



## Evaluation of the Ergonomic Management in Health Houses of Arsanjan City in 2023

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### Abstract

**Introduction:** Health care workers are frontline service providers who play a vital role in maintaining and improving health community. They may be injured due to poor ergonomics in the work environment, disrupting the provision of optimal health care. Ergonomic management can protect these workers from irreversible complications. For this reason, the present study aimed to investigate ergonomics management in health houses in Arsanjan city.

**Methods:** This qualitative study was conducted in 1402, where 11 participants were selected by purposive sampling. The data collection method was semi-structured interviews with health workers working in health centers over the phone. Data analysis was done using qualitative content analysis with coding.

**Results:** Four main contents were identified: "The state of education, The state of demographic variables, The state of equipment, and The state of work environment of health workers working " and 20 sub-themes. This study shows that the ergonomic conditions of the work environment were favorable in most of the health houses and unfavorable in some of the old health houses. Most of the health workers did not know about the correct ergonomics of using the computer, the sitting position, and touching the mouse, but they reported favorable conditions regarding the ventilation condition, the appropriate size of the door, the exit location, and the presence of some equipment.

**Conclusion:** Therefore, given that the lack of sufficient training is the most important known ergonomic problem, this study suggested that managers of health houses hold annual training courses on ergonomics in the workplace and that the evaluation of ergonomics is one of the monitoring priorities of policymakers and managers.

**Keywords:** Health workers; Work environment, Ergonomics management



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### Introduction

Currently, occupational injuries are now the third leading cause of death in the world and the second in Iran (1). In Iran, the statistics from the Social Security Organization show that there were 98,621 cases of disability as a result of occupational injuries, of which 25,070 cases were total and partial disability caused by work (2).

It is noteworthy that the most common cause of occupational injuries was the lack of ergonomic work management. Ergonomics is a science that seeks to create a relaxing and safe environment for employees by designing equipment and adjusting environmental conditions while establishing a balance between the employees

and the work environment (3). This science seeks to find solutions to improve the way work is done, work methods, work tools and equipment, and their compatibility with the psychological and physical characteristics of human beings (4).

In Iran, the most environmental level of providing primary health care delivery is the health houses, which are managed by health workers (5). Health workers are multi-professional service providers who have sufficient skills to deliver health services, particularly in the fields of reproductive health and disease care, and environmental health (6, 7).

Healthcare workers are not exempt from occupational risks related to the work environment, and one of the most effective ways

to reduce occupational risks related to the work environment is to pay attention to the ergonomics of the work environment (8).

For health workers to perform effectively, they must be provided with a safe working environment (9). One of the safety dimensions of the work environment is to pay attention to the principles of ergonomic work management (10).

Ergonomics management is an inseparable part of physical health; studies have found that the layout of the workplace is an essential organizational factor in the body condition of employees(11), the use of office equipment(12), the use of office chairs, the environmental conditions of the workplace (13), the way the body is positioned during work (14), the workplace equipment such as the chairs used by health workers, and the environmental conditions of the workplace have a direct effect on their general health (15, 16).

The correct implementation of ergonomics in work environments with long working hours, low mobility, and poor posture can prevent musculoskeletal and psychological problems among workers (3). The health and safety of workers, particularly those working in health centers, is important in achieving a balance between different aspects of physical, social, mental, spiritual, and emotional life at work (17, 18). The general health and working environment conditions of disabled health workers directly affect their behavior and reactions in the work environment (19).

However, due to their permanent residence in the village, crossing difficult roads, the lack of amenities, and the lack of proper ergonomic equipment, they sometimes suffer from skeletal and muscular problems (20). This leads to job burnout and mental and emotional problems (21). Various factors such as age, poor posture, performing repetitive movements and gender can cause injuries caused by improper ergonomics (22).

The ergonomics of the work environment is one of the most important issues in increasing productivity and improving the performance of health centers; however, it should be noted that although observing the principles of ergonomics reduces the work pressure and fatigue caused by it (23), ignoring the principles of ergonomics and neglecting them in the workplace leads to high costs for society, employers, workers, and their families, ultimately reducing the workers'

efficiency, motivation, and health (24).

In a study conducted by Moharrami et al (2023) to observe adverse outcomes among healthcare workers in relation to their occupational hazards in Gonabad, the results showed that some job characteristics and risks affect workers, especially women, and cause some complications (25).

