

The Impact of Knowledge Creation on Organizational Innovation at Jordanian Medicine Industry

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Abstract

The study aimed to identify the impact of the knowledge creation on organizational innovation at Jordanian pharmaceutical companies, from the perspective of the sample members to the level of adopting knowledge creation modes, and the level of organizational innovation in Jordanian pharmaceutical companies. To achieve the objectives of the study, the researcher developed a questionnaire for the detection of knowledge creation modes (socialization, externalization, combination, and internalization) and the level of organizational innovation. The study sample consisted of (445) employees at Jordanian pharmaceutical companies. Sample was selected randomly, and in light of this, data was collected and analyzed using the Statistical Package for Social Sciences (SPSS). The found that the arithmetic mean of the estimates of employees at Jordanian pharmaceutical companies towards knowledge creation modes were high, and the arithmetic mean of the estimates of employees towards organizational innovation were moderate. The results of regression analysis that their is statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation on organizational innovation. The results of stepwise multiple also showed that the dimensions of internalization and socialization together accounted for (33.2%) of the changes in the dependent variable (organizational innovation).

Keywords: Knowledge management, Knowledge creation, Innovation, Jordanian pharmaceutical companies.

1.1 Introduction

Under the intensive competition of the global market, companies are urged to innovate in order to succeed even survive. It is reported that successful companies produce 75% of revenues from new products or services that did not exist five years ago (Xu et al. ,2011). Knowledge management is a growing field of interest in business today. It has become the basic framework of a successful business and a critical source of competitive advantage. The process of innovation depends heavily on knowledge, particularly since knowledge impacts firm performance through its efficiency in developing the intellectual assets that are a source of competitive advantage (Davenport & Grover, 2001).

1.2 Importance of the Study

The importance of this study is related to the topics it handles: knowledge creation and organizational innovation. The study explores the process of knowledge creation modes and its impact on innovation. Also, The study will help Jordanian pharmaceutical companies which consider important sector in Jordan through its recommendations and conclusions that will help in managing knowledge creation and organizational innovation.

1.3 Study objectives

The study seeks to achieve a main aim, which is related to exploring the effect of knowledge creation modes on organizational innovation. Based on that main aim, this study aims at identifying:

- 1-The level of adopting knowledge creation in Jordanian pharmaceutical companies from the perspective of the sample members.
- 2- The level of organizational innovation in Jordanian pharmaceutical companies from the perspective of the sample members.

1.4 Problem and Questions of the Study

The problem of the study can be stated in the following question:

- 1- What is the effect of knowledge creation on organizational innovation at Jordanian pharmaceutical companies ?
from this question, the following sub-questions are derived:
 - What are the levels of adopting knowledge creation modes at Jordanian pharmaceutical companies?
 - what is the level of organizational innovation at Jordanian pharmaceutical companies?

1.5 The study model

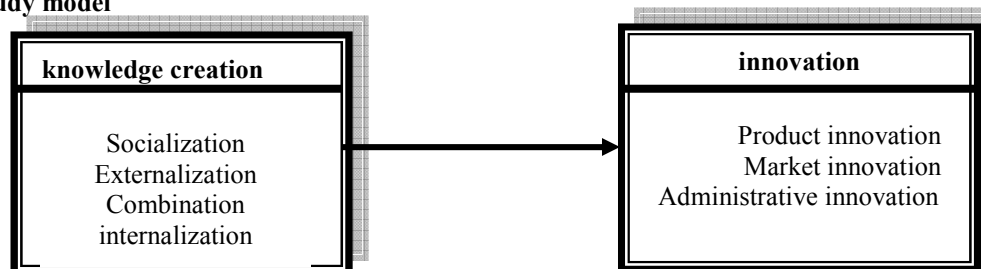


Fig. 1: the study model

The source: prepared by the researcher based on: Nonaka & Takeushi (1995), and Popadiuk & Choo (2006)

1.6 Study Hypothesis

Based on the model of the study, the following hypotheses were developed:

The first hypothesis : there is no statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation on organizational innovation.

