is a clever tool that has a direct effect on the performance and total quality management of the organization (16). Planning is taken as an initial business activity that led to suitable total quality management (17). Decision making is a support process and analytical tool that led to good planning practices (18). Planning helps employees to practice the duties through the management steps of the organization (19). In planning, organization should study the strength and weaknesses of the business in order to provide best service (20).

Patient Safety is a vital strategy that is evaluated through the feedback, low medication error, experience, low infection, safety environment, complaint and two side communications (21). Patient safety is a managerial skill of the health care activity that increase hospital planning to reach patient satisfaction (22). Patient safety is related to the quality of health care and the management process (23). Patient safety is a goal strategy providing more attention on the hospital in order to improve the patient satisfaction (24). Patient safety is a continuous improvement culture that is directly related to the two-way communication and well supervision action made by the employees (25). The paper problems are defined that the system in some hospitals provide irregular data about patients including care, experience and health results (26). From over two decades, Lebanese hospitals faced economic distress related to health care system, planning development and quality management (27). Since 2019, Lebanese hospitals are facing high decrease in the Lebanese lira against the international currencies that directly decrease the purchasing process of the health care instruments, total quality management and patient satisfaction (28). Health care services problems are defined by the positive employees reporting that didn't provide suitable vision for the patient satisfaction and good care process (29). Lebanese healthcare face

troubles in providing quality management, management reporting and patient satisfaction (30).

This paper answers the following questions: what is the Impact of Employee Reporting on Total Quality Management and Hospital Planning? what is the Impact of Employee Reporting on Hospital Planning and Patient Satisfaction?

The originality of this paper is dependent on the study of two hospital in Akkar, Lebanon. It is the first research that examined four variables for hospital practices: Total Quality Management, Employee Reporting, Hospital Planning and Patient Safety. Previous studies didn't interpret the mediator variable in the planning process in the hospitals in Lebanon. It is the first article that apply the combination of SPSS andree Hayes for mediator and AMOS interpretation for the safety of patients and total quality management in the hospitals in Lebanon.

Research gaps seek more studies should be applied on total quality management in the hospitals in North Lebanon (3). More improvement should be applied for the safety of patients and health care planning in the Lebanese hospitals (31). Decision making and reporting in health care Lebanese sector should be enhanced in order to provide more quality (32). Governance and planning process should be more studied in the future to enhance Lebanese hospital system (33).

The purpose of this paper is to investigate the best practices of quality management and patient safety. This paper is organized as follows: first part defines the methodology; second part interprets the results; third part examines the discussion and conclusion.

The research has examined two hypotheses they are defined as follows:

H1: Employee Reporting has a Positive Impact on Total Quality Management Partially Mediated by Hospital Planning.

H2: Employee Reporting has a Positive Impact on Hospital Planning Partially Mediated by Patient safety.

As defined in Figure 1, the positive impact of the variables Total Quality Management, Employee Reporting, Hospital Planning, Patient Safety.

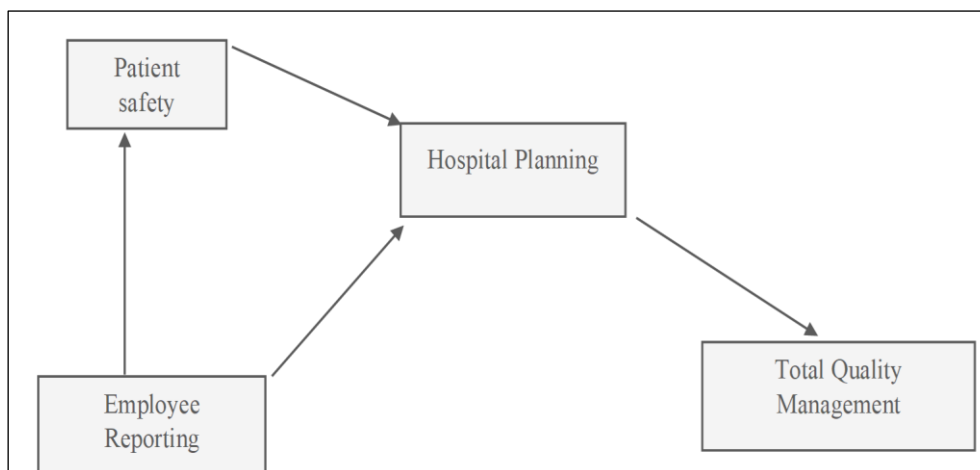


Figure 1: The Positive Impact of Employee Reporting on Total Quality Management Partially Mediated by Hospital Planning and Hospital Planning Partially Mediated by Patient Safety

The paper objective is to fully understand the elements related to the patient safety and employees reporting processes. In addition of that, the vital practices related to total quality management and planning development of the two hospitals in Akkar, Lebanon.

