

The Impact of Total Quality Management on Knowledge Creation

Nadera Hourani
Saudi Arabia

Abstract

The current study aimed to reveal the impact of Total Quality Management on Knowledge Creation in Jordanian pharmaceutical companies. The study employed the descriptive analytical method. The population consisted of all Jordanian pharmaceutical companies employees in the departments of quality assurance, quality control, research and development, and production, while the sample consisted of (334) employees. (368) questionnaires were distributed; only (345) of them were retrieved, where the loss amounted to (23), and (11) questionnaires were excluded due to their invalidity for analysis. The results showed that there is there is an impact on Total Quality Management and its variables (Customer Focus, Teamwork, and Training) on Knowledge Creation. The study recommended the need to activate the principles of teamwork and training among employees in Jordanian pharmaceutical companies. It also emphasises the importance of maintaining the level of customer focus by continuing to provide high-quality services that satisfy their needs.

Keywords: Total Quality Management, Knowledge Creation.

1. Introduction

Quality has been one of the most important subjects that companies have focused their attention on for the last couple of decades, with the aim to achieve its goals throughout planning, assuring, monitoring, and improving it. Today in the modern world, quality management became a crucial business function that ensures the involvement of people, regardless of their profiles, departments, or roles within the company in order to be able to satisfy quality demands. In light of the preceding, total quality management is considered the strategic attempt of a company, which aims mainly at realising coordination and improvement in every functional aspect, with satisfying customers' need as the end goal (Rajeshwaran & Aktharsha, 2017).

Throughout the world today, companies are now faced with a challenge that was created as a result of the rapid changes occurring within the business environment. These changes imposed a need on companies to entirely change their ways of operation and improve their performance in order to be able to stay competitive and have the upper hand in today's competitive environment, and in order for these companies to cope with the continuously changing expectations and demands, the need for constant improvement of the organisational performance arose. Thus, companies were obliged to employ total quality management and knowledge management practices to improve their performance (Zwain, 2012).

As a result, workers' knowledge and productivity became some of the most important assets for both profit and non-profit companies in the 21st century, and today's managers became increasingly aware of the importance of knowledge as a primary source. Knowledge flow management has also become an important part of management responsibility within a company, which is due to the effective use of knowledge assets. Thus, companies are now implied to make better decisions and improve knowledge within their working spaces. Many modern industries in the competitive world nowadays have concluded that continuous improvement, as well as organisational performance, became essential to ensure survival in today's competitive world. Therefore, companies relied on total quality management and knowledge creation to build competitive advantage (Asil et al., 2013).

Thus, the practical orientations of total quality management began with the initiation of the development of objective standards and specifications for measurements related to the qualitative changes of the product and seek to adapt the design with its conformity to ensure a competitive advantage by using practical and statistical methods to control the quality of the product or service. The purpose of this research is to identify the impact of total quality management on knowledge creation at Jordanian pharmaceutical companies.

1.1. Problem Statement

Jordanian pharmaceutical companies face many challenges, given the rapid developments and the constant changes in the external environment. This is due to the rapid technological development and the information and communication revolution that the world has witnessed since the dawn of the new millennia, where Jordanian pharmaceutical companies started to face serious problems, which contributed significantly to an increase in competition.

Despite the fact that many Jordanian pharmaceutical companies began to adopt total quality management within the last two decades, the scope of literature on total quality management and its impact on knowledge creation is still very limited. Therefore, this study aims to investigate the impact of total quality management on knowledge creation at Jordanian pharmaceutical companies.

1.2. Objectives of the Study

The present study seeks to explore the impact of total quality management on knowledge creation at Jordanian pharmaceutical companies by:

1. Creating a conceptual structure for the dimensions of total quality management and knowledge creation;
2. Determining the levels of practice of the study variables (total quality management, knowledge creation);
3. Identifying the role and dimensions of total quality management (customer focus, teamwork, and training) in the surveyed companies;
4. Developing a precise strategy that other industrial companies can benefit from in developing the quality of their products;
5. Providing ideas for decision-makers on how to implement total quality management and its impact on knowledge creation at Jordanian pharmaceutical companies.

