


Relationships between work ethics and green management: a case study of Shiraz public hospitals

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Abstract

Introduction: Work ethic and green management are crucial issues in the health sector. This study was conducted to design a model on the relationship between work ethic and green management in public hospitals in Shiraz.

Methods: Mixed method (qualitative-quantitative) was used in the present study. The statistical sample in the qualitative section to answer the Delphi questionnaire included professors of medical universities and managers of public hospitals in Shiraz. The statistical sample in this section was obtained to be 15 people by using snowball sampling. The statistical population in the quantitative section included 200 staff of Shiraz public hospitals. They selected by stratified sampling method. Data collection tools included Delphi questionnaire and structural equation questionnaire. The quantitative section analysis was performed by SPSS and AMOS software.

Results: Based on the results of the Delphi method, 8 main components and 29 sub-components were identified: among them, 4 main components were related to work ethic and 4 main components were related to green management. The results of structural equations showed that the factor loads of green management components including waste management, green human resources, productivity and energy were 0.41, 0.73, 1.09 and 0.60, respectively. Also, the factor loads of work ethic components including dependence, ambition, considerations and cooperation were 0.65, 0.81, 0.89 and 0.75, respectively. Work ethic also affected green management by 0.40.

Conclusion: Work ethic affects green management. Health and human considerations in the workplace and ambition in work, productivity and green human resources were the most important components.

Keywords: Ethics, Institutional; Health; Hospitals, Public; Organization and Administration.

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Introduction

Nowadays, management is considered a science that requires new technologies in this field in line with development in human knowledge

(1). In recent years, due to continuous destruction of the environment, achieving the goals of sustainable development and green improvement in the protection of

natural resources and the environment has become more important (2-4).

One of the topics considered by managers is green management and its design. Many companies have implemented green management strategies to meet environmental protection requirements (5).

Green management is a set of executive management tools that its realization will increase productivity at the level of organizations and companies and ultimately at the national level (6).

The most fundamental problem facing human beings today is the environmental crisis. Nowadays, the importance of nature and the environment is not limited to its lovers, but everyone is aware of the importance and vital role of nature in human life. Since existence is a single body, damage to any part is considered damage to the whole body. Thus, man should accept that any kind of damage to nature leads to destruction. Since hospitals are one of the most important sectors of energy consumption in the country, implementation of green management system in hospitals will play an effective role in reducing resource consumption (such as water, energy, paper and solid waste management) and will lead to improved productivity (7).

Also, ethic and social responsibilities of managers have been considered more than ever by management experts. Researchers have an agreement on the role of ethic in all aspects of the organization and its impact on the efficiency and effectiveness of the organization. Ethical behavior has a significant impact on the activities and results of the organization, because it increases productivity, improves communication and reduces risk (8).

Studies show that despite the adherence of predecessors to green ethic, work ethic is a new issue in the studies and work ethic and

its do's and don'ts have not yet been significantly considered (9).

After a thorough review of the theoretical foundations and thematic literature, the dimensions of green management were examined and it was concluded that each of these dimensions has different levels. Productivity dimension includes optimal use of resources, sustainable development, culture and education. Energy dimension includes optimal energy consumption, observance of consumption patterns, and responsibility of managers. Waste management dimension includes waste segregation and enforcement of rule and regulations and monitoring and green human resources dimension includes green performance appraisal, green service compensation, and green hiring (10).

Several factors are involved in productivity, but among these factors, human resource plays a key role. The effectiveness of human resource depends on work ethic. If they find work troublesome and useless and avoid it, it will not possible to achieve productivity by relying on such people. In line with the objectives of the present study, the dimensions of green management were examined in various studies and its theoretical foundations and thematic literature were considered, which results in the following dimensions:

- 1- Productivity
- 2- Energy
- 3- Waste management
- 4- Green human resources

Work ethic itself is manifested as an internal organizational phenomenon that is influenced by two categories of factors: The first category includes factors that are outside the workplace such as family, school, media and personal characteristics and the person base. The second category is the factors that are in the workplace such as the position of the person in the workplace, the type of management and its style, work

organization (physical space of the workplace, work environment conditions, regulation of human relations), and internal factors such as motivation and motivational areas (11).