Methodology

Research Design

The research design is applied as follows: the first phase including the model and the hypotheses process through defining the variables independent, the mediator and the dependent variable. The second phase is the instrument usage of the Likert scale related to the literature reviews interpreted. The third phase is the collection of data of the questionnaire physically to anonymous respondent through printed questionnaire during November 2025. The fourth phase is the factor analysis, reliability study, correlation through SPSS. The fifth phase is the regression Andree Hayes for mediator and Confirmatory Factor Analysis through AMOS

Population and Techniques

Interpreted

An examination about total quality management, employee reporting, hospital planning and patient safety was conducted by the researcher with the employees of two hospitals in Akkar, Lebanon. The Population has a total of 600 respondents that is distributed about 510 respondents from Dr. Abdullah Al-Rassi Governmental Hospital (GPS: 34°32'11.8"N, 36°05'20.7"E), Aadbel in Akkar and 90 respondents from Al-Minie Governmental Hospital (GPS: 34.472282,35.915295) in North

Lebanon. The sample has a total of 550 respondents and divided of 480 respondents from Dr. Abdullah Al-Rassi Governmental Hospital in Akkar and 70 from Al-Minie Governmental Hospital in North Lebanon. The difference between the two hospitals is related to the central location of Dr. Abdullah Al-Rassi Governmental Hospital in Akkar between about 20 villages and the minor location of Al-Minie Governmental Hospital in only 5 villages providing the same proportion of the distribution of the number of employees and the patients that not change the interpretation of the data and the results achieved.

Data was collected only during November 2025. The researcher applied a quantitative method and a descriptive research technique in conducting this paper. The Philosophy applies is the Positivism Ontology though investigating the type of Reality and the Epistemology by examining the acquisition of the Knowledge.

Material Resolution

The researcher interpreted the data through applying SPSS version 26, SPSS Andrew f. Hayes model 4 and AMOS software. The data were collected from 550 respondents studied and evaluated to provide results, outcomes and conclusion.

SPSS Application

The researcher analyzed the data through SPSS version 26 by investigating the factor analysis in order to discover the determinant that should be above 0.0001, the Bartlett's test and the KMO should be above 0.05, the sig should be below 0.05 for receiving acceptable results. The communalities results should be above 0.3

defining the percentage of factor model explaining the element interpreted. The Cronbach Alpha reliability test valued the elements and variables internal consistency should result above 0.7 for acceptable outcomes. Correlation examination of the variables resulting should be above 0.5 for good outcomes and sig below 0.5 to reach acceptable evaluation of the relation of the covary linear output. The standard deviations investigate the element distance from the average mean to provide a clear vision about the nature of the data. The mean examines the level of the variable through the average of the results to define the development of each element.

The SPSS Andrew F. Hayes Model 4 for mediator interpretations and the sig should be below 0.5. The confidence interval should not comprise zero in the direct effect and indirect effects of X and Y variables and the mediator is progressive. A partial mediation defined that direct effect is lower than the total effect on the other hand the result provides full mediation.

Confirmatory Factor Analysis by AMOS Software

The researcher applied AMOS 5,000 bootstrap techniques for the investigation of the indirect test. The confirmatory factor analysis investigates the power of the relationship between variables to examine validity and applying structural equation interpretation. Sig should be below 0.5 to provide acceptable result of the correlation between variables. Model summary results included the indexes output that should fit the model to provide suitable relationship between variables. The model summary defined goodness of fit, adjusted fit, degree of freedom root mean square, comparative fit index and normed fit index.

Questionnaire

The questionnaire is distributed to employees working as Technician, X-ray Imaging, Administrative, Nurse, Laboratory, Doctor, Doctors visitors because they are expert in the process applied in the hospital like total quality management and patient satisfaction. The questionnaire is spread physically paper based and entered the SPSS software. The sample of 510 questionnaires were distributed and filled by the respondents. The research questionnaire is divided into 5 sections of 19 questions as shown in Appendix 1. The first section is the demographic section that consist of 3 questions, the second

section is associated to total quality management variable that consist of 4 questions (34), the third section is associated to employee reporting that consist of 4 questions (35), the fourth section is associated to Hospital planning that consist of 4 questions (36) and the fifth section is associated to Patient safety that consist of 4 questions (37). A Likert scale of 5 dimensions is applied in the questionnaire collection and investigation.

Results

The researcher examined the relationship between total quality management, Employee Reporting, Hospital Planning and Patient Safety in two hospitals in Akkar, Lebanon.

Factor Analysis and KMO

Interpretations

The correlation matrix of the elements of the questionnaire is providing a determinant result equal to 0.001 that is over than 0.0001 providing a satisfactory output and adequate correlation between the questions. The Kaiser Meyer Olkin Measurement of the Sample Adequacy the KMO is providing a result equal to 0.886 that is superior to 0.5 that is an acceptable outcome defining the adequacy of the entire questionnaire is suitable to be examined. The sig is equal to 0.000 below 0.05 defining a good result. The Approx chi-square is equal to 3751.2 representing better fit providing a high result and there is correlation between questions.

Communalities Outputs

The model factor of the communalities output is interpreted through the percentages of the 16 questions applied in the communalities factor analysis test. The result of the communalities of the 16 questions is acceptable and they are ranging from 32.4% to 60.9% providing that each portion of the question variance is designated by the factor model of the research.

Reliability Test

All questions are examined in the reliability test Cronbach's alpha for the entire questionnaire of the research paper providing equal of 0.856 for 16 questions defining acceptable result and ensuing an acceptable outcome of the internal level of consistency for the model dimensions investigated. The results of Cronbach's alpha reliability test of the variable Total Quality Management including 4 questions provided an output equal to 0.832 defining an acceptable result

and ensuing an acceptable outcome of the internal level of consistency for the model dimensions investigated. The results of Cronbach's alpha reliability test of the variable employee reporting including 4 questions provided an output equal to 0.858 defining an acceptable result and ensuing an acceptable outcome of the internal level of consistency for the model dimensions investigated. The results of Cronbach's alpha reliability test of the variable hospital planning including 4 questions provided an output equal to 0.770 defining an acceptable result and ensuing an acceptable outcome of the internal level of consistency for the model dimensions investigated. The results of Cronbach's alpha reliability test of the variable patient safety including 4 questions provided an output equal to 0.790 defining an acceptable result and ensuing an acceptable outcome of the internal level of consistency for the model dimensions investigated.