This is the fact that health houses, as important public facilities in cities and public places, play an essential role in maintaining the health and safety of a person, and the presence of ergonomic problems in health houses can lead to the discomfort of employees and ultimately affect the health and safety of its employees. Therefore, this study was designed and implemented to examine ergonomic management in health houses in Arsanjan city in 2023.

## Methods

The current study is a qualitative study of thematic analysis of qualitative content with the coding method, and the research environment in this study was Arsanjan city (Fars province).

### Participants

The statistical population of this study consisted of 32 people working in health centers covered by comprehensive health centers in Arsanjan city, Fars province. The participants were selected by purposive sampling. In this method, the researcher used participants in the research who had rich experience with the subject under study and were willing to participate in the research. The number of participants was determined based on data saturation so that after 11 interviews, no new stratum was formed.

### Data Collection

The collection tool in this study was a semi-structured interview guide sheet and note-taking in the field. The method of collecting information was conducting semi-structured interviews with health workers in the health centers covered by comprehensive health centers in Arsanjan city, Fars province.

After introducing himself, the researcher obtained permission to make a phone call via SMS, and, during the phone call, he explained the research objectives and the conditions of the interview (the duration of the interview, purpose of conducting the interview, and reassurance regarding maintaining confidentiality in the

storage of information). If the participants were willing and satisfied, the time of the interviews was arranged over the phone with the participants' consent. A reminder message was sent two hours before the scheduled interview time.

At the same time, the interview was conducted by telephone. The interviewee was free to hang up the phone for any reason at any stage of the interview and, if he or she wished, another time to continue the interview was arranged with his or her consent.

With the consent of the participants, the telephone interview was recorded. The interviews started with some general questions (sample interview question: introduce yourself, to find out the demographic situation of the employees, are you familiar with workplace ergonomics, to find out the state of knowledge about workplace ergonomics, name your workplace equipment) and based on the participants' answers, further follow-up questions were asked along these lines (such as explain a little more, please give an example) and taking notes in the field and recording reminders according to the principle of saturation. Each interview lasted between 45 and 60 minutes.

### *Data Analysis*

The recorded interview information was transcribed carefully. Finally, the data was analyzed using qualitative content analysis with a coding method. First, the entire interview text was carefully read to gain a general understanding of the data. Then, the target text was read several times. The specified semantic units and primary codes were extracted manually, and these codes were classified into subclasses and classes according to relationships, similarities, and differences (26).

### *Trustworthiness and Rigor*

Lincoln and Goba's four criteria of reliability, validity, transferability, and verifiability were used to ensure the accuracy and scientific rigor of the material presented (27). A specialized educational team (including an expert, a doctor, and a professor in the field of healthcare management) was used to review the findings. In addition to semi-structured interviews, note-taking during the interviews was also used to validate the data. The initial findings of this study, along with initial codes and categories, were presented to a

sub-sample of participants to elicit their opinions and feedback (member survey), and some parts of the data were reviewed by colleagues who were not involved in this study.

To determine the reliability of the findings, we used the opinions of an external observer, this observer was a researcher familiar with ergonomics and qualitative research methods, but he was not a member of the research team. Determining the possibility of confirming the findings, all activities were recorded, and a report of the research process was prepared; to determine transferability, we discussed the results with two faculty members whose positions and experiences were comparable to the participants, and the results were reconfirmed.

### *Ethical Considerations*

Ethical approval for the present research was obtained from the Ethics Committee of Marvdasht Azad University (IR.IAU.M.REC.1403.014). When the participants were informed about the objectives of the research and asked to give their consent for the interviews, they were assured that the information collected would remain confidential. They were also informed that they could withdraw from the study at any time and that there would be no negative consequences for them.

### *Results*

Table 1 presents the participants' demographic information. In this study, 11 participants (9 females and 2 males) aged 23-54 years were interviewed. The mean age of the subjects was 40.27 years. The mean work experience of the participants was 14.09 years.

In the process of data analysis, 4 main dimensions (the state of education, the state of demographic variables, the state of equipment and the state of work environment of health workers working in the health houses covered by comprehensive health houses in Arsanjan city, Fars province) and 7 themes categories (problems related to conducting face-to-face training, problems related to virtual training, socio-demographic variables of health workers (affecting the occurrence of ergonomic problems related to work), lack of equipment or unfamiliarity of health workers in using equipment, location of health houses, and size of health houses) were identified; also 20 sub-themes was extracted (Table 2).