In 1995, Geregory C. Petty outlined four dimensions for the work ethic that have been used in many domestic and foreign. These dimensions are:

1. Work dependence and interest
2. Work ambition and perseverance
3. Human and healthy work considerations
- 4-Work cooperation

Regarding the component of work ethic, among sociological theories, Marxist theories indirectly refer to work ethic more precisely. In these theories, production is considered as an independent variable and self-alienation as a dependent variable. However, self-alienation of individuals can have a direct impact on the level of interest, accuracy, responsibility, initiative and productivity. As noted, ethic is the rules and areas that motivate and activate the mental, psychological, and physical commitment of the individual or group. A self-alienated mind cannot provide appropriate conditions for ethical and physical motivation and commitment (12).

Regarding the relationship between work ethic and green management, Akhtar et al., showed that consumers' environmental ethic has a positive effect on green consumption (13). Guo et al., concluded that work ethic in the companies led to improved green management (14). Domínguez-Gómez et al., showed that ethic leads to sustainability, green management and increased efficiency in the organization (15). Li et al., also found in their study that entrepreneurial orientation and ethical issues in the organization lead to the promotion of green management in start-ups (16).

Given the domestic and foreign research literature regarding two variables of work ethic and green management and the issues and theories expressed about these variables, work ethic was examined as an independent variable and green

management was examined as a dependent variable in this study. This issue is more important in Iran's hospitals due to the issue of health and its many wastes and contaminants. In the absence of work ethic in hospitals, the issue of waste disposal is not done properly, which imposes many risks to the environment and public health. Also, a limited number of studies has been conducted on the impact of work ethic on green management and none of these studies has been conducted qualitatively and quantitatively. Therefore, the present study was conducted to design a model of work ethic with green management in public hospitals in Shiraz.

Methods

In the present study, the mixed method was used. The mixed research method is a combination of quantitative and qualitative methods. Two types of research methods can be used effectively in research (17). Using one of the research methods (quantitative and qualitative) reveals and analyzes only limited aspects of a phenomenon, and in this case, other aspects of the phenomenon are ignored (18).

Thus, the use of mixed research method provides a clearer picture of social and behavioral phenomena. The present research is applied in terms of aim and descriptive-survey in terms of data collection method. In the qualitative section, the components of work ethic and green management were identified by library studies and then the validity of the extracted components was examined by the Delphi method.

The statistical population in the qualitative section to answer the Delphi questionnaire included professors of medical universities and managers of public hospitals in Shiraz. The statistical sample was obtained to be 15 people using snowball sampling method. The qualitative section was performed in Excel software. In the quantitative section, the components identified in the qualitative section were examined by a 5-point Likert

scale questionnaire and confirmatory factor analysis.

The statistical population in the quantitative section to answer the questions of the questionnaire included staff of Shiraz public hospitals. According to the status of hospitals and the prevalence of coronavirus disease, public and teaching hospitals were selected by a stratified sampling method and each hospital as a class was randomly selected. Among these classes, five hospitals of Hafez (n=75), Khalili (n=34), Namazi (n=166), Ayatollah Dastgheib (n=55), and Hazrat Zeinab (n=85) were randomly selected and a statistical sample was selected in proportion to this number from each hospital.

Finally, the statistical population of 200 people was selected by stratified sampling method using Morgan and Krejcie table. Kaiser, Meyer, Olkin (KMO) criterion was used to ensure the validity of the data and to check the accuracy of sampling before factor analysis. Bartlett sphericity test also showed that the variables were related and the results of factor analysis were reliable. According to the results, the KMO value for sampling quality was 0.718, which was an acceptable value and due to the significance of Bartlett test (value ($p < 0.05$), the necessary conditions for factor analysis were provided.

For the green management questionnaire, the eigenvalue of each factor and the explanatory factor of variance of that factor were given in organizational factors. Cronbach's alpha was used to measure the reliability of work ethic and green management questionnaires. Cronbach's alpha coefficient for work ethic questionnaire and green management questionnaire was obtained at 0.928 and 0.977, respectively, and according to the values of Cronbach's alpha coefficient, it could be inferred that the research tool has a good reliability. The quantitative section

analysis was performed by SPSS and AMOS software.