1.3. Significance of the Study

The significance of this research lies within its aims to create a conceptual framework for total quality management and knowledge creation and identify their sub-variables, which are suitable for measuring the phenomenon correctly, and in a way, that serves the current research, as well as future research and studies. This research also aims to increase the level of clarity in the concepts and dimensions of super- and sub-variables, and shed some light on the vital and important issues of total quality management and its impact on knowledge creation. It will also pave the way for future researchers to expand the scope of total quality management and its impact on knowledge creation at Jordanian pharmaceutical companies.

1.4. Hypotheses of the Study

Main Hypothesis (H_{01}). There is no impact on total quality management at ($\alpha \leq 0.05$) on knowledge creation.

This hypothesis is divided into three sub-hypotheses:

- H_{01-1} . There is no impact of customer focus at ($\alpha \leq 0.05$) on knowledge creation.
- H_{01-2} . There is no impact of teamwork at ($\alpha \leq 0.05$) on knowledge creation.
- H_{01-3} . There is no impact of training at ($\alpha \leq 0.05$) on knowledge creation.

2. Literature Review

2.1. Total Quality Management

Total Quality Management is a concept, which was created by William Edwards Deming. Deming, who was an American statistician, was one of the people who worked with the aim to formulate the strategies that would eliminate waste and variability from all industrial operations. He was also the first person to develop what we know today as “the quality management philosophy” by trying to improve Shewart’s techniques, thus, coming up with what is known today as Statistical Process Control (SPC). The Statistical Process Control is the theoretical foundations of total quality management (Alghamdi, 2016). For his accomplishments within this field, the Japanese decided to memorialise Deming by creating an award that carries his name, which was practically the equivalent of the Nobel Prize within the world of manufacturing (Kudtarkar, 2014).

Total quality management is a term used to describe the attitude, culture, and the organisation of any company that attempts to provide its customers with services and products that meet their needs. This type of culture demands a high-quality performance from a company throughout all the phases of each operation.

This became the most accepted approach by both managers and quality practitioners as the new Meta for quality management and was entitled to a crucial function in management development. In this light, total quality management is considered a strategy that aims to enhance the aspects of flexibility, effectiveness, productivity, and competitiveness within a company to ensure the satisfaction of the customers and that their demands are met. The main aim of total quality management is to sustain a strong, competitive advantage for the company by achieving excellence, giving the right first impression, attaining efficient and dynamic solutions, satisfying customers and suppliers, and escalating the company's performance by a steady increase in terms of activities performed (Halis et al., 2017).

Total quality management can also refer to the management strategy that includes all organisational functions with the ultimate aim of satisfying customers' needs and achieving the missions and the vision of the company. Total quality management ensures that both employees and managers are jointly engaging in the process of producing goods and services, which can contribute to an increase in future opportunities and reduces chances of failure. Before, total quality management activities were practised frequently within manufacturing operations, but now, it is being widely adopted by the public sector and service companies as well. There are a number of activities that are involved with total quality management, such as team improvement, reduction of the time required for change to occur, focus on improving business plans, cutting the unnecessary cost of products and services, creating systems to facilitate improvement, setting a higher end goal than the ones already achieved, brainstorming, and employee empowerment. If such activities were practised by all departments within a company, the business will improve considerably, and customer satisfaction will be achieved (Faloudah et al., 2015).

2.1.1. Customer Focus

Companies depend entirely on the satisfaction of their customers, and thus, these companies must be aware of their customers' current and future needs and desires, and attempt their best at achieving them and even try to exceed their expectations. This can be achieved through performing research as well as understanding all the customers' needs and expectations regarding products and services, delivery dates, prices and reliability. A company also needs to link its goals with these needs and expectations, and follow a path that ensures that it maintains a balance between the needs and expectations of both customers and other stakeholders. This can be achieved by measuring customer satisfaction and acting according to the results while ensuring the interests of both ends are being met (Al-Damen, 2017).