The second hypothesis: there is no statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation modes (socialization, externalization, combination, and internalization) on organizational innovation as a whole.

The first minor hypothesis: there is no statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation mode socialization on organizational innovation.

The second minor hypothesis: there is no statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation mode Externalization on organizational innovation.

The third minor hypothesis: there is no statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation mode Combination on organizational innovation.

The fourth minor hypothesis: there is no statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation mode internalization on organizational innovation.

2. Literature review

Several definitions and conceptions of KM exist. These different approaches to KM concentrate on the creation, diffusion, storage and application of either existing or new knowledge (Alavi & Leidner, 2001; Coombs & Hull, 1998). KM concerns the formalization of and access to experience, knowledge, and expertise that create superior performance, encourage innovation, and enhance customer value (Beckman, 1999).

The purpose of KM is to maximize the enterprise's knowledge-related effectiveness and returns from its knowledge assets and to renew them constantly, KM consists of making knowledge visible and developing a knowledge-intensive culture (Davenport & Prusak, 1998).

Nonaka and Takeushi view knowledge as composed of two dimensions: tacit and explicit, the tacit dimension is based on experience, thinking, and feelings in a specific context, and is comprised of both cognitive and technical components. The explicit dimension of knowledge is articulated, codified, and communicated using symbols (Nonaka & Takeushi, 1995). The explicit dimension may also be classified as object based or rule-based. Knowledge is object based when it is codified in words, numbers, formulas, or made tangible as equipment, documents, or models. It is rule based when the knowledge is encoded as rules, routines, or standard operating procedures. It is deeply rooted in action, procedures, routines, commitment, ideas, value and emotions. (Popadiuk & Choo, 2006; Mladkova, 2011).

Lundvall and Johnson mention classification for understanding the different channels and mechanisms through which learning different types of knowledge takes place: Know-what, Know-why, Know-how, and Know-who. (Lundvall & Johnson, 1994; Jensen et al., (2007).

Learning the four types of knowledge tends to take place in different ways and through different channels. While important aspects of know-what and know-why may be obtained through reading books, attending lectures and accessing data bases, the two other categories are more rooted in practical experience. (Matusik & Hill, 1998) form a classification of knowledge across a number of dimensions: individual, collective, tacit, explicit, private, public, component and architectural.

2.1 Organizational knowledge creation

Nonaka and Takeuchi specify four knowledge creation modes as the processes of interplay between explicit and tacit knowledge which lead to the creation of new organizational knowledge: socialization (tacit to tacit), externalization (tacit to explicit), combination (explicit to explicit), and internalization (explicit to implicit).

Socialization yields new tacit knowledge that is built through informal interaction. It occurs by spending time together, making joint hands on experiences, working in the same environment and in formal

social meeting between members of an organization. Externalization is an act of codifying or converting tacit knowledge into explicit knowledge, characterized by more formal interactions such as expert interviews or the sharing of lessons learned in a previous project. Internalization is the process of applying explicit knowledge, thereby absorbing, embodying, and converting it into individually held tacit knowledge. This can be done by either experiencing, or by experimenting (Nonaka et al., 2000).

2.2 Innovation concept

Authors have defined the concept of innovation in many different ways, the term incorporates the phenomenon of novelty and the possibility that its exploitation will create value (Gloet & Terziovski, 2004; Johannssen, 2008). Becheikh defined innovation as implemented technologically new products and processes and significant technological improvements in products and processes (Becheikh et al., 2006).

Darroach & Mcnaughton define innovation as something that is new or improved done by an enterprise to create significantly added value either directly for the enterprise or directly for its customer (Darroach & Mcnaughton, 2002). (Livingstone et al., 1998) refer to innovation as new products or processes that increase value, including anything from patents and newly developed products to creative uses of information and effective human resource management systems.