Results

In this study, the content of all collected articles was first reviewed and finally a total number of 32 components were identified for work ethic and green management. Then, Delphi method was used to examine the validity of the extracted components. After the Delphi method, a questionnaire was used to test the model of work ethic and green management in Shiraz public hospitals. Then, the results of the qualitative and quantitative sections were presented separately.

Qualitative section

To ensure that the components identified by library studies were real, to reach a consensus on the main components and sub-components, to evaluate the validity of the model, to design the final model and qualitative validation of the model, the Delphi technique was used. The steps and results of the Delphi technique have been presented. After identifying the components related to the qualitative section, the Delphi questionnaire was designed to obtain the opinion of experts on their level of agreement with the identified components. Then, the Delphi questionnaire was submitted to the experts. The questions were scored on a 5-point Likert scale (5=very high, 4=high,

Table 1. Demographic characteristics of the statistical sample in the qualitative section

Demographic characteristics	Characteristic type	N	%
Gender	Female	7	47
	Male	8	53
education	Master	3	20
	PhD	12	80
Employment history	Under 5 years	0	0
	Between 5 and 10 years	0	0
	Over 10 years	15	100

Source: Research findings

3=moderate, 2=low and 1=very low). Also, the demographic characteristics of the experts are presented in (Table 1).

According to the results, among the study experts, 7 were female, 8 were male, 3 had master degree and 12 had PhD degree, except for two experts, all had more than 10 years of employment history. The survey was conducted in several stages to achieve the consensus of experts on the components. The identified components in the qualitative phase were presented to 15 experts in the form of a questionnaire. Then, the mean of the answers was calculated using Excel software. The purpose of the Delphi method was to reach

the highest consensus on a specific topic by using a questionnaire and consulting experts and often according to their feedback. This process continued until the mean of the numbers becomes adequately stable. The minimum mean value of answers in this study is 3.5. If the mean of the answers is less than 3.5, the relevant component would be eliminated. The results of the Delphi method are presented in (Table 2).

In the first Delphi stage, the identified components were presented to the experts in the form of a 5-item Delphi questionnaire and the mean of the answers was calculated.

Table 2. First, second and third rounds of Delphi

Row	Main components	First round		Second round		Third round	
		Mean	SD	Mean	SD	Mean	SD
1	Productivity	4.18	0.258	4.27	1.298	4.18	0.992
2	Optimal use of resources	4.09	0.236	3.81	0.889	3.90	0.558
3	Sustainable development	4.09	0.269	4.27	0.269	4.18	0.798
4	Culture	4.18	0.214	4.36	0.541	4.27	0.158
5	Education	4.18	0.425	4.27	1.298	4.18	0.774
6	Bank loans	3.45	0.328	-	-	-	-
7	Observing consumption patterns	4	0.236	4.09	0.236	4	0.933
8	Accountability of managers	4	0.528	4.18	0.923	4.18	0.854
9	Waste segregation	4.18	0.236	4.27	0.236	4.18	1.015
10	Law enforcement and monitoring	4.18	0.968	4.36	0.912	4.27	0.598
11	Green performance appraisal	3.72	0.528	4	0.910	3.90	0.527
12	Green service compensation	3.72	0.258	4	1.021	3.90	0.817
13	Green Hiring	3.72	1.025	3.81	1.059	3.72	0.258
14	Energy	4	0.256	4.09	0.256	4	0.236
15	Waste management	3.63	0.112	3.81	0.850	3.72	0.256
16	Green human resources	4.36	0.108	4.45	0.108	4.36	0.558
17	Optimal energy consumption	4	1.139	4.18	0.235	4.09	0.936
18	Disclosure of environmental information	3.63	0.702	3.45	0.741	-	-
19	Dependence and interest in work	3.90	1.21	3.90	0.223	3.81	0.854
20	Perseverance and ambition in work	4.18	1.120	4.09	0.852	4	0.889
21	Healthy and humane consideration in workplace	4	0.110	3.90	0.553	3.90	0.968
22	Collective spirit and cooperation in work	4	0.887	4.18	0.887	4.09	1.104
23	Teamwork	3.72	0.558	3.90	0.863	3.81	0.111
24	Motivation to work	3.81	0.258	4	0.514	3.90	1.230
25	Work effort	3.90	0.302	4	0.598	3.90	0.770
26	Building friendly relationships	3.81	0.339	3.90	0.301	3.81	0.1/269
27	Willingness to work in the organization	3.72	0.450	3.90	0.336	3.81	0.396
28	Take work seriously	3.54	0.528	3.81	0.667	3.72	0.807
29	Creating favorable relationships	3.90	0.487	4.18	0.83	4.09	0.528
30	Common goals at work	3.36	0.774	-	-	-	-
31	Survey of employees	3.72	0.778	3.81	0.665	3.72	0.469
32	Participating in decision making	3.63	0.889	3.81	0.790	3.72	0.774