Customer satisfaction can be defined as the degree to which customers perceive their needs and whether they are being met by the products and services of a company. A company could measure customer needs and expectations by involving those said customers in the process of quality improvement and thus determine the degree of customer satisfaction. The importance of customer satisfaction lies in its presentation of the consumer's feeling toward the final products and goods; these consumers are essentially considered as the most crucial part of the production line, and at which quality should be focusing on in terms of present and future needs. Therefore, it is preferred that the customer is involved closely in the processes of product design and development, and provides input during every stage of the process. This way, there won't be as much problem in the quality field and it will be more likely that the final product will be up to meet those customers' expectations. In addition, being able to access information that provides customers' opinions and complaints regularly, as well as the correct utilisation of such information will help managers improve the quality of their company's products to meet up with the dynamic expectations of customers of the company and modify their operations accordingly (Jaafreh, 2013).

2.1.2. Teamwork

Teamwork has become one of the most used terms in the daily organisational life nowadays. It is often referred to in the literature and theories of business as the "participative management." The primary principle of teamwork is that it must virtually involve activities such as decision-making, goal setting, and other managerial activities in each and every level of the organisational hierarchy, even among employees. There are many known advantages to teamwork, which is also known as the "science of cooperation," the first of which is its exercise of "power with" instead of "power over," which is essentially one of the major strong points of teamwork. It encourages working together and sharing the power between both management and employees instead of that power being exclusive to one group without the other.

Its importance also lies in the concept of coordination and employing it to generate functional unity within the company, which is best achieved through the collaboration and interpretation of ideas in a pattern of integration, circular response, and elicitation. However, teamwork requires the participation of every member of the company and actually offering all that they can offer for the sake of the success and prosperity of the company (Van Ho, 2011). The role of the teamwork is to solve the problems and find common solutions through cooperation, while ensuring each individual has a role in the process, listening to their suggestions and taking advantage of their skills to ensure the improvement of the quality of services and goods provided and invent new methods that achieve the goals of the company. Teamwork is defined as an effective corporate strategy of total quality management, based on collaboration between employees to achieve goals, realise integration and reach common goals (Matthews & McLees, 2015).

2.1.3. Training

Training is a universal truth within the business scenario of today's world, as it helps employees to perform their jobs in a much smoother manner and with ease. It also helps increase employee's abilities, competencies, and knowledge, which will evidently encourage them to perform their work efficiently in a way that would save time and resources. Training can help employers know the capacity of their employees' abilities and whether or not these employees have the potential to advance or receive high-level jobs in the future. It can also help the employees themselves realise their true worth within their company and help further progress. Training is also beneficial for employers as it helps them plan a proper succession planning that fills the important roles in the company from within instead of hiring others and spending time and resources to train them and familiarise them with every aspect of the company. Ultimately, training can help employees achieve organisational objectives (Gul et al., 2012).

Training is defined as a mean to develop and improve the capabilities of employees to enable them to employ creativity and innovation, and to refine their talents in line with the nature of the business of the company, and to provide human resources with high efficiency that can enhance and sustain the overall business (Dostie, 2014). Training can be also defined as enhancing staff capabilities and improving their performance through effective training courses and programs that help them develop their team spirit, develop their innovative ideas and practices, and employ them in the right place. Thus, and in order to implement training and achieve its goals, the company must strive to train its employees, improve its production processes, develop its equipment and methods, and develop the capabilities of its human resources to provide the best results for the company (Chen & Chang, 2016).

2.2. Knowledge Management

There have been many definitions of Knowledge management that differ according to perspectives. On one hand, it has been defined as being a systematic process that aims to capture and communicate with knowledge that all people can use. On the other hand, it has been defined as understanding the available knowledge assets and finding a suitable way to profit from them. However, knowledge management can be simply defined as the process of sharing knowledge with others. As noticed, all these definitions emphasised human knowledge and how it brings value to a company. However, utilising employees' expertise in order to get maximum gains is not as easy as it may sound. This is due to the fact that knowledge management is considered a group of very complex systematic and disciplined activities that a company perform to gain the greatest value possible from the knowledge available within its reach. In other words, a company relies heavily on the experiences and understanding of its people as well as documents and reports that are actually available to it in order to compete and maintain a good competitive advantage. Knowledge management requires a number of appropriate initiatives, whether they were organisational, social, or managerial, as well as the utilisation of the appropriate technology at (Reddy, 2012).

