

## The effects of implementing family physician program on occupational health indicators in Hamadan province, Iran

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### ABSTRACT

Health indicators are used for health management and planning. Since the family physician program was implemented in 2005 with the aim of improving health indicators and enhancing the referral system, it is necessary to assess the progress of this program by evaluating the related health indicators. The present study aimed to assess the effects of implementing family physician program on occupational health indicators in Hamadan Province, Iran.

This cross-sectional study recruited all rural workshop workers covered by the family physician program. In order to examine the effects of implementing family physician program on occupational medicine and health indicators, the indicators were compared in two periods, 4 years before and 10 years after the implementation. Data were also collected by researchers through the provincial health department. Finally, data were analyzed and assessed by SPSS software using linear regression test and descriptive statistics.

The implementation of family physician program had a significant effect on indicators of occupational health examinations in small workshops ( $P = 0.001$ ) and rural workshops with less than 20 workers ( $P = 0.001$ ), and musculoskeletal disorders indicators among workers in rural workshops ( $P = 0.002$ ), and led to increasing growth of those indicators. The family physician program in rural areas improved occupational health indicators. Finally, it is concluded that this program can promote occupational health indicators, particularly occupational health examination indicators.

**Keywords:** Family physician, Occupational health examinations, Health indicators.

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### Introduction

Health has always been the core of social, economic, political and cultural development in all human societies and has held an important place in the development of infrastructures in different sectors of all societies. Considering that

health is a basic human right, it is upon the governments to provide just and equitable healthcare (1). The ultimate goal of the healthcare system in any country is to improve its public health through enabling equitable access

to healthcare services for the entire society (2). Equal access to healthcare services has always been of interest to researchers throughout the world (3). In the past two decades, given the failure to properly respond to the health needs and expectations of the public, healthcare systems in both developed and developing countries have had to implement reform programs (4). Currently, in many regions of the world, including North America, Western Europe and Canada, the family physician is at the core of health service provision and healthcare teams (5). According to section B of Article 91 of the fourth economic, social and cultural program of the country, necessary measures should be taken to establish a health insurance policy with the centrality of the family physician and one that incorporates a referral system by the end of this program (6). The implementation of the family physician program began in Iran in late 2005 with the aim of enabling easy and equal access to standard health services in different urban and rural areas; currently, 6000 billion Rials are dedicated to this program (7). In Iran, health services have a share of only 7.6% of the GDP, while this indicator is about 12% on average in developed countries (8). In this program, the family physician is the principal member of the healthcare team whose main duty is to actively provide primary healthcare services (9).

According to Article 92 of the Labor Law, annual occupational health examinations are mandatory for all employees; the Center for Environmental and Occupational Health has therefore developed regulations and guidelines for these examinations so that they can be equally performed across the country and so that all employees are covered by them to the greatest extent possible (10).

Given the presence of family physicians in rural and urban areas and the existing policy to further increase their presence, with adequate training, occupational examinations can be partly performed by this group of physicians, and a larger population of the country can thus benefit from occupational health examinations (10).

Evaluation of health system performance is highly important; first, it provides a means of identifying flaws within the system, and second, it develops indicators for evaluating the health system over time. Both these achievements can in turn help create a reservoir of evidence for the acceptance or rejection of specific health system policies (including financial methods or models of providing health services). In the meantime, the efficacy and equity of health services and the access to them can be assessed by studying the inputs, processes and immediate outputs of health interventions. In evaluating health system performance, assessing the impact of health system processes may provide valuable information (11).

Although many studies have been conducted on the effect of implementing the family physician program on certain health indicators, no studies have yet examined the effect of this program on professional and occupational health indicators, and the few studies on the subject have been conducted in other health departments, which are briefly discussed in this article.

Considering the management significance of occupational examination programs in the healthcare system of the Ministry of Health and the inclusion of these indicators as part of the general health indicators established by the Ministry of Health, and also given the insistence of this ministry on improving these indicators in provincial health departments, and given the

implementation of the family physician program in the country from 2005 and the lack of evidence on the effects of this program on the discussed indicators, it is necessary to assess the managerial effect of the family physician program on these indicators since the implementation of the program, and management reforms may need to be made in the program in order to improve these indicators in case they are proved to be unfavorable or declining. The results of this study on the evaluation of health system performance provide valuable information on the effects of these health system processes.