Source: Research findings

At this stage, the mean of the answers provided for the components of bank loans and common goals at work was less than 3.5, so these components were removed from the process. Kendall's agreement coefficient at the first stage was 0.569, indicating that the level of agreement among experts at this stage is moderate.

At the second stage of Delphi, the Delphi questionnaire was submitted to the experts

again and the mean of the answers as well as the difference between the means of this stage and previous stage were calculated. At this stage, the mean component of environmental information disclosure was less than 3.5, so this component was also removed and the third round of Delphi was performed. Kendall's agreement coefficient at the second stage was 0.590, indicating that the level of agreement among experts at this stage is moderate.

Table 3. Final main components and sub-components along with validity and reliability

Variable	Dimensions	Component	Validity (CVR index)	Reliability (Cronbach's alpha)
Green management	Productivity	Optimal use of resources	0.51	0.76
		Sustainable Development		
		Culture Education		
	Energy	Optimal energy consumption	0.52	0.75
		Observing consumption patterns		
		Accountability of managers		
	Waste Management	Waste segregation	0.52	0.74
		Law enforcement and monitoring		
	Green Human Resources	Green performance appraisal	0.53	0.74
		Green service compensation		
Green hiring				
Work ethic	Dependence and interest in work	Motivation to work	0.55	0.76
		Willingness to work in the organization		
	Perseverance and ambition in work	Work effort	0.55	0.80
		Take work seriously		
	Healthy and humane considerations in the workplace	Building friendly relationships	0.56	0.82
		Creating favorable relationships		
	Collective spirit and cooperation in work	Survey of employees	0.51	0.80
		Teamwork		
Participating in decision making				

