

# Rehabilitation Ethics Codes in English-Speaking Countries: A Narrative Review

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## Review Article

### Abstract

**Introduction:** Rehabilitation of people with disability has ethical dimensions. Therefore, the aim of this study was to review the codes of ethics for rehabilitation in English-speaking countries through a narrative review.

**Materials and Methods:** In this study, the ethical codes in Australia, Canada, the United States, and the United Kingdom were searched electronically through the google search engine, because the language was understandable for researchers. Accordingly, the codes of ethics for rehabilitation (including Orthotics and Prosthetics, occupational therapy, and physiotherapy) were extracted and studied by two researchers independently.

**Results:** A set of professional responsibilities for the rehabilitation services were categorized according to four principles of biomedical ethics and presented as ethical codes for rehabilitation services.

**Conclusion:** As the first step in developing a reliable framework for professional ethics, professional ethics codes for rehabilitation in Australia, Canada, the United States, and the United Kingdom were reviewed through a narrative review, in order to provide the basis for professional ethics in rehabilitation services based on Iranian Islamic teachings.

**Keywords:** Rehabilitation, Professional autonomy, Beneficence, Non-maleficence, Justice, Code of ethics

**Citation:** Sadeghi-Demneh E, Forghany S. **Rehabilitation Ethics Codes in English-Speaking Countries: A Narrative Review.** J Res Rehabil Sci 2018; 14(4): 248-56.

Received date: 06.07.2018

Accept date: 21.09.2018

Published: 07.10.2018

### Introduction

Rehabilitation is a set of measures with the ultimate goal of improving the quality of life (QOL) and promoting social participation of individuals with regard to their physical, mental, social, and spiritual aspects and is comprised of one of the three levels of health service provision to the general public (1). Based on the predictions by the World Health Organization (WHO), 15% of the population each country is the people with mild, moderate, and severe disabilities. Accordingly, there are over 11 million people in need of rehabilitation services in Iran (2).

Rehabilitation for people with disabilities includes numerous ethical dimensions. Professional ethics or professionalism comprises a set of desirable individual or group behaviors and attitudes that lead to the provision of desirable services to the clients (3). In medical professionalism, it is necessary for the rehabilitation practitioner to prioritize the client needs and interests over the personal needs and interests. The professionalism-oriented behaviors and decisions are formed based on the ethically sound principles such as philanthropy, responsibility, excellence, duty,

service, honor, honesty, and respect for others (3).

Institutionalization of professional ethics and communication skills is the seventh policy of the overall policy and orientation of reform and innovation packages in medical science education. Accordingly, redefining and adapting the professional codes of ethics and communication skills have been predicted based on the Iranian-Islamic teachings (4).

The first step in developing a secure framework for professional ethics appears to be to consider and identify the needs and rights of the individuals with disabilities based on the experiences of leading countries. Therefore, the present study was carried out with the objective to examine the professional codes of ethics of rehabilitation in Australia, Canada, the United States, and the United Kingdom through a narrative review study.

### Materials and Methods

In this study, the professional codes of ethics in Australia, Canada, the United States, and the United Kingdom were searched electronically through the

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Google search engine, as this language was understandable to the researchers (5-19). Accordingly, the professional codes of ethics of the rehabilitation fields (including orthopedics, occupational therapy, and physiotherapy) were extracted and reviewed by the two authors independently. Given the high volume of material from the first phase, a group of experts in the area of medical ethics and medical professionalism were consulted to determine how to categorize and report the material to suggest a guideline. Thus, it was decided to use the four principles of bioethics in the Principlism approach for classification (20).

In the first phase of the study, the researchers individually studied and translated the professional

codes of ethics of each of the rehabilitation associations and classified them based on the four codes of bioethics. Then, they checked the results together and reached an agreement through discussing any discrepancies in the classification. In the next step, the set of the professional responsibilities that were collected and categorized for the individuals in charge of rehabilitation services during the review study, were presented as codes of ethics for the rehabilitation services.

## Results

**Respect for autonomy:** Autonomy or the right to self-determination is the core medical value (21-24). Table 1 represents the codes related to autonomy.

**Table 1.** Codes related to the autonomy contained in the professional codes of ethics of rehabilitation associations (technical orthopedics, occupational therapy, and physiotherapy) in Australia, Canada, the United States, and the United Kingdom