Correlation Variables Interpretations

The correlation interpretations of the variables are defined that the Sig of the variables quality management, reporting, planning and patient safety is below 0.05 providing acceptable results. The exploration of the correlation between variables is defined as follows:

The output of Pearson value is equal to 0.832 with a Sig equal to 0.000 providing a strong relationship between "Total of the variables" with "Total Quality Management".

The output of Pearson value is equal to 0.799 with a Sig equal to 0.000 providing a strong relationship between "Total of the variables" with "Employee Reporting".

The output of Pearson value is equal to 0.692 with a Sig equal to 0.000 providing a strong relationship between "Total of the variables" with "Hospital Planning".

The output of Pearson value is equal to 0.474 with a Sig equal to 0.000 providing a medium

relationship between "Total of the variables" with "Patient Safety".

The output of Pearson value is equal to 0.121 with a Sig equal to 0.004 providing a low effect and a covary linear result between "Total Quality Management" with "Patient Safety".

The output of Pearson value is equal to 0.438 with a Sig equal to 0.000 providing a medium effect and a covary linear result between "Total Quality Management" with "Hospital Planning".

The output of Pearson value is equal to 0.758 with a Sig equal to 0.00 providing a large effect and a covary linear result between "Total Quality Management" with "Employee reporting".

The output of Pearson value is equal to 0.098 with a Sig equal to 0.021 providing a low effect and a covary linear result between "Patient Safety" with "Employee reporting".

The output of Pearson value is equal to 0.356 with a Sig equal to 0.00 providing a medium effect and a covary linear result between "Hospital Planning" with "Employee reporting".

The output of Pearson value is equal to 0.141 with a Sig equal to 0.001 providing a low effect and a covary linear result between "Hospital Planning" with "Patient Safety".

Mediator Interpretation SPSS Andrew F. Hayes Model 4

The interpretation of the relationship of H1 the Employee Reporting has a Positive Impact on Total Quality Management Partially Mediated by Hospital Planning is as follows:

The relationship between the mediator "Hospital Planning" and the independent variable "Employee Reporting". The mediator "Hospital Planning" P value is below 0.05 providing an acceptable result. The confidence interval is acceptable because it didn't include zero (0.2672 – 0.4182). It is defined that each unit increase from the independent variable "Employee Reporting" will enhance the achievement of "the mediator "Hospital Planning" as represent in Equation [1].

$$Y = \text{Constant} + b_1x_1 \quad [1]$$

Where, Y = Hospital Planning, constant = 2.3632, $b_1 = 0.3427$, x_1 = Employee Reporting.

Here, Hospital Planning = $2.3632 + 0.3427$ Employee Reporting

The relationship of the dependent variable "Total Quality Management" including the mediator "Hospital Planning" and the independent variable "Employee Reporting" as a predictor. They have a P value below 0.05 defining an acceptable result.

The confidence intervals are acceptable because they didn't include zero (0.6038 - 0.7113) and (0.1354 - 0.2470).

The mediator "Hospital Planning" has a role on dependent variable "Total Quality Management"

controlling for independent variable “Employee Reporting”.

The independent variable “Employee Reporting” has a direct effect on dependent variable “Total Quality Management” after accounting or removing the mediator.

$$Y = \text{Constant} + b_1x_1 + b_2x_2 \quad [2]$$

Where, Y = Total Quality Management, Constant = 0.6548, $b_1 = 0.6575$, $x_1 = \text{Employee Reporting}$, $b_2 = 0.1912$, $x_2 = \text{Hospital Planning}$.

Total Quality Management = $0.6548 + 0.6575 \text{ Employee Reporting} + 0.1912 \text{ Hospital Planning}$

The indirect effect of the dependent variable “Total Quality Management” on independent variable “Employee Reporting” P value below 0.05 defining an acceptable result. The confidence intervals are acceptable because they didn’t include zero (0.0393 - 0.0963). The results defined that the mediator is significantly acceptable and Hypothesis 1 is acceptable.

The interpretation of the relationship of H2 Employee Reporting has a Positive Impact on

$$Y = \text{Constant} + b_1x \quad [3]$$

Where, Y = Patient safety, constant = 3.3064, $b_1 = 0.0912$, $x_1 = \text{Employee Reporting}$.

Here, Patient safety = $3.3064 + 0.0912 \text{ Employee Reporting}$

The relationship of the dependent variable “Hospital Planning” including the mediator “Patient safety” and the independent variable “Employee Reporting” as a predictor. They have a P value equal to 0.000 and 0.0074 they are below 0.05 defining an acceptable result. The confidence intervals are acceptable because they didn’t include zero (0.2571- 0.4080) and (0.0300 - 0.1925).

