

Lean Management Tools from the Point View of the workers In Biocare's Enterprise (El Taref) – An analytical study -

أدوات الإدارة الرشيقة من وجهة نظر العاملين بمؤسسة بيوكار (الطارف) - دراسة تحليلية-

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Abstract:

The purpose of this research paper is to shed light on Lean management tools and their availability from the point of view of workers, we distributed a questionnaire (20) paragraph and is distributed in its final form to a representative sample of (70) workers, for this aim we used (spss /IBM23) To analyze various statistical data, One of the most important results of the study: Availability of lean management requirements with its various tools (organizing the work site, continuous improvement, standard work, multifunctional workers) at the level of the enterprise under study .also The study recommended the necessity of empowering workers and partial participation in making some decisions. As well as listening to their opinions and concerns.

Keys words: Lean management, organizing the work site, continuous improvement, standard work, multifunctional workers.

JEL classification codes: M11;M12 ; M15 ; P17

ملخص:

تهدف هذه الورقة البحثية إلى تسليط الضوء على أدوات الإدارة الرشيقة ومدى توفرها من وجهة نظر العاملين، ولهذا الغرض تم تصميم استبيان مكون من 20 فقرة وتم توزيعه في صورته النهائية على عينة ممثلة في (70) مفردة؛ أين تم الاستعانة ببرامج (spss / IBM23) لغرض تحليل البيانات، وقد خلصت الدراسة إلى توفر متطلبات الإدارة الرشيقة بمختلف أدواتها (تنظيم موقع العمل، التحسين المستمر، العمل القياسي، العاملين متعددي الوظائف) على مستوى المؤسسة محل الدراسة؛ وقد أوصت الدراسة بضرورة تمكين العاملين والمشاركة الجزئية في اتخاذ بعض القرارات، وكذا الإستماع لمخالف آرائهم وانشغالهم.

الكلمات المفتاحية: إدارة رشيقة، تنظيم موقع العمل، تحسين مستمر، عمل قياسي، عاملين متعددي الوظائف.

تصنيف JEL: M11, M12, M15, P17

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1-Introduction

Lean management is one of the modern and contemporary concepts that has emerged recently and has prompted many enterprises to try to adopt it as a management method characterized by rapid response to changes and adaptation to the various circumstances surrounding the institution. This management seeks, relying on a set of tools, to find solutions of an administrative and realistic nature for the purpose of improving performance and its development. This is for the purpose of achieving speed in completing tasks and flexibility of the production or service process, for the purpose of continuous improvement of various processes and achieving sustainability.

From this standpoint, the following problem is raised To: **what extent are Lean management tools available at the level of the enterprise under study?**

To answer this problem, the following sub-questions are raised:

- What are the attitudes of the sample members regarding the availability of workplace organization requirements at the level of the institution under study?
- What are the attitudes of the sample members regarding the availability of continuous improvement requirements at the level of the institution under study?
- What are the sample members' attitudes regarding the availability of standard work requirements at the level of the enterprise under study?
- What are the attitudes of the sample members regarding the availability of requirements for multi-functional workers at the level of the enterprise under study?

Study hypotheses:

- The first main hypothesis states: **"Lean management tools are not available in the enterprise under study from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)."**

This hypothesis is divided into the following sub-hypotheses:

- The first sub-hypothesis: "The requirements for organizing the work site in the enterprise under study are not met from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)."
- The second sub-hypothesis: "The requirements for continuous improvement are not met in the enterprise under study from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)."
- The third sub-hypothesis: "The standard work requirements in the enterprise under study are not met from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)"
- The fourth sub-hypothesis: "The requirements for multi-functional workers in the enterprise under study are not met from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)."
- The second main hypothesis states: **"There are no statistically significant differences between the sample members' attitudes regarding Lean management tools due to sociodemographic variables (gender, position, educational level) at the level of significance ($\alpha \leq 0.05$)."**

Approach followed:

The descriptive approach and the analytical approach were relied upon by examining the various literatures of the study, as well as the statistical analysis of the study tool (questionnaire) with the aim of testing hypotheses and drawing conclusions.