Source: Research findings

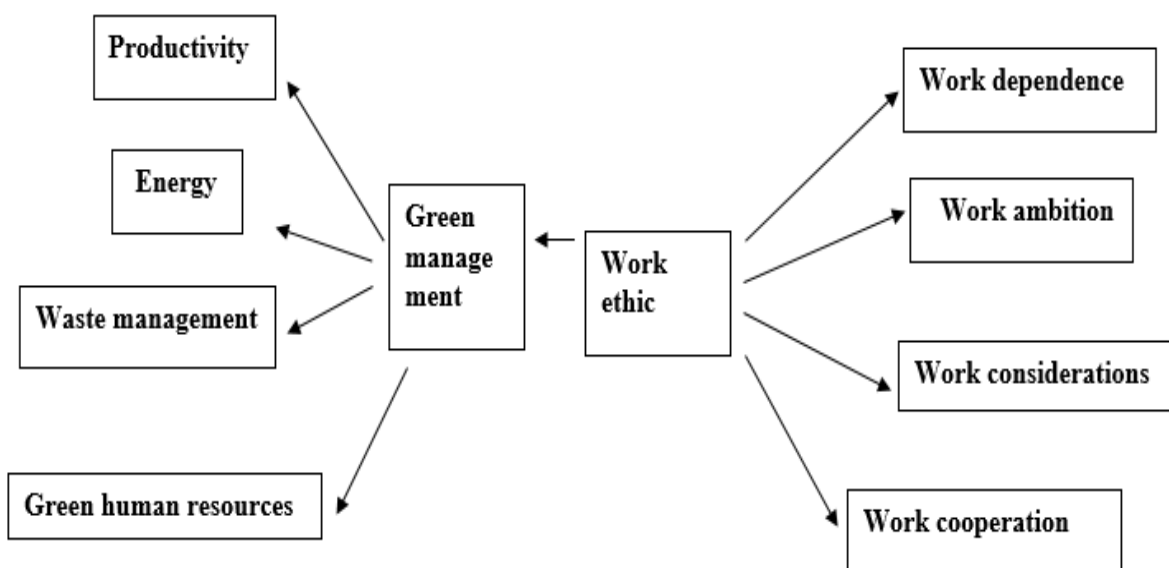


Figure 1. Conceptual model of research

In the third round, the mean of all identified components was higher than 3.5. Also, the Kendall's agreement coefficient at the third stage was 0.690, indicating that the level of agreement among experts at this stage is almost high. Thus, all indicators that entered the third round of Delphi (29 components) were evaluated by experts at appropriate level and they were approved. According to the results obtained from the Delphi method, 8 main components and 29 sub-components were identified for the two variables of work ethic and green management that 4 main components were related to work ethic and 4 main components were related to green management.

The final model of the research is based on the main components and sub-components of work ethic and green management along with the validity and reliability of the components are shown in (Table 3).

Given the number of experts, the CVR content validity index was approved. Also, Cronbach's alpha coefficient in all components was above 0.7, indicating the acceptable reliability of the components of the questionnaire. Therefore, the conceptual model extracted from the qualitative section, which was the

relationship between work ethic and green management, is shown in (Figure 1). In the quantitative section, the proposed model was used to test the model.

In the quantitative section, the demographic characteristics of the statistical samples were examined, as shown in (Table 4). According to the results, most of the statistical samples in this section were female, had bachelor's degree and an employment history of between 5 to 10 years. Then, the normality of the distribution of the questionnaire data was examined by Kolmogorov-Smirnov test.

Table 4. Demographic characteristics of the statistical samples in the quantitative section

Demographic characteristics	Characteristic type	N	%
Gender	Female	110	55
	Male	90	45
Education	Diploma and associate	13	6.5
	Bachelor	152	76
	Master	18	9
	PhD	17	8.5
Employment history	Under 5 years	74	37
	Between 5 and 10 years	65	32.5
	10 to 15 years	31	15.5
	15 to 20 years	18	9
	20 to 25 years	12	6

Source: Research findings

According to this test, the probability level of test statistics in all questions is above 5% and so null hypothesis of normality of data distribution is accepted.

At the next stage, since the data is distributed normally and the statistical sample size is 200 people, to test the conceptual model of the research, confirmatory factor analysis, structural equations modeling or SEM and Amos software were used. Here, the goodness of fit indices, including GFI and AGFI, RMSEA, X^2 , NFI, and CFI indices are used to assess the validity of the model. According to the results obtained from modeling and software, the values of GFI, IFI, TLI and CFI indices are higher than 0.9.

Therefore, these indices show an acceptable fit of the model. RMSEA values are also 0.079, which indicates an acceptable fit of the model. In total, all the mentioned indices confirmed the fit of model. Therefore, the structural model of the research is appropriate in terms of fit indices and all the

proposed factors can be included in the structural model of the research. After confirming the fit of model, confirmatory factor analysis or structural equations were estimated.

(Figure 2), shows the standard form of the structural equation model. Also, the value of factor loads and their significance (t-statistic) are reported in (Table 5).

According to the results, all factor loads of work ethic and green management components are significant at the 5% probability level. Therefore, the factor loads of green management components including waste management, green human resources, productivity and energy are 0.41, 0.73, 1.09 and 0.60, respectively. Also, the factor loads of work ethic components including dependence, ambition, considerations and cooperation were 0.65, 0.81, 0.89 and 0.75, respectively. Also, work ethic has an effect on green management with a value of 0.40, which is also statistically significant.