The mediator “Patient safety” has a role on dependent variable “Hospital Planning”

$$Y = \text{Constant} + b_1x_1 + b_2x_2 \quad [4]$$

Where, Y = Hospital Planning, constant = 1.9955, $b_1 = 0.3326$, $x_1 = \text{Employee Reporting}$, $b_2 = 0.1112$, $x_2 = \text{Patient safety}$.

Here, Hospital Planning = $1.9955 + 0.3326 \text{ Employee Reporting} + 0.1112 \text{ Patient safety}$

The indirect effect of dependent variable “Hospital Planning” on independent variable “Employee Reporting” P value is equal to 0.000 and 0.0074 they are below 0.05 defining an acceptable result. The confidence intervals are acceptable because they didn’t include zero (0.0002 - 0.0265). The results defined that mediator is significantly acceptable and Hypothesis 2 is acceptable.

It is defined that each unit increase from the independent variable “Employee Reporting” and the mediator “Hospital Planning” will enhance the achievement of the dependent variable “Total Quality Management” as represent in Equation [2].

Hospital Planning Partially Mediated by Patient safety is as follows:

The relationship between the mediator “Patient safety” and the independent variable “Employee Reporting”. The mediator “Patient safety” P value is equal 0.0213 that is below 0.05 providing an acceptable result. The confidence interval is acceptable because it didn’t include zero (0.0136 - 0.1687). It is defined that each unit increase from the independent variable “Employee Reporting” will enhance the achievement of the mediator “Patient safety” as represent in Equation [3].

controlling for independent variable “Employee Reporting”.

The independent variable “Employee Reporting” has a direct effect on dependent variable “Hospital Planning” after accounting or removing the mediator.

It is defined that each unit increase from the independent variable “Employee Reporting” and the mediator “Patient safety” will enhance the achievement of the dependent variable “Hospital Planning”. as represent in Equation [4].

Means and Standard Deviations Results

An examination of the data gathered from the respondents defining the sample size of 550, mean values and standard deviation results of the variables. The investigation of the variables is practiced resulting that the mean of “Total quality management” had the largest mean between variables providing an output of mean equal to

3.88 that is seen as quite acceptable and need to be improved. They need to do more training and education for the employees, management system should be improved by solving the problems detected, enhancing the empowerment of the employees and decrease appointment time of the patients. The means of other variables are seen as quite acceptable and need more improvements they are as follows the “Employee reporting” had a mean equal 3.84. The Employee reporting should provide more effective content, suitable decision making, more specific analyses and best guidance of practices. The “Hospital planning” had a mean equal to 3.68. The Hospital planning needs more development in applying changes, more clear strategy, more engagement of the Employees and reducing time of reports in administrative. The “patient safety” had a mean equal to 3.65. The patient safety practices should apply low medication error, low postoperative infection, more safety environment and quick complain resolution. The standard deviations of the variables are between (0.70 – 0.75) playing around the mean defining those results are not highly

varying around the mean. The descriptive results defined that 84.5% of the respondents have a university education BA, Master and Doctorate. This output defines those respondents are holding suitable academic educational knowledge enabling them to strongly practice their duties and solve business problems. It is defined that 47.3% of the respondents are nurses and laboratory employees and 36.4% of the respondents are doctor’s visitors. This result defines those hospitals are hiring suitable number of nurses, laboratory and doctor’s visitors in order to take care of patients and provide them suitable medical services. The descriptive results provided about 32.5% of the employees are working in hospitals more than 10 years. This process defined that a suitable number of the employees had a good experience in working at hospitals.

AMOS Interpretation

The researcher examines the data collected from the respondents through AMOS software by applying confirmatory factor analysis after investigating KMO, determinant and factor analysis.

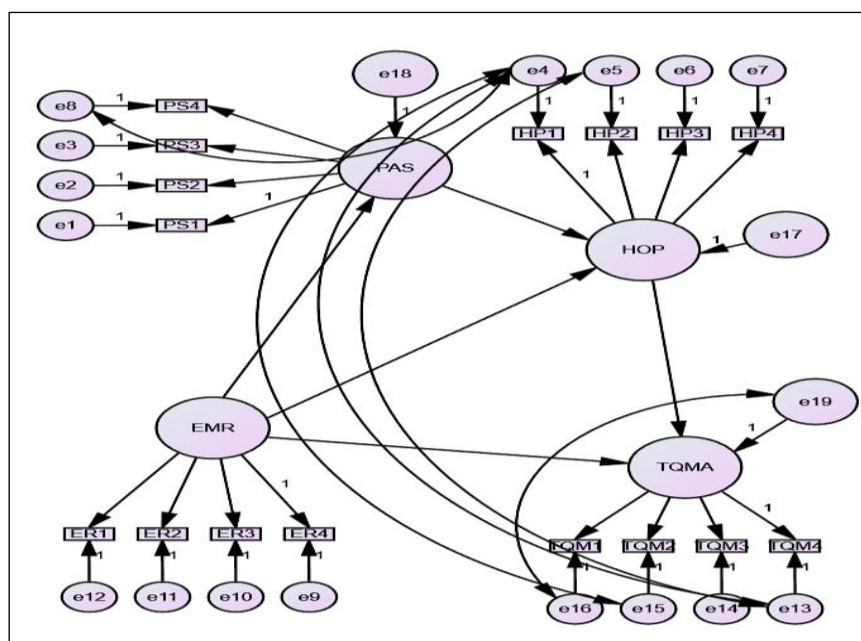


Figure 2: Results after Modification Indices of the Quality Management and Patient Safety Variables

Note: TQM: Total Quality Management, ER: Employee Reporting, HP: Hospital Planning, PS: Patient Safety.