Autonomy	
Client-centered approach	Each client has its own unique circumstances and must receive his own special services. The rehabilitation practitioner should always consider the values and beliefs, as well as the physical, emotional, social, and economic status of the client. All decisions made by the rehabilitation practitioner must be based on understanding the fact that the interests and desires of the clients are the first influential issue in this regard. The demands of the clients should be treated with respect and dignity.
Making informed decisions	
Providing information	The rehabilitation practitioner should provide the clients and, if necessary his companion, with the information needed to make informed decisions about the rehabilitation services required.
Empowering clients to make decisions	The rehabilitation practitioner should empower clients to make informed decisions about the rehabilitation services they need.
Improving stakeholder participation in decision making	The rehabilitation practitioner should fully elucidate the benefits, risks, and potential consequences of the services during the intervention as well as the alternative interventions.
Providing information to the client in accordance with his level of understanding	The rehabilitation practitioner should provide the client with the information needed for him to make decisions according to his level of understanding and mental, cultural, and linguistic conditions.
Self-determination	
Right to self-determination	The clients have the right to self-determination and the rehabilitation practitioner must respect that right.  The rehabilitation practitioner has the duty to rehabilitate the clients based on their decisions and in accordance within the accepted standards. The rehabilitation practitioner should encourage the client for decision-making.
The right to make decisions by the companions of the client	When the client is unable to make a decision, the right to choose is given to the qualified guardian.
Refusal to receive services	The rehabilitation practitioner should respect the right to refuse to receive services (both temporarily and permanently) even if it leads to poor outcomes.
Withdrawal from continuing participation in a research project	The rehabilitation practitioner should respect the right of clients to withdraw from continuing to participate in the research project (without interrupting continuation of their rehabilitation).
Consent	
The right to consent	The rehabilitation practitioner must respect the right to consent of the client.
Obtaining consent	The rehabilitation practitioner must obtain consent from the clients for services or participation in the research project after providing sufficient information and answering all their questions.
Secrecy	
The right to privacy	The rehabilitation practitioner must preserve the individual's privacy.

**Table 1.** Codes related to the autonomy contained in the professional codes of ethics of rehabilitation associations (technical orthopedics, occupational therapy, and physiotherapy) in Australia, Canada, the United States, and the United Kingdom (continue)

Autonomy	
Confidentiality of the client's information	The rehabilitation practitioner must keep the client's information confidential in all respects (verbal, nonverbal, written, and electronic). The rehabilitation practitioner should prevent the dissemination of information on virtual networks. The personal information of the clients should not be disclosed to any person (any natural or legal person) who does not directly responsible for the medical care for the clients, unless the prior consent has been obtained from the clients or their legal guardians in this regard.
Disclosure of confidential information	Confidential information must be fully protected by the rehabilitation practitioner unless there is a legal order to disclose certain information in order to protect the client or the community. In such circumstances, the disclosure of any confidential information must be made in coordination with the legal authorities.
Honesty with clients	
Honesty	The rehabilitation practitioner should provide the clients with accurate information.
Reporting unwanted faults and adverse events	The rehabilitation staff should identify and fully report human errors and adverse events.
Marketing and advertising	The rehabilitation practitioner can advertise through mass media such as newspapers, magazines, the Internet, interactive voice response (IVR), radio, television, email, etc.) adhering to the following conditions. a. The advertising shall not include falsehood, deceit, error, and exciting statements and allegations; b. The advertising shall not be misleading (not omitting necessary information); c. The advertising shall not be aimed at deceiving the client; d. The advertising shall not be along with the promise of any rewards for a rehabilitation practitioner; e. In advertising, there should be no more than what is offered.

**Non-maleficence:** This principle prohibits the deliberately inflicting harm on the clients (25,26). Table 2 presents the codes for this principle.

**Beneficence:** Maximizing benefits and minimizing damage is one of the key pillars of the usefulness of rehabilitation services provided by the trained and qualified professionals in this

field (27). Table 3 lists the codes related to beneficence.

**Justice:** The equitable distribution of the health sector resources is one of the underlying issues in social justice that has been addressed in the studies in the field of rehabilitation (28,29). Table 4 shows the codes related to justice.

**Table 2.** Codes related to non-maleficence contained in the professional codes of ethics of rehabilitation associations (technical orthopedics, occupational therapy, and physiotherapy) in Australia, Canada, the United States, and the United Kingdom

Non-maleficence	
Prevention of harm	The rehabilitation practitioner should prevent harm to the clients, colleagues, students, and participants in research projects and other staff. The rehabilitation practitioner should identify his own issues and limitations that can cause harm to service recipients, colleagues, students, and participants in research projects and other personnel and take appropriate action. The rehabilitation practitioner should prevent any factor that may harm the process of rehabilitation, training, and research.
Avoiding inappropriate referral	In case of a necessary referral, considering the type and severity of the disorder, resources and facilities, and benefits of the clients, the rehabilitation practitioner should refer them to the best provider of the service needed. In case of referring the client to a profit center to receive a service, it should be fully explained to the client by the rehabilitation practitioner. Employment and organizational communication or any other relationship between rehabilitation and other areas of health should not adversely affect adherence to professional ethics.
Avoiding inappropriate relationships with the clients	The rehabilitation practitioner should avoid establishing any mutual relationship that could negatively affect how the service is delivered. The rehabilitation practitioner should have a good relationship with other team members, clients, client companions, students, researchers, and other health and service providers and the community. The rehabilitation practitioner should maintain the dignity and respect of the other party in his communications and not abuse his position. The rehabilitation practitioner should avoid having sex with the clients, clients' companions, students, researchers, and generally with those he has a professional relationship with. The economic and financial interests and the physical and mental conditions of the rehabilitation practitioner should not negatively affect his professional communication.