2.2.1. Knowledge Creation

Knowledge creation is the first stage of knowledge management. It is associated with either increasing or correcting knowledge. This stage includes activities that are associated with the introduction of a brand-new knowledge to be implemented into the system, which might be acquired through either discovering, developing or obtaining knowledge. The impact of knowledge creation can be examined throughout personal knowledge and collective knowledge creation, which can result in what is known as organisational knowledge later on (Salajeghe et al., 2014).

Knowledge Creation is commonly seen as an unmanageable form, which has stemmed from the numerous attempts that have been performed out by companies to support this process in order to provide employees and workers with the freedom to unleash their creativity. The process of knowledge creation can be executed by the different types of knowledge management systems that include cooperating instruments and the expert networks that help the process of connecting people who share a mutual interest in an emerging idea (Arvin et al., 2014).

3. Research Methodology

3.1. Introduction

This study sought to explore The Impact of Total Quality Management on Knowledge Creation. The resources of the primary data were collected using a survey instrument.

3.2. The Research Instrument

The instrument contains (48) items measuring **the impact of total quality management on knowledge creation**. The questionnaire is being distributed by hand. The questionnaire contains (3) demographic variables and (30) questions represent study variables:

- **Total Quality Management:** it is formulated as benchmarks or objectives to reach, into (3) fields with a total of (21) questions:
 - **Customer Focus:** contains (7) questions;
 - **Teamwork:** contains (7) questions;
 - **Training:** contains (7) questions.
- **Knowledge Creation:** it is formulated into (9) questions.

3.3. Data Analysis and Interpretation

To examine the hypotheses, which were formulated to examine **the impact of total quality management on knowledge creation**. Statistical Package for Social Sciences (SPSS) was used in processing the following statistical techniques and tests in data analysis:

1. **Descriptive Statistical Techniques:** these included means and standard deviations. These techniques were used to illustrate respondents to study fields;
2. **Reliability Test for the Instruments of Measurement:** The reliability of a measure highlights the stability of consistency of instrument;
3. **Frequencies and Percentages:** these describe the demographical variables;
4. **Normality Tests;**
5. **Simple Regression Test:** which aims to explore the direct impact of the variables.

Respondents were asked to read each item, and select one of the choices as follows:

- **Score 5:** For the (strongly agree);
- **Score 4:** For the (agree);
- **Score 3:** For the (neutral);
- **Score 2:** For the (disagree);
- **Score 1:** For the (strongly disagree).

3.4. Population and Sample

The questionnaire was distributed to those who wished to perform it only. (368) questionnaires were distributed to the employees in Jordanian pharmaceutical companies within the departments of Quality Assurance, Quality Control, Research and Development, and Production, where they were asked to determine their level of assessment for each question according to a five-point scale. Only (345) questionnaires were retrieved, where the loss amounted to (23), while (11) questionnaires were excluded due to their invalidity for analysis, leaving only (334) questionnaires. It is classified into its demographic characteristics in Tables (1), (2), and (3).

Table (1) shows that the percent of males from the Sample was (54.2%) meanwhile it was for females (45.8%). For the variable (Educational Level) it seems that the (High School Degree or below) rank achieved (12.6 %), and (Bachelor Degree) rank achieved (74.9 %) and (Master Degree) rank achieved (11.4 %) and (PhD Degree) rank achieved (1.2 %).