Innovation is never a one-time phenomenon, but a long and cumulative process of a great number of organizational decision-making process, ranging from the phase of generation of a new idea to its implementation phase. New idea refers to the perception of a new customer need or a new way to produce.

(Afuah, 1998) classifies innovations according to technological, market, and organizational characteristics. Technological innovation is the knowledge of components, linkages between components, methods, processes and techniques that go into a product or service. It can be a product, a process, or a service. Product or service innovations should be new products or services aiming at satisfying some market needs. Process innovation is concerned with introducing new elements into an organization's operations such as input materials, task specifications, work and information flow mechanisms, and equipment used to produce a product or render a service.

Market innovation refers to the new knowledge embodied in distribution channels, product, applications, as well as customer expectations, preferences, needs, and wants. The main idea is the improvement of the components of the marketing-mix, that is, product, price, promotion and place. Administrative innovation involves innovations that pertain to the organizational structure and administrative processes. In this case it can be specifically related to strategies, structure, systems, or people in the organization (Popadiuk & Choo, 2006).

(Oconnor et al., 2004) classifies innovations to radical and incremental innovations, radical innovations are fundamental changes that represent revolutionary changes in technology. They represent clear departures from existing practice. Radical innovation is a major change that represents a new technological paradigm.

Radical change creates a high degree of uncertainty in organizations and industry. It also sweeps away significant parts of previous investments in technical skills and knowledge, designs, production techniques, plants and equipment. The change is not necessarily delimited by the supply side. It comes from a change on the demand side and in the organizational or institutional structure.

Incremental innovations are other changes in products and processes like changes which are insignificant, or do not involve a sufficient degree of novelty. Novelty refers to the aesthetic or other subjective qualities of the product. Time frame for incremental innovation less than radical innovation. Typically, Development structure in incremental innovation is a cross-functional team operates within an existing business unit whereas development structure in incremental innovation tends to originate in R&D.

2.3 Knowledge management and innovation

Innovation is the result of a recombination of conceptual and physical materials that were previously inexistence. The primary task of the innovating firm is therefore to reconfigure existing knowledge assets and resources and to explore new knowledge. Both exploration and exploitation of knowledge have been shown to contribute to the innovativeness of firms and to its competitive advantage. Various studies focus on the role of KM in the innovation process. The results found by (Cantner et al., 2011) concluded that KM significantly increases the success with product innovations and market novelties and KM has a differentiated effect on different types of innovation.

(Huergo, 2006) provides evidence for the positive role technology management plays for the likelihood and success of firm innovations.

(Chapman, 2004) propose that managing innovation in a continuous product innovation perspective implies shifting attention from the product to the process of knowledge creation, sharing, and transfer. (Yang, 2005) examines the impact of knowledge integration and innovation, The results show that knowledge integration and innovation exert significant positive effects on new product performance. The knowledge integration-performance connection is contingent on marketing and manufacturing competences and another two

knowledge management processes: knowledge acquisition and dissemination.

2.4 Conceptual models

Many researches consider knowledge creation is the base for innovation. (Popadiuk & choo, 2006) build theoretical model and propose generic classification of innovation in a knowledge creation perspective. he suggests that knowledge creation is focused on the generation and application of knowledge that leads to new capabilities for the firm. Innovation, on the other hand, is also concerned with how these new capabilities may be turned into products and services that have economic value in markets.

(Schulze & Hoegle, 2008) relate Nonaka and colleagues four knowledge creation modes of socialization, externalization, combination, and internalization to the novelty of product ideas generated. Taking a behavioral perspective on the four modes, the writers find positive relationships between socialization as well as internalization and the novelty of product ideas, whereas the writers postulate negative relationships for externalization as well as combination.

(Johannessen,2008) argues that a company's capabilities are primarily developed on creating new knowledge for innovation, and the social norms and values already existing in the social relations of the company. This in turn influences how the company develops and applies the knowledge basis, thus influencing innovation strategies.