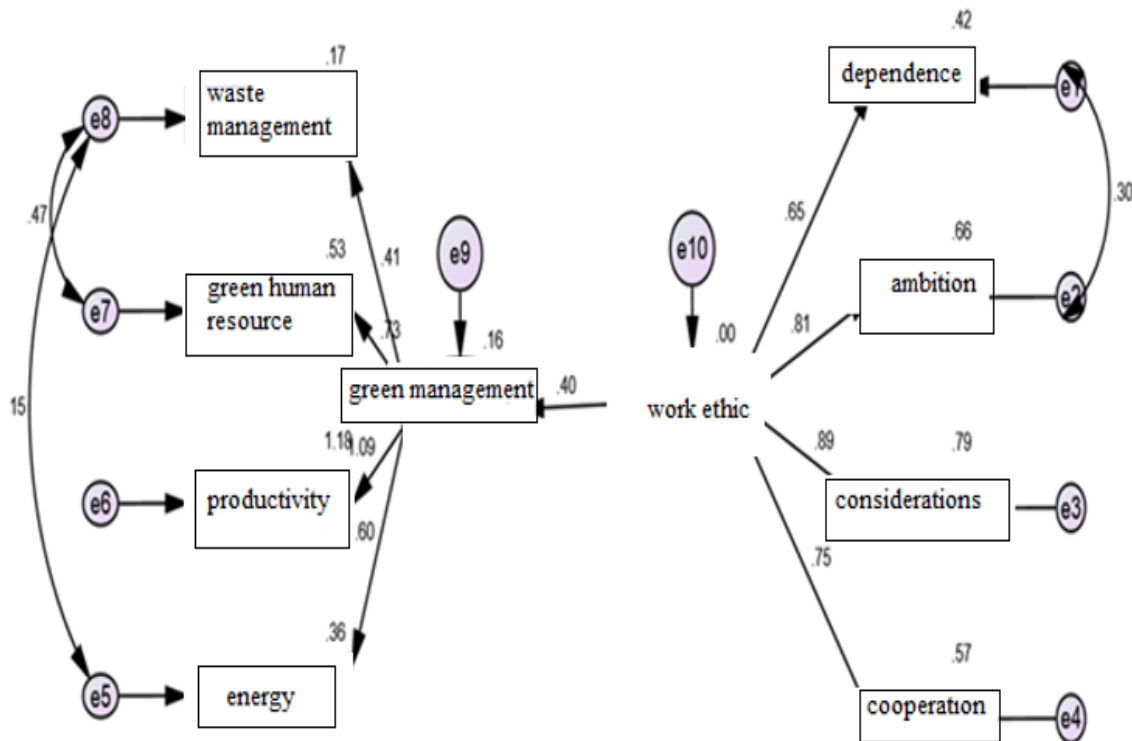


Figure 2. Structural equation model of research (Source: Research findings)

Table 5. Factor loads and significance of research components

Variable	Component	Standard operating load	T statistic	sig
Green management	Productivity	1.09	8.782	0.00
	Energy	0.60	13.018	0.00
	Waste management	0.41	12.890	0.00
	Green human resources	0.73	1.486	0.00
Work ethic	dependence and interest in work	0.65	15.012	0.00
	Perseverance and ambition in work	0.81	34.372	0.00
	Healthy and humane considerations in the workplace	0.89	45.039	0.00
	Collective spirit and cooperation in work	0.75	36.627	0.00
Total	The impact of work ethic on green management	0.40	2.178	0.02

Source: Research findings

To assess the validity of the model, it was distributed among 30 experts and its results were tested using a single sample t-test. As shown in (Table 6), one-single t-value (19.000) was obtained that with a confidence interval of 0.99 and an error of less than 0.01, there is a significant difference between the real mean and the theoretical mean. According to the table, the real mean (4.5833) is higher than the theoretical mean (3). Therefore, it can be concluded that the model has a good validity.

Discussion

Due to the continuing destruction of the environment in recent years, achieving the goals of sustainable development and green improvement in the protection of natural resources and the environment has become more important. Based on the research literature, to improve the level of green management, work ethic in the organization can be effective. This study was conducted in two qualitative (Delphi) and quantitative (confirmatory factor analysis) sections. In the qualitative section, 8 main components

and 29 sub-components were identified for the two variables of work ethic and green management that 4 main components were related to work ethic and 4 main components were related to green management. The components of green management included productivity, energy, waste management and green human resources and the components of work ethic included dependence in work, ambition in work, healthy and humane considerations in the workplace and collective spirit and cooperation in work.