2-A conceptual framework for Lean management

Definition of Lean management:

Lean management is working systematically to eliminate processes that have no added value in order to achieve goals with the least possible effort, and also eliminating work that does not create value for the customer, which is called waste. Lean management does not like to produce something that is not used (Obaid Fareed Zakaria, Mahi Muhammad, 2021 , page 74).

Lean management requirements:

The requirements for agile management are (Sabri Muqimh, 2020, p. 42):

- Support senior management;
- Cooperation between management and workers;
- Paying attention to training and training in quantity and quality;
- Change in the organization's culture.

Lean management tools:

Organizing the work site

By relying on methods that make work organized and arranged in a way that maintains the flow of work and organizes the environment surrounding the workers (Harmoush Eman, 2022, p. 5).

Continuous improvement

It is non-stop improvements to all factors related to the process of converting inputs into outputs. This improvement includes buildings, equipment, materials, work methods, and the performance and behaviors of workers (Abdel Nasser Alak Hafez, Hussein Walid Hussein Abbas, 2014, p. 14).

Continuous improvement is a management philosophy that aims to achieve mastery through improvements in processes and activities related to machines, materials, and individuals, as well as production methods (Othman Bilal, Abdullah bin Al-Dab, 2023, page 206).

Standard work

It is a procedure and a means to reduce waste, not to control individuals. It is a practical procedure and method, not a letter on paper. In many companies, it is a fixed document buried in drawers, but in lean management, it is a living system that is available and applied in the workplace (Sami Dhiab Mahal, 2021, page 86).).

Multi-functional workers

This concept refers to those with multiple, educated, specialized and trained skills who are able to study and understand the current reality in every activity and who are able to solve its problems and even develop it for the better, unlike

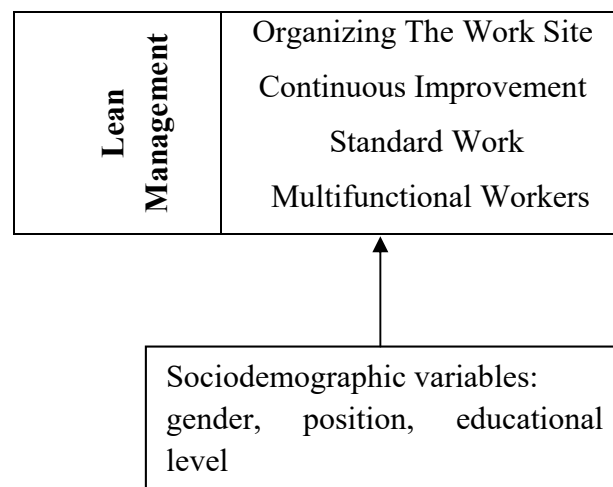
traditional management that relies on experienced people (Mahdi Omar, Hashemi Tayeb, 2019, p. 28).

3-The procedural aspect of the study

Study model:

The study model was built based on the study's literature and theoretical frameworks, and the following figure shows this:

Fig.1. Study model



Source: Prepared by the researcher based on the study's literature

Study population and sample:

The study population was represented by employees working at the Biokar Foundation - Ben M'hidi - El Tarf - where 80 questionnaires were distributed randomly, from which 70 questionnaires were retrieved suitable for statistical analysis.

Design and construction of the study tool:

The study form was designed and developed to measure the extent of achieving agile management requirements, after familiarity with various theoretical frameworks and study literature. The form included two axes, where the first axis represents the sociodemographic variables of the study sample members, while the second axis includes the dimensions of the study.

Study methods:

This study relied on the following methods:

- Frequencies and percentages to display results related to the sociodemographic characteristics of the study sample members;
- The arithmetic mean to know the level of each variable; The standard deviation measures the degree of dispersion in the answer values.