(Maruta, 2011) indicated that insight is the key for knowledge creation and it has a special nature different from information and knowledge it cannot be acquired through learning, but can become usable by activating undeveloped portions of native capabilities .Only knowledge workers who have good insight have the awareness to realize innovations necessary in business.

(McAdam,2004) builds theoretical model to emphasize knowledge creation through distributed cognition and social constructionism . also, he emphasizes knowledge generation through idea screening and total quality management. critical TQM developments used to develop a more integrative approach to idea generation, and hence toward organizational creativity as part of the process of innovation.

(Howells, 2002) propose and discuss theoretical framework which outline the importance of tacit knowledge in the innovation process and to highlight the way that geographical location not only influences the relationship between knowledge and innovative activity, but also affects the way that such interaction influences the geography of innovation and economic activity.

(Nicolas &Cerdan, 2011) shed light on the consequences of knowledge management (KM) strategies on firm's innovation and corporate performance, results show that both KM strategies (codification and personalization) impacts on innovation and organizational performance directly and indirectly (through an increase on innovation capability).

(Xu et al.,2011)mentions in his model that knowledge management strategies (knowledge content and knowledge context) are of great importance for better understanding and application in decisions and actions of innovation. knowledge content concerns the static aspects of knowledge with four dimensions that are extracted in terms of innovation characteristics such as explicitness, novelty, importance and usability. knowledge context is composed of four sub-contexts respectively relating to the context of creation and usage of knowledge.

(Muina et al., 2009) examine knowledge codification and the development of development of technological innovations. He determines that knowledge codification is negatively related to the rate of radical innovations and knowledge codification is positively related to the rate of incremental innovations. Also, knowledge codification that incorporates intellectual property rights protects innovations from being imitated and substituted.

3. Method of the study

3.1 Study Community and Sample

The community of the study consists of (5851) workers in pharmaceutical industry who are employed in (20) pharmaceutical companies. A simple-random sample was chosen from the study community, the sample consists of (445) employee.

3.2 Study instrument

The researcher reviewed the theoretical background and previous studies about knowledge creation and innovation. The researcher also reviewed many questionnaires that used in the previous studies ,so he designed one that reflects knowledge creation and innovation. The parts of the questionnaire are:-

A- **Part one-** background information: - In this part, respondents were asked to indicate their gender, age, level of education, job title, and experience.

B-**Part two-** dimensions of the study:-This part covers dimensions:-

The first dimension –independent variable- knowledge creation which contains (20) items. Knowledge creation contain the secondary dimensions:- items from (H1 to H5) related to socialization, items from(H6 to H10)

related to externalization, items from (H11 to H15) related to combination, and items from(H16 to H20) related to internalization.

- **The second dimension-** dependent variable- is innovation which contains twelve items from (H21 to H32). The innovation contain the secondary dimensions:- items from (H21 to H24) related to technological innovation, items from(H25 to H28) related to market innovation, Items from (H29 to H32) related to administrative innovation.

The participants were asked to identify the degree of their agreement with each item in the second and third sections of the study, using five point Likert scale (5= strongly agree, 4= agree, 3=neutral, 2= disagree, and 1= strongly disagree). The scale was calculated through the following formula:

The highest point of the scale (5) – the lowest point of the scale (1)/ the number of required categories (3) = 1.33. Thus, 1.33 was added to the end of each category, so that the categories and the degree of agreement became as follows (from -1.00 to less than 2.33 = low) and (from 2.33 to 3.66 medium) and (from 3.67 to 5.00 = high).

3.3 Study Validity and Reliability

- Face validity: this is applied in the present study in two phases: First, the questionnaire sent to a pilot sample of (25) workers from different managerial level to assess the clarity of the questionnaire .Second, The questionnaire was reviewed by 15 referees from among the faculty members at Jordanian universities, and some items were adjusted based on their recommendations.