The variables interpreted in Figure 2 are the Total Quality Management, Employee Reporting, Hospital Planning and Patient Safety. It is shown in Figure 2 that hospital planning is a mediator

variable between employee reporting and total quality management. Therefore, patient safety is a mediator variable between employee reporting and hospital planning.

Table 1: Regression Weights of Variables and Elements Interpretations

			Estimate	S.E.	C.R.	P-value
Patient Safety	<---	Employee Reporting	0.105	0.04	2.35	0.019
Hospital Planning	<---	Patient Safety	0.125	0.04	2.79	0.005
Hospital Planning	<---	Employee Reporting	0.303	0.04	7.12	***
Total Quality Management	<---	Hospital Planning	0.175	0.04	4.36	***
Total Quality Management	<---	Employee Reporting	0.616	0.04	13.9	***

Note: S.E. = Standard Error, that evaluate the accuracy of the results. C.R. = Critical Ratio, for testing the estimate difference from zero. P value *** result is very small and less than 0.001

Table 1 shows that the regression weights about the variables and elements of the structural equation model through the Amos software are defined in the paragraph below. In Table 1 shows that the “estimate” defined the expected consequence of one element to another element. S.E. is the standard error that is the value of the variable that is estimated due to the sampling error. C.R. is the critical error resulted through dividing the estimate by the standard error. There are strong correlations between variables that are greater than 2.79. Employee Reporting has direct effect on Patient Safety with an estimate equal to 0.105 providing a weak relationship. Patient Safety is predictable to be enhanced by 0.105 units from the employee reporting. P result is equal to 0.019 below 0.05 providing acceptable result for the regression interpreted. Patient Safety has direct effect on Hospital Planning with an estimate equal to 0.125 providing a weak relationship. Hospital Planning is predictable to be enhanced by 0.125 units from the Patient Safety. P result is equal to 0.005 below 0.05 providing acceptable result for the regression interpreted. Employee Reporting has direct effect on Hospital Planning with an

estimate equal to 0.303 providing a medium relationship. Hospital Planning is predictable to be enhanced by 0.303 units from the employee reporting. P result is equal to 0.000 below 0.05 providing acceptable result for the regression interpreted. Employee Reporting has direct effect on Total Quality Management with an estimate equal to 0.175 providing a weak relationship. Total Quality Management is predictable to be enhanced by 0.175 units from the employee reporting. P result is equal to 0.000 below 0.05 providing acceptable result for the regression interpreted. Hospital Planning has direct effect on Total Quality Management with an estimate equal to 0.616 providing a medium relationship. Total Quality Management is predictable to be enhanced by 0.616 units from the Hospital Planning. P result is equal to 0.000 below 0.05 providing acceptable result for the regression interpreted. H1 is acceptable: Employee Reporting has a Positive Impact on Total Quality Management Partially Mediated by Hospital Planning. H2 is acceptable: Employee Reporting has a Positive Impact on Hospital Planning Partially Mediated by Patient safety.

Table 2: The Model Fit Summary

Model	RMR	GFI	AGFI	NFI	CFI	RMSEA
Default model	0.025	0.969	0.956	0.963	0.987	0.030

Note: RMR: Root Mean Square, GFI: Goodness of Fit Index, AGFI: Adjusted Goodness of Fit Index, NFI: Normed Fit Index, CFI: Comparative Fit Index, RMSEA: Root Mean Square Error of Approximation

Table 2 presented the model fit summary indices that are related to the AMOS confirmatory factor analysis, they are as follows: RMR is the Root mean square residual equal to 0.025 below 0.08 providing acceptable result describing a suitable proportion of the modification by the model. GFI is the Goodness of fit index equal to 0.969 is greater than 0.9 providing a good fit result. AGFI is the adjusted Goodness of fit index is equal to 0.956 is greater than 0.9 and defining acceptable results. CFI is equal to 0.987 is greater than 0.95 providing acceptable result. RMSEA is the Root mean square

error of approximation is equal 0.03 below 0.05 defining good fit of result.

Discussion

The results defining that Employee Reporting has a Positive Impact on Total Quality Management Partially Mediated by Hospital Planning come with the following discussion that employees reporting had a direct role in improving the outputs of the organization defining that the reports of the employees applying Chat GPT had an average more than 1.8 out of 2 in providing accurate results (13).

Reporting has a direct effect on the patient satisfaction in health care services providing that reporting including the first aid of the medical training has a high score about 250 with an acceptable $P < 0.000$ in providing high patient satisfaction (14). Organization reporting has a direct on performance and quality management defining that a suitable length of the report will lead to total quality management during COVID-19 (15). Planning behavior has a direct effect on total quality management of the organization providing that good planning process including high measurement will lead to enhance the quality of the management (16). Planning led to suitable total quality management in the organization (17). The results mentioning Employee Reporting has a Positive Impact on Hospital Planning Partially Mediated by Patient safety come with patient safety increases hospital planning to reach patient satisfaction because 1 over 10 patients aren't taken safety during their care that led to increase the hospital planning for enhancing patient care (22). Patient safety is related to the quality of health care and the management process to be reported as a priority therefore, more than 40% of the medical staff rated the patient safety having low level and hospitals need to stress more on hospital planning and reporting process (23). Good hospital planning will lead to good health care with the employee reporting make them achieve Patient safety by enhancing the decision making of the medical staff and the quality of the services delivered and providing good quality of the hospital process and planning (24). Good communication between employees through reporting and great planning will push the hospital to achieve Patient safety defining that the correlation between hospital planning and patient safety had about 0.64 a high positive correlation (25).