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- Cronbach's alpha reliability coefficient for the purpose of ensuring the validity and reliability of the study tool.
- Pearson correlation coefficient (to measure the construct validity between the dimensions of the study and the tool as a whole).
- One-sample t-test to study the availability of dimensions of the study variable;
- One way ANOVA test to measure significant differences in relation to the study variable.
- Five-point Likert scale: It is used to measure the sample members' degrees of agreement with the dimensions of the study, where the scale scores are as follows:

Table 1.Weights of the questionnaire items

Answer	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Weighted weight	1	2	3	4	5

Source: Muhammad Khair Salim Abu Zaid: Statistical analysis of data using SPSS (Version 15-16), Dar Safaa and Dar Jarir for Publishing and Distribution, Amman - Jordan, 2010, p. 27
- adapted.

Validity and reliability of the study tool:

Validity test:

The structural validity test of the study tool was conducted by calculating the correlation coefficients between the statements and dimensions of the study variable and the tool as a whole. The results are summarized in the following tables:

Table 2. Testing the structural validity of the studies' dimensions and statements

Ferries		Correlation	Sig
organizing the work site	Ferry 01	0.935	*0.000
	Ferry 02	0.893	*0.000
	Feery 03	0.804	*0.000
	Ferry 04	0.780	*0.000
	Ferry 05	0.787	*0.000
continuous improvement	Ferry 06	0.659	*0.000
	Ferry 07	0.634	*0.000

	Feery 08	0.738	*0.000
	Ferry 09	0.664	*0.000
	Ferry 10	0.665	*0.000
standard work	Ferry 11	0.716	*0.000
	Ferry 12	0.780	*0.000
	Feery 13	0.658	*0.000
	Ferry 14	0.538	*0.000
	Ferry 15	0.658	*0.000
multifunctional workers	Ferry 16	0.592	*0.000
	Ferry 17	0.612	*0.000
	Feery 18	0.603	*0.000
	Ferry 19	0.703	*0.000
	Ferry 20	0.793	*0.000

*Statistically significant at ($\alpha \leq 0.05$) **Statistically not significant

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

Table 3. Structural validity test of the study tool

Variables		Correlation	Sig
The tool as a whole	organizing the work site	0.805	*0.000
	continuous improvement	0.767	*0.000
	standard work	0.658	*0.000
	multifunctional workers	0.810	*0.000

*Statistically significant at ($\alpha \leq 0.05$) **Statistically not significant

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

We note from the aforementioned tables that most of the correlation coefficients for the study dimensions were high, and therefore we conclude that the questionnaire is characterized by a high degree of validity.

Stability of the study tool:

As for the reliability of the study tool, Cronbach's alpha coefficient was used to ensure reliability, and the results were higher than the accepted value of 0.60, which is shown as follows:

Table 4. Stability coefficient

The variable	number of items	Cronbach's alpha coefficient	reliability coefficient
Sociodemographic variables	-	-	-
organizing the work site	05	0.89	0.94
continuous improvement	05	0.69	0.83
standard work	05	0.66	0.81
multifunctional workers	05	0.67	0.81
Overall stability coefficient		0.86	0.92

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

Analysis of the characteristics of the study sample members:

Table 5. Sociodemographic characteristics of the study sample members

Variable	Categories	Frequency	Percentage
Sex	Male	37	52.85
	Feminine	33	47.14
	Σ	70	100
Work Position	Director	1	1.42
	Head of the Department	3	4.28
	Head of section	5	7.14
	Engineer	4	5.71
	Laboratory worker	25	35.71
	Packaging agent	20	28.57

	manager assistant	12	17.14
	Σ	70	100
Educational level	Secondary school or less	16	22.85
	professional	15	21.42
	University	37	52.85
	Σ	70	100

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

4- Questionnaire analysis:

Analyzing the extent to which the study sample members agree on the dimensions of the study

- Analysis of the extent to which the study sample members agree on the dimension of workplace organization

The following table shows the sample members' attitudes regarding the workplace organization dimension:

Table 6. Attitudes of sample members regarding the organization of the work site

The statement	mean	standard deviation	rank	degree of agreement
1- Management applies clear procedures and methods to organize the work site	4.36	0.48	1	High
2- Management emphasizes the arrangement and organization of the work site to facilitate tasks	4.33	0.50	2	High
3- Management ensures that the work site is cleaned and arranged according to requirements	4.31	0.50	3	High
4- The administration sets specific	4.25	0.57	4	High

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standards for organizing the work site				
5- Management emphasizes that workers respect the conditions for organizing the work site	4.28	0.55	5	High
General Average	4.30	0.52	-	-

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

We notice from the previous table that the phrase (management applies clear procedures and methods to organize the work site) came in first place, with a mean of 4.30 and a standard deviation of 0.52, which indicates that the viewpoints of the sample members do not differ, while the phrase that states (management sets specific standards for organizing the work site) ranked last. Work) with an arithmetic mean of 4.25 and a standard deviation of 0.57. This indicates the administration's commitment to implementing procedures for organizing the work site. In general, approval on this dimension was high with an arithmetic mean of 4.30 and a standard deviation of 0.52.

- Analysis of the extent to which the study sample members agree on the dimension of continuous improvement

The following table shows the sample members' attitudes regarding the continuous improvement dimension:

Table 7. Attitudes of sample members about continuous improvement

The statement	mean	standard deviation	rank	degree of agreement
6- Management emphasizes the need for improvement and development of work procedures	4.17	0.49	3	High
7- Management emphasizes training to develop employees' skills	4.15	0.48	5	High
8- Management emphasizes continuous performance evaluation to improve it	4.16	0.49	4	High

9- Management emphasizes that improvement includes all aspects of work	4.23	0.56	2	High
10- The administration emphasizes adopting modern management methods for the purpose of continuous improvement	4.26	0.54	1	High
General Average	4.19	0.51	-	-

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

We note from the previous table that the phrase (management emphasizes the adoption of modern administrative methods for the purpose of continuous improvement) ranked first with a mean of 4.26 and a standard deviation of 0.54, which indicates that the viewpoints of the sample members do not differ, while the phrase that states (management emphasizes the Training to develop employees' skills) with an arithmetic mean of 4.15 and a standard deviation of 0.48. This indicates the importance of continuous improvement for the continuity and maintenance of the organization in the right direction. In general, approval on this dimension was high with an arithmetic mean of 4.19 and a standard deviation of 0.51.

Analyzing the extent to which the study sample members agree on the standard work dimension

The following table shows the sample members' attitudes regarding the standard work dimension:

Table 8. Attitudes of sample members regarding standard work

The statement	mean	standard deviation	rank	degree of agreement
11- Management emphasizes developing work methods	4.43	0.49	3	High
12- Management emphasizes avoiding delays in completing tasks	4.41	0.53	5	High

13- Management works to create a work climate that allows tasks to be completed faster	4.19	0.55	4	High
14- Management precisely defines basic work procedures and abandons additional procedures	3.95	0.74	2	High
15- Management emphasizes following specific procedures to find solutions to problems in a timely manner	4.18	0.59	1	High
General Average	4.23	0.58	-	-

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

We note from the previous table that the phrase (management emphasizes the development of work methods) ranked first with a mean of 4.43 and a standard deviation of 0.49, while the phrase that states (management precisely defines basic work procedures and abandons additional procedures) ranked last with a mean of 3.95 and a standard deviation. 0.74. This indicates commitment to work procedures on time to achieve the organization's goals. In general, approval for this dimension was high, with an arithmetic mean of 4.23 and a standard deviation of 0.58.