- Instrument reliability:- the current applied Cronbach's Alpha measures the reliability of measurement in similar research. Cronbach's Alpha coefficient value of all dimensions of the study is (85%).

3.4 Procedures of the study:

The researcher distributed (590) questionnaires. The distribution took into consideration covering employees in different levels, functions, experiences, ages, genders, and educational levels. (571) questionnaires were received with the rate of return (97%). Only (26) questionnaires were dismissed because of unusable for statistical analysis. Data were entered and processed statistically through the computer by using SPSS software, and consequently, the researcher obtained the results.

3.5 Statistical methods used

In order to answer the questions of the study and test its hypotheses , the following statistics were employed: percentages , frequencies , One Way ANOVA, simple regression and stepwise multiple regression.

3.6 Data Presentation and Analysis:

A profile of the sample-

The characteristics of the respondents are shown in table (1)

Table (1) Frequencies and Percentages of Demographics factors of the sample

Variable	Characteristics	Frequency	Percentage
Gender	Male	262	58.9%
	Female	183	41.1%
Age	20-29 Years	73	16.4%
	30-39 Years	161	36.2%
	40-49 Years	187	42%
	50+	24	5.4%
Education	Higher School	34	7.6%
	Diploma	45	10.2%
	Bachelor	301	67.6%
	Post Graduate	65	14.6%
Job Title	General Manger	13	2.9%
	Deputy General Manager	83	18.6%
	Assistant General Manger	32	7.2%
	Department Manager	43	9.7%
	Section Head	84	17.8%
	Worker	190	43.8%
Experience Years	Less Than 5 Years	61	13.7%
	6-10 Years	119	26.7%
	11-15 Years	132	29.7%
	More than 15 Years	133	29.9%

3.7 Analysis of the questions of the study:

- What are the levels of adopting knowledge creation modes at Jordanian pharmaceutical companies?

Table 2: means and standard deviations of the level of practicing knowledge creation modes

Rank	dimension	mean	Standard deviation	Degree of assessment
1	combination	4.11	.55	high
2	socialization	4.07	.50	high
3	externalization	3.92	.63	high
4	internalization	3.80	.60	high
Knowledge creation as a whole		3.97	.47	high

Table (2) shows that practicing knowledge creation among members of study sample at Jordanian pharmaceutical companies was high, with a mean of (3.97) and a standard deviation of (0.47), which suggests the similarity of the responses of the participants of the study concerning the knowledge creation.

Table (2) shows also that the means of the responses of the participants of the study concerning modes of knowledge creation ranged between (3.80-4.11), the highest being for the dimension of combination, with a mean of (4.11) and a standard deviation of (0.55) and a high degree of assessment, and lastly came the dimension of internalization with a mean of (3.80) with a mean and a standard deviation of (0.60) and a high degree of assessment.

-what is the level of organizational innovation at Jordanian pharmaceutical companies?

Table 3: means and standard deviations of the level of organizational innovation

Rank	dimension	mean	Standard deviation	Degree of assessment
1	market innovation	3.76	.59	high
3	administrative innovation	3.63	.69	medium
4	product innovation	3.52	.71	medium
Organizational innovation as a whole		3.64	.56	medium

Table (3) shows that practicing organizational innovation among members of study sample at Jordanian pharmaceutical companies was medium, with a mean of (3.64) and a standard deviation of (0.56), which suggests the similarity of the responses of the participants of the study concerning organizational innovation.

Table(3) shows also that the means of the responses of the participants of the study concerning dimensions of organizational innovation ranged between (3.52-3.76), the highest being for the dimension of market innovation, with a mean of (3.76) and a standard deviation of (0.59) and a high degree of assessment, and lastly came the dimension of product innovation with a mean of (3.52) and a standard deviation of (0.71) and a medium degree of assessment.

3.8 Study Hypothesis Testing

The first hypothesis: there is no statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation on organizational innovation.