**Table 1:** Demographic information of the research participants

Participants	Gender	Age	Work experience	Education level
1	Female	41 years	17 years	Associate degree
2	Female	50 years	29 years	Diploma degree
3	Female	29 years	6 years	Diploma degree
4	Female	34years	6 years	Associate degree
5	Female	36 years	3 years	Associate degree
6	Female	37 years	5 years	Diploma degree
7	Female	45 years	17 years	Associate degree
8	Male	44 years	15 years	Associate degree
9	Female	50 years	27 years	Diploma degree
10	Female	23years	1 years	Bachelor in health care
11	Male	54 years	29 years	Diploma degree

**Table 2:** Main Content, Themes, and Sub-Themes affecting Ergonomic Management in Health Houses

Main Content	Themes	Sub-Themes
The state of education	Problems related to conducting face-to-face training	Lack of educational materials Low number of training sessions Short duration of training The remoteness of the training place (in terms of distance) Lack of vehicle and lack of service for commuting to pass the training course
	Problems related to virtual education	Weakness of the internet or disruption of connecting and Disconnecting the class internet Lack of clear educational content
The state of demographic variables	Social-demographic variables of health workers (influencing the occurrence of work-related ergonomic problems)	Age Gender Education Household composition Periodic examinations
The state of equipment	Factors related to health workers	Lack of familiarity of the health workers in using the available equipment: how to sit, how to work with a computer, mouse, how to stand correctly, how to sit correctly, lifting objects, medicine packages
	Factors related to the organization	Lack of proper facilities (such as lack of cooling and heating devices)
The state of work environment	Factors related to the location of health houses	On the outskirts of the village and away from people Close to agricultural land (smell of animal manure...) Noise pollution Commute route
	Factors related to the structure of the health house	The smallness of some old health houses Lack of warehouse to store medicines

*The State of Education*

One of the aspects of improving work ergonomics is attention to health workers and their training, which can be easily taught by holding training sessions.

Since this group, as the first job category in health centers, has spent a lot of time with people and has an important task in prevention and control of diseases, the spread of infectious agents, primary care for pregnant women and infants, routine care for the middle-aged and elderly, prevention of epidemics of infectious diseases, they control the health of the environment, control the drinking water condition of the

villagers, and pay attention to their condition; this not only improves the health of the employees as part of the work organization but also leads to the improvement of the health condition of the residents covered by the health houses.

In this regard, one of the health workers announced:” *Ergonomics trainings were conducted once in face-to-face and once in virtual form last year. According to this expert, the number of training was low, and there was a need for more training in this field.*” (participant 2)

*The State of Demographic Variables*

Demographic variables of patients, variables

such as age, gender (female), education, household composition, and periodical examinations from the point of view of patients can affect the ergonomic management of health homes.

During his interview, one of the health workers stated: *“Older health workers or health workers with more Work experience years have more problem, including back pain and neck discs, leg and knee problems, etc., and it is caused by years of working in these conditions and long-term sitting. Also, they sometimes have to stand for long periods of time, and younger patients have fewer problems in this regard.”* (participant 7)

*“Another health worker said female health workers have more musculoskeletal problems than me.”*(participants10)

*“The length and width of the desks are not suitable. In addition, there is no footstool under the table and the legs are hanging.”* (participant 3)

### *The State of Equipment*

Another challenge identified during the interview with the health workers was related to equipment management; one was related to those who did not know enough about how to sit correctly; how to work with a computer and mouse; and how to stand correctly, lift objects or medicine packages. The other class that was obtained was the lack of proper facilities in the health centers.

*“Regarding equipment such as chairs, the chair is relatively suitable and flexible, but the chair of some people does not have a proper back and needs to change the chair or use medical backs.”*(participant 6)

### *The State of the Work Environment*

Another aspect of workplace ergonomics is related to the type of building and its location, by considering the budget or changing the location of old healthcare buildings can be avoided work-related ergonomic problems.

*One of the health workers said in his interview: “One of the health houses, due to its location in the middle of agricultural land, has the problem of pollution and unpleasant smell caused by spraying agricultural land, and a lot of dust in some months of the year.”* (participant 11).

*“The commuting route of some health houses is not paved, and this issue is especially problematic during the rains and commuting on foot is difficult.”* (participant 5).

## **Discussion**

The present study is the first qualitative study conducted on the ergonomic management status of health workers working in health houses in Arsanjan city, Fars province. The results of this study showed that all the workers were dissatisfied with the awareness of workplace ergonomics and training. This finding was consistent with the results of various studies such as Man et al. (28), Sama et al. (29), and Newkanen et al. (30). These previous studies found that lack of awareness was one of the most effective factors in workplace ergonomics problems and that many of these problems could be prevented by providing training and health interventions. The study by Robertson and her colleagues also found that ergonomics training increases knowledge of correct work ergonomics and also increases work productivity (31).