Table (1): Demographic Characteristics of the Study Sample

Gender	Sample	
	Frequency	Percentage
Male	181	54.2
Female	153	45.8
Total	334	100.0

Table (2): Demographic Characteristics of the Sample (Educational Level)

Educational Level	Sample	
	Frequency	Percentage %
High School Degree or Below	42	12.6
Bachelor's Degree	250	74.9
Master's Degree	38	11.4
PhD Degree	4	1.2
Total	334	100.0

For the variable (**Experience**) it seems that the (Less than 1 year) rank achieved (1.5 %), and (From 1-3 Years) rank achieved (27.2 %) and (From 3-5 years) rank achieved (66.8 %) and finally (more than 5 years) rank achieved (4.5 %).

Table (3): Demographic Characteristics of the Sample(Experience)

Experience	Sample	
	Frequency	Percentage %
Less Than 1 Year	5	1.5
From 1-3 Years	91	27.2
From 3-5 Years	223	66.8
More Than 5 Years	15	4.5
Total	334	100.0

3.5. Tool Validity

As shown in Table (4), the total Cronbach's alpha for the study fields was above (0.60) which will lead to the stability of the results of this study.

4. Analysis of the Results

Table (4): Cronbach's Alpha for the Study Fields

FieldNumber	Field	Value of (A)
Total Quality Management		
1	Customer Focus	0.787
2	Teamwork	0.737
3	Training	0.846
Knowledge Creation		
1	Knowledge Creation	0.714

4.1. An Overview of All Fields Descriptive

Means and standard deviation were calculated for **total quality management** and its impact on **knowledge creation** in each field, and Table (5) shows the results.

Table (5): Descriptive Statistics for Quality Management and Its Impact on Knowledge Creation

Field Number	Field	Mean	Std. Deviation
F1	Customer Focus	4.26	0.27
F2	Teamwork	4.09	0.32
F3	Training	3.14	0.27
F4	Knowledge Creation	3.90	0.27

As seen from Table (5), the **Customer Focus field** achieved mean which reached (4.26) and a standard deviation (0.27), and the **Teamwork field** achieved mean which reached (4.09) and a standard deviation (0.32), and the **Training field** achieved mean which reached (3.14) and a standard deviation (0.27), and **Knowledge Creation field** achieved mean which reached (3.90) and a standard deviation (0.27).

• Customer Focus Field

Means and standard deviation were calculated for each item in **Customer Focus Field**, and Table (6) shows the results.

Table (6): Descriptive Statistics for the “Customer Focus” Field

Question Number	Question	Mean	Std. Deviation	Rank
4	The pharmaceutical company constantly checks customer feedback.	4.56	0.51	1
3	The pharmaceutical company deals with complaints from customers.	4.43	0.54	2
1	The pharmaceutical company seeks to be proactive in meeting the needs of its customers.	4.38	0.51	3
5	The pharmaceutical company informs customers of their financial obligations in due course.	4.34	0.50	4
2	The pharmaceutical company attempts to predict the problems facing customers.	4.21	0.48	5
6	The pharmaceutical company is concerned with feedback from customers.	3.99	0.55	6
7	The pharmaceutical company seeks to achieve customers' expectations by offering new products.	3.94	0.54	7
Total		4.26	0.27	

As seen from Table (6), the total mean for this field was (4.26) and with a standard deviation (0.27), we also note that the question (4) which is “The pharmaceutical company constantly checks customer feedback.” ranked first with a mean reached to (4.56) and standard deviation reached to (0.51) and the question (7) which is “The pharmaceutical company seeks to achieve customers' expectations by offering new products.” with mean reached (3.94) and standard deviation reached (0.54) came in the final rank.

• Teamwork Field

Means and standard deviation were calculated for each item in **Teamwork Field**, and Table (7) shows the results: As seen from Table (7), the total mean for this field was (4.09) and with a standard deviation (0.32), we also note that the question (11) which is “The pharmaceutical company adopts teamwork policies” ranked first with a mean reached to (4.42) and standard deviation reached to (0.53) and the question (14) which is “Employee satisfaction can lead to better efficiency and would benefit the pharmaceutical company as a whole.” with mean reached (3.79) and standard deviation reached (0.61) came in the final rank.