Analysis of the extent to which the study sample members agree on the dimension of multi-functional workers

The following table shows the sample members' attitudes regarding the dimension of multi-functional workers:

Table 9. Attitudes of sample members regarding multi-functional workers

The statement	mean	standard deviation	rank	degree of agreement
16- Management emphasizes developing individuals' skills to enhance their abilities to fill several tasks	4.15	0.57	2	High

17- Management emphasizes breaking the routine by diversifying tasks	4.03	0.75	3	High
18- The administration sets training programs for new jobs	4.21	0.58	1	High
19- The administration emphasizes the process of job transfer to diversify tasks	3.86	0.88	4	High
20- Transferring the worker from one position to another helps increase his efficiency	3.81	0.85	5	High
General Average	4.01	0.72	-	-

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

We note from the previous table (the administration sets training programs for new jobs) ranked first with a mean of 4.21 and a standard deviation of 0.58, which indicates that the viewpoints of the sample members do not vary, while the last place was ranked by the statement that states (transferring the worker from one position to another helps increase his efficiency) with a mean of 3.81 and a standard deviation of 0.85. This indicates the diversity and multiple tasks of individuals, which will be reflected in their performance. In general, approval on this dimension was high with a mean of 4.01 and a standard deviation of 0.72.

5- Testing the study hypotheses

Testing the first main hypothesis:

The first main hypothesis states: “Lean management tools are not available in the enterprise under study from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$).”

This hypothesis is divided into the following sub-hypotheses:

The first sub-hypothesis:

H0: “The requirements for organizing the work site in the institution under study are not met from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)”

H1: “The requirements for organizing the work site in the institution under study are available from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)”

To test this hypothesis, one sample t-test will be used as follows:

Table 10. One sample t-test for workplace organization

Dimension	T value	Degree of freedom	Sig	Mean	Standard error
workplace organization	23.09	69	0.00	4.31	0.43

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

We note from the table above that the average value (4.31) is greater than the comparison value 3, and the calculated t value is greater than the tabulated one, and it is statistically significant (0.00) at the level of significance ($\alpha \leq 0.05$). On this basis, we accept the alternative hypothesis that site organization requirements are met. Work from the point of view of the study sample members.

The second sub-hypothesis:

H0: “The requirements for continuous improvement are not met in the institution under study from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$).”

H1: “The requirements for continuous improvement are available in the institution under study from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$).”

To test this hypothesis, one sample t-test will be used as follows:

Table 11. One sample t-test for continuous improvement

Dimension	T value	Degree of freedom	Sig	Mean	Standard error
continuous improvement	26.76	69	0.00	4.19	0.34

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

We note from the table above that the average value (4.19) is greater than the comparative value of 3, and the calculated t value is greater than the tabulated one, and it is statistically significant (0.00) at the level of significance ($\alpha \leq 0.05$). On this basis, we reject the null hypothesis and accept the alternative hypothesis that there is Requirements for continuous improvement from the point of view of the study sample members.

The third sub-hypothesis:

H0: “Standard work requirements are not met in the enterprise under study from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)”

H1: “Standard work requirements are available in the enterprise under study from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)”

To test this hypothesis, one sample t-test will be used as follows:

Table 12. One sample t-test for Standard Work

Dimension	T value	Degree of freedom	Sig	Mean	Standard error
Standard Work	25.42	69	0.00	4.23	0.347

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

We note from the table above that the average value (4.23) is greater than the comparative value 3, and the calculated T value is greater than the tabulated one, and it is statistically significant (0.00) at the level of significance ($\alpha \leq 0.05$), and on this basis we accept the alternative hypothesis that the time requirements of The point of view of the study sample members.

The fourth sub-hypothesis:

H0: “The requirements for multi-functional personnel in the institution under study are not met from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)”

H1: “The requirements for multi-functional workers in the institution under study are met from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$)”

To test this hypothesis, one sample t-test will be used as follows:

Table 13. One sample t-test for multi-functional personnel

Dimension	T value	Degree of freedom	Sig	Mean	Standard error
multi-functional personnel	15.23	69	0.00	3.96	0.49

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

We note from the table above that the average value (3.96) is greater than the comparative value 3A, and the calculated T value is greater than the tabulated one, and it is statistically significant (0.00) at the level of significance ($\alpha \leq 0.05$). On this basis, we reject the null hypothesis and accept the alternative hypothesis that there is Multi-functional requirements from the perspective of the study sample members.