Simple linear regression was employed as illustrated in tables 4 and 5

Table 4 : results of simple linear regression for the main hypothesis

model	Source of variance	Sum of squares	df	Mean of squares	R	R ²	Adjusted R	F value	significance
Simple regression	Regression	42.135	1	42.135	.544	.296	.294	185.920	.000(a)
	Residual	100.398	443	.227					
	Total	142.534	444						

the table above shows that the value of (f) is (185.920), with a statistical significance of (0.000), which is less than ($\alpha \leq 0.05$), which indicates the interpretive and predictive power for using the simple linear regression model between the independent variable (knowledge creation as a whole) and the dependent variable (organizational innovation) thus, the simple linear regression model is appropriate for the assessment of the causative relationship between the independent variable (knowledge creation) and the dependent variable (organizational innovation). It is also shown that the value of the correlation coefficient between independent variable (knowledge creation) and the dependent variable (organizational innovation) was (.544), and that the value of (R²) was (.296), and the value of adjusted (R²) was (.294) which indicates that the independent variable (knowledge creation) was able to account for (29.4%) of the changes which occurred to the dependent variable (organizational innovation), and the rest is due to other factors.

Table 5 the significance of standardized and unstandardized simple linear regression coefficient of the first hypotheses

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.043	.192		5.433	.000
Knowledge creation	.653	.048	.554	13.635	.000

Table (5) shows that:-

- the presence of a statistical significance for the constant of the simple linear regression formula , (t) value was (5.433) and with a statistical significance of (0.000) which less than ($\alpha \leq 0.05$) which indicates the significance of the constant of the simple linear regression model whose value was (1.043).

- the presence of a statistical significance for the standardized and unstandardized simple linear regression formula related to the independent variable (knowledge creation) in which the value of (t), was (13.635), with a significance of (0.000) which is less than the significance level ($\alpha \leq 0.05$), which indicates the rejection of the null hypothesis , and accepting the alternative hypothesis which states there is statistically significant effect at the level ($\alpha \leq 0.05$) for knowledge creation on organizational innovation.

The second hypothesis: there is no statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation modes (socialization, externalization, combination, and internalization) on organizational innovation as a whole. multiple linear regression was used in exploring the presence of a statistically significant effect of the independent variables on the dependent variable at the significance level ($\alpha \leq 0.05$). Upon inserting the independent variables into the multiple linear regression analysis (socialization, externalization, combination, and internalization) through stepwise method. Table (6) shows that each of the four dimensions has a predictive power and is statistically significant.

Table 6 : multiple linear regression for the first hypothesis

Independent variables	Source of variance	Sum of squares	df	Mean of squares	R	R ²	Adjusted R ²	F value	significance
internalization	Regression	43.757	1	43.757	.554	.307	.305	196.246	.000(a)
	Residual	98.776	443	.223					
	Total	142.534	444						
socialization	Regression	47.708	2	23.854	.579	.335	.332	111.188	.000(b)
	Residual	94.826	442	.215					
	Total	142.534	444						

Table (6) shows that the value of (f) is (111.188) with a statistical significance of (0.000) , which is less than ($\alpha \leq 0.05$) , which indicates the significance and predictive power of the multiple linear regression , between the independent variables (socialization, externalization, combination, and internalization) and the dependent variable (organizational innovation). Thus, the multiple linear regression model suitable for the assessment of causative relationship between the independent variables (socialization, Externalization, Combination, and internalization) and the dependent variable (organizational innovation).

table (6) shows that two independent variables had statistically significant effects on organizational innovation, internalization influence came first concerning the size of the effect, and its multiple correlation coefficient value was (0.554) and the (R²) was (0.307) and the value of Adjusted (R²) was (0.305) which indicates that the internalization mode was capable of accounting for (30.5%) of the changes in the dependent variable (organizational innovation). Socialization came second in terms of the size of the effect, and its multiple correlation coefficient when added to the effect of internalization was (0.579) , (R²) was (0.335) for both dimensions, and the value of their Adjusted R² was (0.332) which indicates that the dimensions of internalization and socialization together accounted for (33.2%) of the changes in the dependent variable (organizational innovation).