Table (7): Descriptive Statistics for the “Teamwork” Field

Question Number	Question	Mean	Std. Deviation	Rank
11	The pharmaceutical company adopts teamwork policies.	4.42	0.53	1
9	The pharmaceutical company engages employees in the decision-making process.	4.33	0.49	2
8	The pharmaceutical company provides the opportunity for employees to express their opinions.	4.20	0.51	3
10	The pharmaceutical company emphasises the completion of work through teams.	4.17	0.54	4
12	There is a relaxed atmosphere in the pharmaceutical company for the staff.	3.87	0.62	5
13	The pharmaceutical company is keen to activate the role of every member of the team.	3.83	0.68	6
14	Employee satisfaction can lead to better efficiency and would benefit the pharmaceutical company as a whole.	3.79	0.61	7
Total		4.09	0.32	

• Training Field

Means and standard deviation were calculated for each item in **Training Field**, and Table (8) shows the results. As seen from Table (8), the total mean for this field was (3.14) and with a standard deviation (0.27), we also note that the question (18) which is “The pharmaceutical company develops comprehensive training plans.” ranked first with a mean reached to (3.22) and standard deviation reached to (0.47) and the question (21) which is “The pharmaceutical company is keen to hold training courses to suit the nature of work.” with mean reached (3.04) and standard deviation reached (0.25) came in the final rank.

Table (8): Descriptive Statistics for the “Training” Field

Question Number	Question	Mean	Std. Deviation	Rank
18	The pharmaceutical company develops comprehensive training plans.	3.22	0.47	1
16	The pharmaceutical company encourages employees to participate in training courses.	3.20	0.40	2
15	The pharmaceutical company is keen to hold multiple training courses to develop the capabilities of the staff.	3.16	0.37	3
19	The pharmaceutical company is keen to select qualified trainers for each training course according to the requirements.	3.13	0.38	4
20	The pharmaceutical company develops the skills and competencies of its employees through training.	3.13	0.35	5
17	The pharmaceutical company assesses the performance of the employees benefiting from the training courses.	3.13	0.36	6
21	The pharmaceutical company is keen to hold training courses to suit the nature of work.	3.04	0.25	7
	Total	3.14	0.27	

• Knowledge Creation Field

Means and standard deviation were calculated for each item in **Knowledge Creation Field**, and Table (9) shows the results: As seen from Table (9), the total mean for this field was (3.90) and with a standard deviation (0.27), we also note that the question (29) which is “The pharmaceutical company is keen to undertake activities to promote knowledge creation.” ranked first with a mean reached to (4.49) and standard deviation reached to (0.52) and the question (27) which is “The pharmaceutical company is keen to provide the material and moral facilities for staff to access new knowledge.” with mean reached (3.26) and standard deviation reached (0.49) came in the final rank.

Table (9): Descriptive Statistics for the “Knowledge Creation” Field

Question Number	Question	Mean	Std. Deviation	Rank
29	The pharmaceutical company is keen to undertake activities to promote knowledge creation.	4.49	0.52	1
24	The pharmaceutical company is keen to document the experiences and expertise available to help with creating knowledge.	4.28	0.54	2
25	The pharmaceutical company exploits the energy of those experienced in creating knowledge.	4.25	0.52	3
30	The pharmaceutical company continuously evaluates its success in acquiring new knowledge.	4.17	0.55	4
23	The pharmaceutical company seeks to form committees and working teams to create knowledge continuously.	3.74	0.66	5
26	The pharmaceutical company has an appropriate budget plan to enhance the knowledge creation processes.	3.72	0.56	6
22	The pharmaceutical company constantly searches for available and renewable knowledge from its various sources.	3.65	0.59	7
28	The pharmaceutical company encourages knowledge innovators with incentives and rewards.	3.52	0.58	8
27	The pharmaceutical company is keen to provide the material and moral facilities for staff to access new knowledge.	3.26	0.49	9
	Total	3.90	0.27	

4.1.2. Hypotheses Results

• **H₀₁: There is no impact of Total Quality Management at ($\alpha \leq 0.05$) on Knowledge Creation.**

To check the validity of linear regression for this model VIF and tolerance were calculated for each field for independent variables as Table (10) shows.