The medical examination of employees before and during service is a requirement of any occupational healthcare system and makes up part of secondary disease prevention. As recommended by OSHA and NIOSH (12), these examinations are currently performed in many industries, manufacturers, workshops, public organizations, etc. Occupational examinations seek to determine the employees' general health, the prevalence of occupational and other non-communicable diseases, the employees' physical and mental compatibility with the job offered and the preparation of basic health information for the next comparative evaluation (13). Employees' illness imposes heavy costs on the society in three general categories, including direct costs, such as medical and rehabilitation costs, indirect costs, such as the costs associated with the loss of production and efficiency, and non-material costs, such as pain and suffering and the disruption of the family (14). There is a lack of accurate statistics on employees' illness in Iran, but the total cost imposed by occupational diseases in the United States has been estimated at 171 billion dollars (15). According to Article 92 of the Labor Law, the employees of all the units subject to

Article 85 of the Employees Act who are exposed to work-related diseases depending on their type of work require medical records and should be examined by health centers and undergo any necessary tests at least once a year and their test results should be recorded in corresponding records. Given all the discussed issues, the occupational examination of workers is a responsibility of the Ministry of Health and all family physicians are required to perform employee examinations and follow up on work-related illnesses in workers covered under the family physician program by their health centers (16). Since the family physician program began in Hamadan Province concurrently with the rest of the country in 2005 and since this province has been providing healthcare services within the framework of the guidelines provided by the Ministry of Health and Medical Education, and given that, according to their job description, family physicians are responsible for giving occupational health examinations to employees and following up on their work-related illnesses, after about 10 years since the implementation of the program in this province, the researchers decided to study its effect on occupational health indicators and occupational medicine.

Moreover, this duty has also been elaborated in the family physician job description in this program. Since the implementation of the family physician program in Iran (2005), no studies have yet examined its effects on occupational health indicators; given the importance of this subject and its relevant indicators as part of general health indicators, the present study was conducted in 2015 to investigate the effect of the implementation of the family physician program on occupational health indicators as determined

by employee examinations from the date of implementation to the present.

## Materials and Methods

The present descriptive cross-sectional study with a pre-post design was conducted on the statistical population of all the rural workers covered by the family physician program. A comparative study of occupational health indicators as determined by employee examinations was conducted from 2001 to 2014 over two separate periods; first, a four-year period from 2001 to 2004 before and second, a ten-year period from 2005 to 2014 after the implementation of the family physician program. Data on the population covered by the program were extracted by health workers and experts from health centers and then recorded as occupational health indicators in the annual statistical forms of employee examination and occupational medicine. The required data were collected by the researcher through the Hamadan Province Health Department.

The present study compared the mean values of five indicators associated with the employee examination and occupational health program before and after the implementation of the family physician program; for each indicator, the mean value over the four years leading to the implementation of the program (2001-2004) was compared to the mean value over the ten years following the implementation of the program (2005-2014). The data obtained were analyzed by

SPSS using linear regression and descriptive tests.

## Results

The mean value of occupational health indicators as determined by employee examinations in Hamadan province over the years 2001-2014 was 28.76% in domestic workshops and 35.47% in workshops with less than 20 employees. The mean identified prevalence of work-related illnesses was 2.86% for hearing disorders, 3.59% for musculoskeletal disorders and 1.29% for pulmonary disorders. Given the total of 14 years studied before and after the implementation of the family physician program and since Hamadan Province has nine counties, the total number of cases studied was obtained by multiplying 14 by 9, equaling 126, as shown in Table 1.

The mean value of occupational health indicators as determined by employee examinations before the implementation of the family physician program was 17.55% in domestic workshops and 21.67% in workshops with less than 20 employees. The mean identified prevalence of work-related illnesses was 1.82% for hearing disorders, 2.09% for musculoskeletal disorders and 0.86% for pulmonary disorders. The total number of cases studied (n=36) was obtained by multiplying the number of counties (n=9) by the number of years surveyed from before the implementation of the program (n=4); (Table 2).

**Table 1.** Occupational health indicators as determined by employee examinations in Hamadan Province from 2001 to 2014

Indicator	Count	Mean	SD*
Percentage of examination in domestic workshops	126	28.76	15.50
Percentage of examination in workshops with less than 20 employees	126	35.47	18.25
Identified percentage of hearing disorders	126	2.86	6.15
Identified percentage of musculoskeletal disorders	126	3.59	3.53
Identified percentage of pulmonary disorders	126	1.29	2.22

\* SD=Standard Deviation

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The mean value of occupational health indicators as determined by employee examinations after the implementation of the family physician program was 33.25% with a standard deviation of 14.57 in domestic workshops and 40.98% with a standard deviation of 18.56 in rural workshops with less than 20 employees. The mean identified prevalence of work-related illnesses was 3.27% with a standard deviation of 7.06 for hearing disorders, 4.19% with a standard deviation of 3.25 for musculoskeletal disorders and 1.47% with a standard deviation of 2.51 for pulmonary disorders among the rural workers. The total number of studied cases (n=90) was obtained by

multiplying the number of towns (n=9) by the number of years surveyed from after the implementation of the program (n=10); (Table 3).