Table7: the significance of standardized and unstandardized multiple linear regression coefficient of the first hypotheses

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.661	.143		11.603	.000
Internalization	.520	.037	.554	14.009	.000
(Constant)	1.111	.190		5.847	.000
Internalization	.441	.041	.469	10.784	.000
socialization	.209	.049	.187	4.291	.000

The table above shows:-

-The existence of a statistical significance for the constant of the multiple linear regression formula, in which the value of (t) was (5.847), with a statistical significance of (0.000) which is below the level ($\alpha \leq 0.05$), which

indicates the significance of the constant (1.111).

- The presence of a statistical significance for the coefficient of the multiple linear regression formula related to the independent variable (internalization), for which the value of t was (10.784), with a statistical significance of (0.000), which is below the significance level ($\alpha \leq 0.05$), which suggests the rejection of the null hypothesis and accepting the alternative hypothesis which states that: There is a statistically significant effect ($\alpha \leq 0.05$) for knowledge creation mode internalization on organizational innovation.

- The presence of a statistical significance for the coefficient of the multiple linear regression formula related to the independent variable (socialization), for which the value of (t) was (4.291), with a statistical significance of (0.000), which is below the significance level ($\alpha \leq 0.05$), which suggests the rejection of the null hypothesis and accepting the alternative hypothesis which states that: " There is a statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation mode socialization on organizational innovation.

4. Results and conclusions:-

1-The results related to the first question What are the levels of adopting knowledge creation modes at Jordanian pharmaceutical companies?

Table (2) shows that the level of adopting knowledge creation modes at Jordanian pharmaceutical companies is high with a mean of (3.40) and a standard deviation (0.79). Based on this result, the researcher believes that there is awareness at the Jordanian pharmaceutical companies of the importance of knowledge creation process, also it is provide suitable climates for generate new knowledge.

2- The results related to the second question what is the level of organizational innovation at Jordanian pharmaceutical companies?

Table (3) shows that the level of adopting of organizational innovation at Jordanian pharmaceutical companies is medium with a mean of (3.64) and a standard deviation (0.56). Based on this result, the researcher believes that Jordanian pharmaceutical companies produce human medicines, but cannot continuously provide new medicines. Also, providing any new idea for a new pharmaceutical product, do not come easily, because of the sensitivity of the product, and the difficulty of access to local and international approvals to produce a new drug.

3- The results related to the first hypothesis shows that their is statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation on organizational innovation. Through the results of simple linear regression, it was shown that knowledge creation account for (29.4%) of the changes which occurred to the dependent variable (organizational innovation), and the rest is due to other factors. Based on this result, the researcher believes that Jordanian pharmaceutical companies should invest innovative new ideas, working to turn them into useful products, and providing technical capabilities that relate to inventions and product protection and intellectual property.

The results related to the second hypothesis shows that their is statistically significant effect ($\alpha \leq 0.05$) for the knowledge creation modes on organizational innovation. Through the results of multiple linear regression, it was shown that the dimensions of internalization and socialization together accounted for (33.2%) of the changes in the dependent variable (organizational innovation). Based on this result, the researcher believes that internalization and socialization together help workers to learn, and renew their knowledge through informal meetings, and learned lessons.

5. Recommendations

Based on the results of the study, the researcher recommends Jordanian pharmaceutical companies to :

1- Provide a suitable climate for innovation and generate new styles for their products and services, because its beneficial and increase its market share and competitiveness.

2-Create organizational units for research and development, and increasing interaction between the processes of scientific academic research and business development.

3-Attention to infrastructure of knowledge management such as: organizational structure, organizational culture, technological infrastructure, and physical environment.

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