As shown in Table (10), it seems that all VIF values are (less than 10) which lead to the compatibility of using regression test.

Table (10): VIF and Tolerance for Each Field for Independent Variables

Field	Tolerance	VIF
Customer Focus	.255	3.917
Teamwork	.249	4.011
Training	.896	1.116

In addition, regarding tolerance values that those values are more than (0.05) which means we can use the regression modelling to test the hypothesis.

In addition, normal distribution test was performed through calculation (Kolmogorov-Smirnov^a) values, and Table (11) shows that.

Table (11): (Kolmogorov-Smirnov^a) for Each Field for Dependent Variables

Field	Kolmogorov-Smirnov ^a	
	Statistic	Df
Knowledge Creation	.236	146

In addition, regarding static values that those values are more than (0.05) which means we can use the regression modelling to test the hypothesis.

- **H₀₁₋₁. There is no impact of customer focus at ($\alpha \leq 0.05$) on knowledge creation.**

We used Simple Regression test to check the direct impact of Customer Focus on Knowledge Creation as shown in Table (12):

Table (12): Simple Regression Test to Check the Direct Impact of Customer Focus on Knowledge Creation

Dependent Variable	R	R ²	F	DF	Coefficients			
					Predictor	B	T	Sig
Knowledge Creation	.674	.455	277.113	1	Customer Focus	0.691	16.674	0.000

As shown in Table (12), the effect of Customer Focus on Knowledge Creation, the result shows that there is significant effect for Customer Focus on Knowledge Creation, because the significant value was (0.000) less than (0.05), the value of R is the square root of R-Squared and is the correlation between the observed and predicted values of dependent variable was (0.674) and The coefficient of determination R² (0.455) therefore, about 45.5% of the variation in Knowledge Creation explained by Customer Focus. Restriction Parameter (F) was (277.113) of the Knowledge Creation will be caused from Customer Focus, and thus we will accept the alternative the hypotheses **“There is an impact Customer Focus on Knowledge Creation, at ($\alpha \leq 0.05$).”**

- **H₁₋₀₂. There is no impact of teamwork at ($\alpha \leq 0.05$) on knowledge creation.**

We used Simple Regression test to check the direct impact of Teamwork on Knowledge Creation as shown in Table (13).

Table (13): Simple Regression Test to Check the Direct Impact of Teamwork on Knowledge Creation

Dependent Variable	R	R ²	F	DF	Coefficients			
					Predictor	B	T	Sig
Knowledge Creation	.822	.676	691.231	1	Teamwork	0.700	26.291	0.000
				332				
				333				

As shown in Table (13), the effect of Teamwork on Knowledge Creation, the result shows that there is significant effect for Teamwork on Knowledge Creation, because the significant value was (0.000) less than (0.05), the value of R is the square root of R-Squared and is the correlation between the observed and predicted values of dependent variable was (0.822) and The coefficient of determination R² (0.676) therefore, about 67.6% of the variation in Knowledge Creation explained by Teamwork.

Restriction Parameter (F) was (691.231) of the Knowledge Creation will be caused from Teamwork, and thus we will accept the alternative the hypotheses “**There is an impact Teamwork on Knowledge Creation, at ($\alpha \leq 0.05$).**”

- **H₁₋₀₃. There is no impact of training at ($\alpha \leq 0.05$) on knowledge creation.**

We used Simple Regression test to check the direct impact of Training on Knowledge Creation as shown in Table (14). **Table (14): Simple Regression Test to Check the Direct Impact of Training on Knowledge Creation**

Dependent Variable	R	R ²	F	DF	Coefficients			
					Predictor	B	T	Sig
Knowledge Creation	.329	.108	40.343	1	Training	0.333	6.352	0.000
				332				
				333				