In the quantitative section, the results showed that work ethic affects green management by 0.40. Thus, work ethic does not play a significant role in affecting green management. Among the components of work ethic, healthy and humane consideration in the workplace and ambition at work, and among the productivity and green human resources were the most important components. In explaining the results of this study, it should be noted that green management is one of components of green management,

Table 6. Model status based on experts' opinion

	Theoretical mean	mean	SD	Statistic t	P value	Lower bound	Upper bound	Status
Model	3	4.5833	0.50000	19.000	0.000	1.4142	1.7525	Desirable

the most important aspects of environmental human resource management systems and is a vital part of any organization. In other words, to achieve a competitive advantage, it is necessary to adopt appropriate basic strategies. The success of these strategies is directly associated with the appropriate actions and decisions. In this process, high level of awareness of staff in this regard and their responsibility bring greater success for an organization (19).

Thus, staff work ethic can justify this issue and show a direct relationship with green management. As shown in the results of the present study, if staff have the components of work ethic such as dependence in work, ambition in work, healthy and humane consideration in the work, and collective spirit and cooperation in work, green management will be realized in the organization.

In other words, green management requires people who have dependence and interest in the work and necessary motivation to prepare for the implementation of environmental issues. Staff with perseverance and ambition in work will be responsible for ensuring green management in the organization. Paying attention to commitment and cooperation among staff and creating healthy and humane consideration in the workplace can be very effective in creating and maintaining green management strategies. Also, according to the results of Garzella and Fiorentino, paying attention to the structure of systems through cooperation and creating open and free communication for organizational forces can provide green human resource management in the organization, as the results of the present study showed that cooperation in work affects the green management (19).

Also, in explaining the results of this study, it should be stated that green management

is a combination of management goals regarding the environment and human resources processes that one of the important items of it is work ethic of staff. In the processes related to human resources and staff of organizations, processes of recruiting hard-working people, training and development of human resources, health and job security, performance management, appraisal, talent management, rewarding and professional and job planning, productivity of human resources are considered.

On the other hand, the goal of green management is to make the organization's human resources aware of the environment. To reduce pollution caused by provision of services, it is essential to protect the environment. In green management, according to its components, creating duties and responsibilities based on protection and attention to the environment in each job and the use of teamwork to implement the environmental goals of the organization are considered, seen in the work ethic of organization staff. Therefore, the results of this research can be justified based on these cases.

Analysis of statistical data obtained from review of the proposed conceptual model indicates the confirmation of the model. The general results of the relationships in the model are consistent with the results of studies conducted by Petty and Hill, Vedadhir et al., Akhtar et al., Guo et al., Domínguez-Gómez et al., Li et al.

According to the obtained results, it is recommended for managers of public hospitals pay special attention to healthy and humane considerations in the workplace and perseverance and ambition in work to be able to use work ethic more and better in increasing green management. For this purpose, it is necessary to provide peace of mind for staff in an organization atmosphere to establish healthy and

humane consideration along with spirituality among the hospital staff.

Also, it is recommended for the managers encourage the staff to be persevere and ambitious in their work by giving reward for them in line with goals of the hospital to achieve green management. Also, to achieve green management and its implementation, it is recommended for hospital managers increase productivity, including workforce productivity and capital productivity by empowering the workforce and using high-quality capital. Also, green human resources by training the workforce, rewarding the workforce for cooperating with green production and the sustainable development of hospitals should be considered in this regard.

Conclusion

No study has been conducted on the relationship between work ethic and green management and health and medical centers. In other words, the present study conducted on this issue for the first time. Most of effective components have been applied according to opinions of experts and specialists. Hence, the present study results can be generalized to other hospitals in Iran, and even other centers, including universities and other organizations, based on type of their performance, can use results of this study. However, it should be noted that many indicators might be included or excluded in their studies based on type of work that opinion of experts and specialists were considered in the present study.

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Authors' Contributions: All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting

the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

Ethical Considerations: This study designed based on Helsinki declaration. All participants entered the study after informed consent. Their data considered confidential and any personal information did not publish or spread anywhere.

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