Based on the above, we accept the main alternative hypothesis of the availability of agile management tools from the point of view of the sample members under study.

Testing the second main hypothesis:

The second main hypothesis states:

H0: "There are no statistically significant differences between the sample members' attitudes regarding agile management tools due to sociodemographic variables (gender, position, educational level) at the level of significance ($\alpha \leq 0.05$)."

H1: "There are statistically significant differences between the sample members' attitudes regarding agile management tools due to sociodemographic variables (gender, position, educational level) at the level of significance ($\alpha \leq 0.05$)."

Table 14 .Results of one-way anova to test the differences for the study sample's opinions about agile management tools

Variable	Source of Variation	Sum of Squares	Degree of Freedom	Mean Squares	F Value	Sig
Sex	Between groups	318.20	1	318.20	9.03	9.03
	Within groups	2042.73	68	35.22		
	total summation	2360.93	69			
Work Position	Between groups	66.19	3	22.06	0.53	0.53
	Within groups	2294.73	66	40.97		
	total summation	2360.93	69			
Educational	Between groups	111.11	3	37.03	0.92	0.92

level	Within groups	2249.81	56	40.17
	total summation	2360.93	59	

Source: Based on the results of data analysis of the study questionnaires using (SPSS v23)

From the previous table we conclude the following:

- There are significant differences between the sample members' attitudes towards agile management tools due to the gender variable, as the value of Fisher's coefficient reached (9.03), which is statistically significant (0.00) at the level of significance ($\alpha \leq 0.05$).
- There are no significant differences between the sample members' attitudes towards agile management tools due to the position variable, as the value of Fisher's coefficient was (0.53) and is not statistically significant (0.65) at the level of significance ($\alpha \leq 0.05$).
- There are no significant differences between the sample members' attitudes towards agile management tools due to the educational level variable, as the value of Fisher's coefficient was (0.92) and is not statistically significant (0.43) at the level of significance ($\alpha \leq 0.05$).

We note from the above that there are significant differences for gender and no significant differences for both position and educational level.

These results invite us to partially reject the null hypothesis and partially accept the alternative hypothesis that there are significant differences between the attitudes of the study sample members regarding agile management tools due to sociodemographic variables.

8. RESULTS And Conclusion

The study touched on the lean management tools applied at the level of the Biocar's Foundation - Al-Tarf - from the point of view of the individuals working under the study, and this was by studying their attitudes and the extent of their agreement with its dimensions. The study concluded with the following results: The sample members' agreement on the workplace organization dimension is high, with an arithmetic mean of 4.30 and a standard deviation of 0.52.

This confirms that the procedures for organizing the work site are well followed. The sample members agreed on the continuous improvement dimension to a high degree, with an arithmetic mean of 4.19 and a standard deviation of 0.51. This confirms the importance of continuous improvement to enhance performance in the organization.

The sample members' agreement on the standard work dimension was high,

with an arithmetic mean of 4.23 and a standard deviation of 0.58. This confirms the completion of tasks and various procedures in the time specified for them.

The sample members' agreement on the dimension of multi-functional workers is high, with a mean of 4.01 and a standard deviation of 0.72. This confirms the diversification of individuals' tasks at the organization level.

- The requirements for organizing the work site are available from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$);
- Provides requirements for continuous updating from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$);
- Availability of time requirements from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$);
- The availability of multi-functional requirements from the point of view of the study sample members at the level of significance ($\alpha \leq 0.05$);
- There are significant differences for agile management tools due to the gender variable.
- There are no significant differences for agile management tools due to the variables of position and educational level's results.

Study suggestions:

Based on the above, we review some proposals as follows:

- Opening up a space to discuss various work-related problems;
- Listening to employees' opinions and taking them into account;
- Empowering workers and partial participation in making some decisions;
- Conducting awareness-raising meetings to discuss various administrative concepts;
- Resorting to foreign experts in preparing training programs to improve the quality of employees' performance;

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