The mean value of occupational health indicators as determined by employee examinations was 17.55% before and 33.25% after the implementation of the family physician program in domestic workshops and 21.67% before and 40.98% after the implementation of the program in workshops with less than 20 employees. The identified prevalence of hearing disorders among the rural workers was 1.82% before and 3.27% after the implementation of the family physician program. The identified

**Table 2.** Occupational health indicators as determined by employee examinations in Hamadan Province before the implementation of the family physician program

Indicator	Count	Mean	SD*
Percentage of examination in domestic workshops	36	17.55	11.7
Percentage of examination in workshops with less than 20 employees	36	21.67	6.38
Identified percentage of hearing disorders	36	1.82	2.61
Identified percentage of musculoskeletal disorders	36	2.09	3.77
Identified percentage of pulmonary disorders	36	0.86	1.17

\* SD=Standard Deviation

**Table 3.** Occupational health indicators as determined by employee examinations in Hamadan Province after the implementation of the family physician program

Indicator	Count	Mean	SD
Percentage of examination in domestic workshops	90	33.25	14.57
Percentage of examination in workshops with less than 20 employees	90	40.98	18.56
Identified percentage of hearing disorders	90	3.27	7.06
Identified percentage of musculoskeletal disorders	90	4.19	3.25
Identified percentage of pulmonary disorders	90	1.47	2.51

\* SD=Standard Deviation

**Table 4.** Occupational health indicators as determined by employee examinations before and after the implementation of the family physician program

Indicator	Indicator Value		P-Value
	Before the Family Physician Program	After the Family Physician Program	
Percentage of examination in domestic workshops	17.55	33.25	0.001
Percentage of examination in workshops with less than 20 employees	21.67	40.98	0.001
Identified percentage of hearing disorders in the workshops	1.82	3.27	0.21
Identified percentage of musculoskeletal disorders in the workshops	2.09	4.19	0.002
Identified percentage of pulmonary disorders in the workshops	0.86	1.47	0.147

prevalence of musculoskeletal disorders was 2.09% before and 4.19% after the implementation of the family physician program among the rural workers. The identified prevalence of pulmonary diseases was 0.86% before and 1.47% after the implementation of the family physician program among the rural workers (Table 4).

## Discussion

The present study showed an increase in the percentage of workers covered by occupational examinations in domestic workshops after the implementation of the family physician program. The linear regression analysis showed that the implementation of the family physician program increased the percentage of employee examination in domestic workshops significantly ( $P=0.001$ ). The present findings are consistent with the results obtained by Jabbari-Beirami et al. (17), Alae-Ardekani et al. (18) and Barati et al. (19).

The present study also showed an increase in the percentage of workers covered by occupational examinations in workshops with less than 20 employees after the implementation of the family physician program. The linear regression analysis showed that the implementation of the family physician program increased employee examinations significantly in workshops with less than 20 employees ( $P=0.001$ ). The present findings are consistent with the results obtained by Raesi et al. (20), Mansourian et al. (21), Khadivi et al. (22) and Ghanbari-Jahromi et al. (23).

The linear regression analysis also showed that the implementation of the family physician program had no significant effects on the percentage of cases of hearing disorder identified among the workers ( $P=0.213$ ). These

findings agree with the results obtained by Ahadi et al. (24).

The linear regression analysis also showed that the implementation of the family physician program increased the percentage of cases of musculoskeletal disorder identified in the rural workers significantly. These findings are consistent with the results obtained by Arabnejad et al., who found this program to have had a significant increasing effect on the identification of patients with mental disorders ( $P<0.05$ ) (25).

In another study, Sadeghi et al. showed that the implementation of the family physician program has had a significant effect on the identification of patients with pulmonary tuberculosis (26).

Eskandari et al. examined the effect of the implementation of the family physician program on 52 health equity indicators and concluded that this program improves these indicators (27).

In one study, Hassanvandi et al. reported the role of family physicians in identifying mental disorders in rural and urban areas of Dargez town as positive and showed that the implementation of the family physician program contributes to the detection of cases of mental disorder (28).

The linear regression analysis also showed that the implementation of the family physician program had no significant effects on the percentage of cases of pulmonary disorder identified among the rural workers ( $P=0.147$ ).

The present findings are consistent with the results obtained by a number of other studies. For example, in one study, Sadeghi et al. reported the role of family physicians in identifying diabetic patients as positive before and after the implementation of the family

physician program and emphasized that this program contributes significantly to the identification of these patients (26). In another study, Alaei et al. showed that the indicators of health services management in rural areas improved significantly after the implementation of the family physician program (13). Jabbari-Beirami et al. reported that the implementation of the family physician program has had a positive effect on family health indicators (17).

## Conclusion

The implementation of the family physician program significantly increased all the five indicators of occupational health as determined by the examination of workers in domestic workshops and workshops with less than 20 employees and as determined by the cases of hearing, musculoskeletal and pulmonary disorder identified among rural workers in Hamadan Province; this program thus significantly affected occupational health indicators as determined by employee examination in domestic workshops and in workshops with less than 20 employees and the identification of musculoskeletal disorders among the rural workers.

The implementation of the family physician program can improve occupational health indicators, especially as determined by occupational health examinations. The discussed indicators will further improve if certain flaws in the program are resolved.

## Conflict of Interest

The author Declare no conflict of interest.

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