



## **Avicenna the First to Describe Diseases Which May Be Prevented By Exercise**

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### **Abstract**

In the modern medical era it has been known as well that physical activity and exercise are important factors to prevent from different chronic diseases. Scientifically, there are numerous evidence based studies about protective role of exercise against chronic diseases such as cardio- respiratory diseases, diabetes, and hyperlipidemia etc, which have been completely explained. Historically, ancient physicians such as Avicenna had described this topic several hundred years ago. However, ancient principles of medicine are too different in comparison with modern medicine and description of diseases which Avicenna has talked about them and their managements are too much different, yet reviewing the protective role of sports and physical activity in his masterpiece, "The Canon of Medicine", reveals that Avicenna has made a significant contribution to the evolution of following knowledge. The present review discusses Avicenna's opinion about protective role of exercise against some diseases through a comparison with modern medical views and also emphasizes aspects that need further investigation for these opinions to be useful in clinic in the future.

**Keywords:** Avicenna, Exercise, Diseases, Prevention

### **Introduction**

Exercise is introduced as important factor to reduce chronic disease risks. Prevention of chronic diseases is a necessity in clinical sport and exercise medicine (1). "Avicenna", the great ancient Iranian physician, in his masterpiece, "The Canon of Medicine", introduced as an essential medical encyclopedia and divided to five books (2), described subjects about hygiene and health preservation and promotion and disease prevention. One of the most important factors to get this aim is "Exercise". Exercise which he called "Riazat" has been described in the first book, third

craft, second teaching and chapter one, pp229-234 of the Arabic Canon. According to his viewpoint if exercise is used correctly, intermediately and in an appropriate time, it can prevent from some diseases. Exercise creates heat in body which helps defecating of wastes out of body and enriches digestion to digest food completely so it results in preventing from accumulation of accessory materials or undigested substances in body. In this chapter, Avicenna also has described some diseases which can be produced because of physical inactivity (3). This study discusses about diseases

which, according to Avicenna's viewpoint, could be prevented by exercise but how exercise prevents from diseases is not the aim of this study.

## Method

Qualitative research, phenomenology type, was the method of study. According to study's aim, subjects about diseases, which may be prevented by exercise, were gathered from Avicenna's book, "The Canon of Medicine" as sample of study. Then, subjects were classified and read out repeatedly, so main themes were created. Finally, "content analysis" was used for data analysing. Content analysis in qualitative research is a perspective method to describe data as a code and then interpretation of codes as themes and finally, presentation of a comment from the text (4).

## Results

After investigating of data, one main theme with five secondary ones were found. The main theme was: "Materialistic diseases" with five secondary themes included: "Imtela which means Filling", "O'ram that means Inflammation", "Sui' a Mizaj that means dystemperament", "fever" and "Soul impairment".

### Materialistic diseases

Based on teaching of Avicenna, exercise could prevent from diseases which are created by some materials which he named them as "materialistic diseases". In this group of diseases, one or more materials include accessory and defecating products (wastes and undigested substances) accumulate whether in whole or in a part of body and result in some difficulties. Due to accumulation of defecating materials in body, five abnormal situations may occur:

1- "Imtela": It means "filling". Access materials can fill free spaces inside tissues and/or inside a duct; For example, in vessels they may cause obstruction and result in infarction. Obstruction of vessels especially arteries and in particular arteries of "chief organs" (heart, brain and liver) is too

dangerous. Such obstruction in other spaces may result in other difficulties such as a kind of epilepsy and also an especial form of stroke which appears due to filling of brain's ventricles with materials or wastes.

2- "O'ram": It means "inflammation". If materials move in body and descend to another organ, they may cause inflammation. According to Avicenna's viewpoint, inflammation is either soft or hard; for example, a reason for swollen, erythematous, painful and warm joint, may be a "soft inflammation"; whereas a cancerous mass can be a "hard inflammation"; however, there are some differences between "cancerous inflammation" and "hard inflammation"; for example, in opposite to cancer, hard inflammation can decline the sensation of organ. Actually, cancer is a special kind of inflammation. Sometimes, inflammation may be occurring in internal organs such as liver; and sometimes it offers external organs such as joints.