It is recommended to apply Chat GPT for employee report for the X Ray and technician analysis result and decision making. Employees working in the medical field have a weak first aid skills and need more training application and education for the patient safety. Employees should provide the suitable length of the report in order to reach the best quality of the management. Managers should stress on planning management and knowledge process in order to reach total quality management. Patient safety should be always be measured and totally efficient through applying

hospital reports and hospital planning. Medical staff should do more control, provide good environment and access more training on patient safety. Medical staff should stress on high accurate decision making with high experience analysis for reaching the patient safety. Patient safety culture should be enhanced and improved in a technical way through providing more medical instructions and good directions for high level of performance.

Conclusion

This paper purposes to discover the Interplay of Total Quality Management, Employee reporting and hospital planning for enhanced patient safety development at Dr. Abdullah Al-Rassi Governmental Hospital in Akkar and Al-Minieh Governmental Hospital in North Lebanon. During the period of November 2025, the data were collected for 550 respondents. A descriptive method and quantitative techniques were applied by the researcher. Data were collected and gathered through a Likert scale tool to be analyzed and discovered the effect between variables. The correlation matrix of the elements equals to 0.00,1 the Sample Adequacy the KMO is providing a result equal to 0.886 and the sig is equal to 0.000 The Approx chi-square is equal to 3751.2. The correlation interpretations of the variables are defined that the Sig of the variables quality management, reporting, planning and patient safety is below 0.05 providing acceptable results. Each unit increases from the independent variable "Employee Reporting" will enhance the achievement of "the mediator "Hospital Planning". Each unit increase from the independent variable "Employee Reporting" will enhance the achievement of "the mediator "Patient safety". "Total quality management" had the largest mean between variables providing an output of mean equal to 3.88 that is seen as quite acceptable and need to be improved. The confirmatory factor analysis provided that there are strong correlations between variables that are greater than 2.79. Employee Reporting has direct effect on Patient Safety with an estimate equal to 0.105 providing a weak relationship. H1 is acceptable: Employee Reporting has a Positive Impact on Total Quality Management Partially Mediated by Hospital Planning. H2 is acceptable: Employee Reporting has a Positive Impact on Hospital Planning Partially Mediated by Patient safety. The

model fit summary indices that are related to the AMOS confirmatory factor analysis the RMR, GFI, AGFI, NFI, CFI and RMSEA are defining good fit of results. The limitations of this paper are going around the geographic interpretation of two hospitals in north Lebanon, time limitation on delivering questionnaires on November 2025, subject limitation of examining total quality management, reporting points, planning elements, patient satisfaction and, respondent limitation of technicians, nurses, administrative, laboratory and doctors.

Future studies should be investigated about the role of artificial intelligence on the patient satisfaction. More research should be applied about the impact of total quality management, the information system and risk management.

Abbreviations

ER: Employee Reporting, HP: Hospital Planning, PS: Patient Safety, TQM: Total Quality Management.

Acknowledgment

We express our thankfulness to the Dr. Abdullah Al-Rassi Governmental Hospital in Akkar and Al-Minieh Governmental Hospital in North Lebanon who cooperated with this research by filling up the questionnaires and providing suitable data.

Author Contributions

Maher El Cheikh: Introduction, Literature Review, Methodology, Data, SPSS, AMOS, Results Analysis. Maher Ghazal: Reviewing, Editing, Supervision, Writing.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the study of this article.

Data Availability

The data used in this study are available from the corresponding author upon reasonable request.

Declaration of Artificial Intelligence (AI) Assistance

The authors declare that there is no use of Generative AI and AI Assisted Technologies in the Writing Process. The authors take full responsibility for the content's originality, interpretation and accuracy.

Ethics Approval

The authors applied the ethical standards of the International Research Journal of Multidisciplinary Scope in this manuscript. Informed consent was obtained from each participant about this manuscript. Participants were informed about the study's purpose, their right to withdraw at any time and the confidentiality of their data.