Mahmoud and her colleagues also confirmed that teaching computer users ergonomic principles, in addition to improving individual ergonomic behaviors, can be very effective in reducing pain in different parts of the body (32). Health workers have a great responsibility and play an important role in the health of the villagers, so it is necessary to pay attention to this group. Training sessions can prevent the occurrence of sports-related problems such as musculoskeletal problems, intervertebral disc problems, neck pain, and knee pain.

The results of this study showed that another aspect of workplace ergonomics is related to the type of building and location of health house. It is necessary for the health authorities, such as the University of Medical Sciences. By considering the budget or changing the location of the old health houses can be avoided work-related ergonomic problems.

This finding was consistent with the results of the study by Rafii Menesh et al. (2023) (33). Similarly, it was consistent with the results of the study carried out by Haqit et al. (34).

The results of the present study showed that during the interviews with the health workers and considering the demographic variables of the health workers, variables such as age, gender (female), education, household composition and regular examinations from the health workers' point of view may affect the ergonomic management of health houses.

The health worker stated the older the health

care worker is, the more ergonomic problems occurred for him. Thus, it is necessary to adopt some policies such as accelerating the retirement process of the elderly and replacing new forces. This finding was consistent with that of the study by Fouad et al. (2024), indicating age as a cause of musculoskeletal disorders among Egyptian anesthetists (35). In addition, the study by Maroufi and her colleagues confirmed that the severity of neck pain increased with the nurses' age (36).

Moreover, the interview with health workers showed that female gender was also introduced as a factor for the occurrence of ergonomic problems from the health workers' point of view; female health workers face more ergonomic problems such as back pain, knee pain, and neck pain, compared to male health workers. Given that female gender is also a factor that cannot be changed, it is necessary to provide educational interventions for this group and prevent the occurrence of work-related consequences. These interventions are recommended to start at the beginning of the work and be repeated periodically.

Based on the results of this study, another challenge identified by the researcher during the interview with health workers was related to equipment management, i.e. how to sit correctly; how to work with a computer and mouse; how to stand correctly; how to lift objects; and how to increase knowledge about drug packs.

Another category obtained was the lack of proper facilities in the health centers; for example, some staff introduced the lack of footrests in the centers, which causes the feet to hang and leads to problems related to leg ergonomics for health workers. This finding is consistent with the results of the studies by Pakzad et al. (2021), (37) and Fadai et al. (2022) (38). These researchers introduced the lack of equipment as one of the most important factors affecting the occurrence of musculoskeletal disorders. Also, Choobineh et al. showed that the prevalence of musculoskeletal disorders was higher among employees who used computers; the causes of these disorders were related to the use of a mouse, inappropriate height of the chair handle, and inappropriate placement of the monitor (39).

Health care workers, as the first job category in health centers, spend a lot of time with people and have an important task in prevention and control of diseases, spread of infectious agents, primary care

for pregnant women and infants, routine care for the middle-aged and elderly, and prevention of epidemics of infectious diseases. They control the health of the environment and the drinking water of the village residents. Paying attention to their condition not only improves the health of employees as part of the work organization but also leads to improvements in the health of the residents covered by the health homes.

### Limitations

This study faced several limitations. First, some health workers were unfamiliar with the interview process, which led to hesitancy in sharing their experiences. Second, time constraints limited the depth of participation from some workers, potentially affecting the richness of the data. Future research could benefit from a larger sample size and extended data collection periods to provide more comprehensive insights.

### Conclusion

This study showed that the ergonomic condition of the work environment was favorable in most of the health houses and unfavorable in some of the old health houses; at the same time, most of the patients did not know how to work with the computer, sit correctly at the desk and how to hold the mouse, but as to the condition of ventilation, the appropriate size of the door, the location of the socket and the presence of some equipment, the health workers reported a favorable situation. Therefore, given that the lack of sufficient training is the most important ergonomic problem identified in this study, it is suggested that regular and comprehensive ergonomic training programs should be held and the workers should be equipped with the necessary skills and knowledge to increase their well-being and productivity.

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### Ethics Approval

This study has been approved by Azad University of Marvdasht Branch, (IR.IAU.M.REC.1403.014).

## Conflict of Interest

There are no conflicts of interest.

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