As shown in Table (14), the effect of Training on Knowledge Creation, the result shows that there is significant effect for Training on Knowledge Creation, because the significant value was (0.000) less than (0.05), the value of R is the square root of R-Squared and is the correlation between the observed and predicted values of dependent variable was (0.329) and The coefficient of determination R² (0.108) therefore, about 10.8% of the variation in Knowledge Creation explained by Training. Restriction Parameter (F) was (40.343) of the Knowledge Creation will be caused from Training, and thus we will accept the alternative the hypotheses “**There is an impact Training on Knowledge Creation, at ($\alpha \leq 0.05$).**”

5. Discussion and Recommendations

5.1. Discussion

5.1.1. Discussion of the Results

First: Total Quality Management

The results of the means and standard deviation of the total quality management fields from the point of view of the analysis unit showed that they were high, where the customer focus came first, and the training field came last. This indicates that Jordanian pharmaceutical companies care about implementing strategies and plans that would improve the services and goods provided in their companies, as well as their keenness to improve performance and develop the mechanisms of work in order to achieve high-quality service.

Customer Focus

The results showed that the total mean and standard deviation of the customer focus field were high. Item (4) ranked first with high importance, while Item (7) came in the last place with high importance. This is because Jordanian pharmaceutical companies are keen to attract the largest segment of customers by meeting all their needs and developing products that will satisfy them.

Teamwork

The results showed the total mean and standard deviation of the customer focus field were high. Item (11) ranked first with high importance, while Item (14) came in the last place with high importance. This is because Jordanian pharmaceutical companies are keen to attract the largest segment of customers by meeting all their needs and developing products that will satisfy them.

Training

The results showed the total mean and standard deviation of the training field were high. Item (18) ranked first with high importance, while Item (21) came in the last place with high importance. This is because Jordanian pharmaceutical companies are keen to hold training courses in order to improve and develop the skills and experiences of their staff, which in turn reflects on the improvement of performance and achieve high quality when producing goods.

Second: Knowledge Creation

The results showed the results showed the total mean and standard deviation of the training field were high. Item (29) ranked first with high importance, while Item (27) came in the last place with high importance.

This is because Jordanian pharmaceutical companies are keen to hold training courses in order to improve and develop the skills and experiences of their staff, which in turn reflects on the improvement of performance and achieve high quality when producing goods.

5.1.2. Discussion of the Hypotheses Results

The main hypothesis (H₀₁) showed an impact of total quality management at ($\alpha \leq 0.05$) on knowledge creation. This is because Jordanian pharmaceutical companies care about implementing strategies and plans that would improve their knowledge-creation abilities that will help improve the services and goods provided by their companies. This hypothesis is divided into three sub-hypotheses:

The first sub-hypothesis (H₀₁₋₁) showed an impact of customer focus at ($\alpha \leq 0.05$) on knowledge creation. This is due to the awareness of Jordanian pharmaceutical companies of the importance of attracting new and existing customers by satisfying their wishes, responding to their expectations, and achieving them, and its effect on knowledge creation.

The second sub-hypothesis (H₀₁₋₂) showed an impact of teamwork at ($\alpha \leq 0.05$) on knowledge creation. This is due to the keenness of Jordanian pharmaceutical companies to encourage employees to work in teams, in order to generate and invent new ideas that would achieve a competitive advantage, and thus, enhancing their abilities to create knowledge.

The third sub-hypothesis (H₀₁₋₂) showed an impact of training at ($\alpha \leq 0.05$) on knowledge creation. This is due to the keenness of Jordanian pharmaceutical companies to hold training courses in order to improve and develop the skills and abilities of employees and to provide them with new experiences that would induce their creativity and enhance their abilities to create new knowledge.

5.2. Recommendations

Based on the results, the study recommends that:

1. The necessity for Jordanian pharmaceutical companies to maintain their total quality management practices in order to improve performance, maximise profits, and have an overall positive impact on knowledge creation;
2. The necessity for Jordanian pharmaceutical companies to pay attention to the development of training plans for their employees in order to improve their abilities to develop the products and improve their quality properly;
3. The necessity to maintain the level of customer focus by continuing to provide high-quality services that could satisfy their needs and desires.

6. References

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