Funding

No funding was received

References

1. Arzubagi U, Schiavone F, Mohamad TA, Chen J. Exploring success factors of marketing in private healthcare organizations: evidence from Lebanon. *Journal of Business & Industrial Marketing*. 2022;37(8):1734-44. <http://dx.doi.org/10.1108/JBIM-07-2020-0372>
2. El Zouki CJ, Chahine A, Ghadban E, Harb F, El-Eid J, El Khoury D. Exploratory analysis of factors influencing hospital preferences among the Lebanese population: a cross-sectional study. *BMJ open*. 2024;14(11):e085727. doi:10.1136/bmjopen-2024-085727
3. Jrad M. How Total Quality Management (TQM) Revolutionizes Internal Care Units: Insights from North Lebanon Hospital. *International Journal*. 2024;11(2024):357-84. <https://doi.org/10.15379/ijmst.v11i1.3648>
4. Halmin M, Abou Mourad G, Ghneim A, Rady A, Baker T, Von Schreeb J. Development of a quality assurance tool for intensive care units in Lebanon during the COVID-19 pandemic. *International Journal for Quality in Health Care*. 2022;34(2). <https://doi.org/10.1093/intqhc/mzac034>
5. Khalife J, Ekman B, Ammar W, *et al*. Exploring patient perspectives: A qualitative inquiry into healthcare perceptions, experiences and satisfaction in Lebanon. *PLoS One*. 2023;18(8):e0280665. <https://doi.org/10.1371/journal.pone.0280665>
6. El-Jardali F, Fadlallah R. A review of national policies and strategies to improve quality of health care and patient safety: a case study from Lebanon and Jordan. *BMC health services research*. 2017;17(1):568. doi:10.1186/s12913-017-2528-1
7. Habtoor NH, Ali ES, Ateeq AA. Human side of total quality management: a critical review. *International Journal of Intellectual Human Resource Management (IJHRM)*. 2022;3(2):27-32. doi:10.46988/IJHRM.03.02.2022.004
8. Al-Zoubi Z, Qablan A, Issa HB, Bataineh O, Al Kaabi AM. The degree of implementation of total quality management in universities and its relationship to the level of community service from the perspectives of faculty members. *Sustainability*. 2023;15(3):2404. <https://doi.org/10.3390/su15032404>
9. Ahinful AA, Opoku Mensah A, Koomson S, Nyarko FK, Nkrumah E. A conceptual framework of total quality management on innovation performance in the banking sector. *The TQM Journal*. 2023;36(4):1193-

211.
doi:10.1108/TQM-11-2022-0334
10. Teixeira-Quiros J, Justino MDR, Antunes MG, Mucharreira PR, Nunes ADT. Effects of innovation, total quality management and internationalization on organizational performance of higher education institutions. *Frontiers in Psychology*. 2022;13:1-11. doi:10.3389/fpsyg.2022.869638
11. Sohrabi C, Mathew G, Maria N, Kerwan A, Franchi T, Agha RA. The SCARE 2023 guideline: updating consensus Surgical CAse REport (SCARE) guidelines. *International Journal of Surgery*. 2023;109(5):1136-40. <https://dx.doi.org/10.1097/JS9.0000000000000373>
12. Sahoo SK, Goswami SS. A comprehensive review of multiple criteria decision-making (MCDM) methods: advancements, applications and future directions. *Decision Making Advances*. 2023;1(1):25-48. <https://doi.org/10.31181/dma1120237>
13. Rao A, Kim J, Kamineni M, Pang M, Lie W, Succi MD. Evaluating ChatGPT as an adjunct for radiologic decision-making. *MedRxiv*. 2023;1-12. <https://doi.org/10.1101/2023.02.02.23285399>
14. Wang J, Lv C, Song X, *et al*. Current situation and needs analysis of medical staff first aid ability in China: a cross-sectional study. *BMC Emergency Medicine*. 2023;23(128). <https://doi.org/10.1186/s12873-023-00891-x>
15. Arvidsson S, Dumay J. Corporate ESG reporting quantity, quality and performance: Where to now for environmental policy and practice? *Business strategy and the environment*. 2022;31(3):1091-110. <https://doi.org/10.1002/bse.2937>
16. Abbas J, Kumari K. Examining the relationship between total quality management and knowledge management and their impact on organizational performance: a dimensional analysis. *Journal of Economic and Administrative Sciences*. 2023;39(2):426-51. doi: <https://doi.org/10.1108/JEAS-03-2021-0046>
17. El Manzani Y, El Idrissi M, Chouchane R, Sony M, Antony J. A meta-analysis of the relationship between quality management and innovation in small and medium-sized enterprises. *Production Planning & Control*. 2025;36(7):905-24. <https://doi.org/10.1080/09537287.2024.2321284>
18. Ali K, Johl SK. Soft and hard TQM practices: future research agenda for industry 4.0. *Total Quality Management & Business Excellence*. 2021;33:1625-55. <https://doi.org/10.1080/14783363.2021.1985448>
19. Al Shraah A, Abu-Rumman A, Al Madi F, Alhammad FAF, AlJboor AA. The impact of quality management practices on knowledge management processes: a study of a social security corporation in Jordan. *The TQM Journal*. 2022;34(4):605-26. <https://doi.org/10.1108/TQM-08-2020-0183>
20. Sá JC, Vaz S, Carvalho O, *et al*. A model of integration ISO 9001 with Lean six sigma and main benefits achieved. *Total Quality Management & Business Excellence*. 2022;33(1-2):218-42. <https://doi.org/10.1080/14783363.2020.1829969>
21. Fukami T. Enhancing healthcare accountability for administrators: Fostering transparency for patient safety and quality enhancement. *Cureus*. 2024;16(8):e66007. doi:10.7759/cureus.66007
22. Slawomirski L, Klazinga N. The economics of patient safety: from analysis to action. *Organisation for Economic Co-operation and Development*. 2022;145:1-74. <https://dx.doi.org/10.1787/761f2da8-en>
23. Aiken LH, Lasater KB, Sloane DM, *et al*. Physician and nurse well-being and preferred interventions to address burnout in hospital practice: factors associated with turnover, outcomes and patient safety. *JAMA health forum*. 2023;4(7):e231809. doi:10.1001/jamahealthforum.2023.1809
24. Al-Mugheed K, Bayraktar N, Al-Bsheish M, *et al*. Patient safety attitudes among doctors and nurses: associations with workload, adverse events, experience. *Healthcare*. 2022;10(4):631. <https://doi.org/10.3390/healthcare10040631>
25. Draganović Š, Offermanns G. Patient safety culture in Austria and recommendations of evidence-based instruments for improving patient safety. *Plos one*. 2022;17(10):e0274805. <https://doi.org/10.1371/journal.pone.0274805>
26. Saleh S, Muhieddine D, Hamadeh R, *et al*. The determinants of the quality of clinical management among diabetic and hypertensive patients in a context of fragility: A cross-sectional survey from Lebanon. *Frontiers in public health*. 2022;10:844864. <https://doi.org/10.3389/fpubh.2022.844864>
27. Aoun N, Tajvar M. Healthcare delivery in Lebanon: a critical scoping review of strengths, weaknesses, opportunities and threats. *BMC Health Services Research*. 2024;24(1):1122. <https://doi.org/10.1186/s12913-024-11593-w>
28. Bou Sanayeh E, El Chamieh C. The fragile healthcare system in Lebanon: sounding the alarm about its possible collapse. *Health Economics Review*. 2023;13(21). <https://doi.org/10.1186/s13561-023-00435-w>
29. Choueiry G, Henaine AM, Darwish R, Salameh P. Quality of Outpatient Care in Lebanon: A Cross-Sectional Survey. *Patient Experience Journal*. 2024;11(3):175-84. <https://doi.org/10.35680/2372-0247.1958>
30. McCall SJ, El Khoury TC, Ghattas H, *et al*. Maternal and infant outcomes of Syrian and Palestinian refugees, Lebanese and migrant women giving birth in a tertiary public hospital in Lebanon: a secondary analysis of an obstetric database. *BMJ open*. 2023;13(2):e064859. doi:10.1136/bmjopen-2022-064859
31. Koleilat N, Saadieh T, El Arwadi T, *et al*. Lebanese medical students' attitudes towards patient safety and medical error disclosure: a cross-sectional study. *Journal of International Medical Research*. 2024;52(5):3000605241253728. <https://doi.org/10.1177/03000605241253728>
32. Isma'eel H, El Jamal N, Yazbik Dumit N, Al-Chaer E. Saving the Suffering Lebanese Healthcare Sector Immediate Relief while Planning Reforms. *Mediterranean Journal of Emergency Medicine & Acute Care*. 2020;4(3):1-11. <https://doi.org/10.52544/j5.62024>