3- "Sui' a Mizaj": It means "dystemperament" (change in whole body or an organ temperament). Vulnerability of Mizaj<sup>1</sup> altered temperament which is called dystemperament (*Sui' a Mizaj*) leads to several different types of diseases. Sometimes it is caused by abnormal materials and waste products' quality dominance. If matters' temperament becomes warm or cold, bodies' temperament will shift to be warmer or colder than normal. This condition in brain is too dangerous and may result in some psychotic states.

4- Fever: Prolonged persistence of abnormal materials and waste products may produce an unnatural heat in body and creates infection and fever. There are several causes and interesting classification for fever in Canon. Some types of fevers causes after filling of spaces inside body either generally or locally, with waste so inactive physically individuals may suffer from fever because of two reasons: Infection and Imtela.

5- "Soul impairment": Receiving unhealthy vapour from the accumulated matters and waste products to "soul", leads to "soul impairment" which may result in special diseases such as some psychotic states (3).

## Discussion

Study's data indicate that according to Avicenna's teaching there are several diseases caused due to physical inactivity. Approximately, there is a relation between all diseases that may be prevented by exercise and accumulation of abnormal materials. In modern medicine, various diseases which are prevented by exercise have been known as well, for example coronary heart disease, stroke, hypertension, metabolic syndrome and cancer (5). Some of these problems are similar to Avicenna's opinion such as coronary obstruction (6). Of course, nowadays preventive role of exercise against breast cancer is well-known. Exercise role to prevent from stroke has been known but which kind of stroke that may be prevented by exercise is not so clear (5) while this study tell us that strokes which are created due to "Imtela" may be prevented by exercise. It is interesting that some abnormal conditions have been explained in Canon of Medicine which can be prevented by exercise while there was not enough similar evidence about them in modern investigations such as fever. There are some evidence about protective role of exercise against epilepsy (7) and hepatitis (8) but they recommend more investigations to be sure. According this study, if epilepsy occurs following of "Imtela" and hepatitis introduces as an O'ram, exercise may prevent against both of them. There are some diseases which are not raised today such as various kinds of "dystemperament" and "soul impairment"; Both "Brain dystemperament" and "Soul impairment" may results in some psychotic states. Today, it has been known that exercise could promote level of functions in schizophrenic patients (9). May regular exercise in childhood prevent from occurring of schizophrenia as "Brain dystemperament" or "Soul impairment" in teen years? It is necessary to know that all five groups of diseases that were indicated in this study have been described in a specific chapter in Canon of medicine exhaustively and each one includes numerous diseases either are today well-known such as stroke or modern medicine is not familiar with them such as "soul impairment" and fever

due to "Imtela". May "Imtela" be introduced as a reason for fever with unknown origin (FUO)?

## Conclusion

The presented remarkable examples of diseases which may be prevented by exercise in the Canon of Medicine tell us that ancient physicians such as Avicenna were familiar with preventive role of exercise as well. Some diseases, which in new medicine exercise plays an important protective role against them, have been described by Avicenna theoretically without any paraclinical helps and only on the basis of principles of Iranian traditional medicine. To use his theories, the first step is to acclimatize diseases in modern medicine with traditional medicine ones. For example, it is possible, easy, safe and low-cost to get an exact observation from epileptic patients by a traditional medicine physician in order to find signs of Imtela according to Avicenna's viewpoint and separates patients who present that signs. The next step is study about efficacy of preventive role of exercise against seizure in detected group. Investigations about other abnormal status from which exercise may prevent, according to Avicenna's viewpoint, are suggested.

## Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc) have been completely observed by the authors.

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## Appendix

1. Temperament which introduced as "*Mizaj*" in Iranian Traditional Medicine texts is a quality which is a consequence of mutual interaction of the four contradictory primary qualities (Hot, Cold, Wet, Dry). Briefly, Mizaj means the dominant quality of the composite object (3).

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