33. Moussallem M, Zein-El-Din A, Hamra R, Rady A, Asmar MK, Bou-Orm IR. Evaluating the governance and preparedness of the Lebanese health system for the COVID-19 pandemic: a qualitative study. *BMJ open*. 2022;12(6):e058622.
https://doi.org/10.1136/bmjopen-2021-058622?urlappend=%3Futm_source%3Dresearchgate.net%26utm_medium%3Darticle
34. Ahmed S, Hawarna S, Alqasmi I, Mohiuddin M, Rahman M, Ashrafi D. Role of Lean Six Sigma approach for enhancing the patient safety and quality improvement in the hospitals. *International Journal of Healthcare Management*. 2024;17(3):1-11.
<https://doi.org/10.1080/20479700.2022.2149082>
35. Ohm BW. Analyzing action/plan consistency: The role of the staff report. *Journal of the American Planning Association*. 2020;87(1):11-20.
[doi:10.1080/01944363.2020.1785926](https://doi.org/10.1080/01944363.2020.1785926)
36. Van Zyl-Cillie M, Van Dun DH, Meijer H. Toward a roadmap for sustainable lean adoption in hospitals: a Delphi study. *BMC health services research*. 2024;24(1088).
<https://doi.org/10.1186/s12913-024-11529-4>
37. Shi P. Feasibility analysis of total quality management in medical quality management and its impact on work efficiency. *Frontiers in Medicine*. 2025 Dec 10;12:1701801.
<https://doi.org/10.3389/fmed.2025.1701801>

How to Cite: Cheikh ME, Ghazal M. Interplay of Total Quality Management, Employee Reporting and Hospital Planning for Enhanced Patient Safety. *Int Res J Multidiscip Scope*. 2026;7(4):249-261.
DOI: 10.47857/irjms.2026.v07i04.010741

Appendix 1

Questionnaire

Part 1: Demographic						
Respondent Education	H-School	BA	Master	Doctorate		
Position	Technician + X-ray Imaging	Administrative	Nurse + Laboratory	Doctor	Doctors visitors	
Number of years working in the enterprise	1-2	3-5	6-10	11-20	>20	
Please put "X" in the box that applies		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Part 2: Total Quality Management						
Low waiting appointment time						
Suitable Training and education for employees						
Adequate performance management system						
Employee empowerment I highly applied						
Part 3: Employee reporting						
Employee reporting describes the content of the case						
Employee reporting provides decision making						
Employee reporting analyses the current case						
Employees reporting provides best guidance of practices						
Part 4: Hospital planning						
Development of changes is regularly applied						
A Clear strategy is applied						
The Hospital recommends the engagement of the Employees						
Reducing time of reports in administrative process is applied						
Part 5: Patient safety						
Low medication error						
Low postoperative infection						
Safety environment						
Quick complain resolution						