**Table 2.** Codes related to non-maleficence contained in the professional codes of ethics of rehabilitation associations (technical orthopedics, occupational therapy, and physiotherapy) in Australia, Canada, the United States, and the United Kingdom (continue)

Non-maleficence	
Avoiding conflicts of interest	<p>The rehabilitation practitioner should avoid creating conditions that lead to conflicts of interest.</p> <p>In any case, the benefits of the clients are preferred to the benefits of the rehabilitation practitioner.</p> <p>The rehabilitation practitioner should work with responsible individuals and organizations to develop laws, guidelines, and instructions in order to address conflict of interest situations.</p> <p>Ethics take precedence over business relationships.</p>
Ethics in research	<p>The rehabilitation practitioner must obtain all necessary approvals and permits before conducting the study. Comfort and well-being of the clients should be one of the primary concerns in the implementation of the research project.</p> <p>All clients must consent to participate in the study and for the use of the study results.</p> <p>Conducting and presenting a study should be consistent with the research ethics guidelines and its benefits and risks should be outlined.</p> <p>The client information must be kept confidential.</p> <p>The study must be conducted in accordance with all regulations.</p> <p>There should be no fraud or deception in the study.</p> <p>All information must be completely clear.</p> <p>Appropriate encouragement should be provided to the individuals involved in the research project.</p> <p>If any behavior in the execution or presentation of the plan appears to be unlawful, the rehabilitation practitioner must immediately report the unlawful behavior.</p>
Financial benefit	<p>The rehabilitation practitioner should provide the service on the basis of the needs of the recipients of the services rather than based on the economic advantage.</p> <p>The rehabilitation practitioner should do his best to maintain the financial, administrative, and human resources of the organization and refrain from utilizing these resources to achieve personal goals.</p>
Cost of services	<p>The rehabilitation practitioner should not perform any incorrect, useless, or deceptive action to achieve economic benefits.</p>
Payment	<p>The rehabilitation practitioner should not excessively force the clients to continue the treatment.</p> <p>The rehabilitation practitioner should not give the wrong information to the clients about the cost and reimbursement of the services provided.</p>
Financial gain from referrals (rate)	<p>The use of the second-hand equipment is only possible with the consent of the client.</p> <p>The rehabilitation practitioner should not be directly or indirectly involved in sharing, transferring, assigning, or discounting any funds derived from referral of the client to any other person.</p> <p>Considering the nature and extent of the problem and the appropriate and useful treatment resources and services, the rehabilitation practitioner should refer the clients to the best service provider. The rehabilitation practitioner should provide and disclose any financial gain through a referral to the clients without any limitation. In addition, he must inform his head of any action that is inconsistent with the law.</p>
Financial inclinations	<p>The rehabilitation practitioner should explicitly declare any financial benefits he gains in return for providing the rehabilitation services to the clients.</p>
Gifts	<p>The rehabilitation practitioner should avoid accepting any gift that affects his or her ethical and professional decision-making.</p>
Avoiding stopping services	<p>If the rehabilitation practitioner was unable to provide services for any reason, he should not leave the client alone, but should provide the opportunity to transfer or refer him to another service provider.</p>
Complete compliance with the professional requirements	<p>The rehabilitation practitioner must provide service based on the professional standards.</p>
Dignity	<p>The rehabilitation practitioner must perform his duties in a way that reflects his and his profession's dignity.</p> <p>Examples of inappropriate behaviors include inappropriate rehabilitation, forging documents, abuse of professional credentials and documents, harassment of others, insulting and dispraising the former employer and other health care providers.</p>
Substance abuse	<p>The use of drugs and other substances that lead to impairment in observing the professional principles and judgment are not permitted.</p>
Blackmail	<p>The rehabilitation practitioner should not ask something from the clients directly or indirectly by intimidating, threatening, blackmailing, harassing, wrongly influencing, forcing, improper promising, or giving money to them.</p> <p>The rehabilitation practitioner should not request comments on the services provided from the clients who do not have the power to judge psychologically.</p>
Being a qualified representative of the profession and organization	<p>The rehabilitation practitioner should promote the organizational and professional behaviors, principles, policies, rules, procedures, and guidelines.</p>

**Table 2.** Codes related to non-maleficence contained in the professional codes of ethics of rehabilitation associations (technical orthopedics, occupational therapy, and physiotherapy) in Australia, Canada, the United States, and the United Kingdom (continue)

Non-maleficence	
Examinations and tests	The rehabilitation practitioner should work to maintain security and prevent disclosure of the contents and questions of the tests.
Communication with other health care professions	The rehabilitation practitioner should be concerned about how other health services are provided to his clients. The rehabilitation practitioner should have learned and apply the appropriate treatment with other members of the team providing service to the clients.
Public confidence	The rehabilitation practitioner should refrain from actions that lead to a decline in public confidence in the rehabilitation profession.
Avoiding harassment	The rehabilitation practitioner should avoid verbal, physical, emotional, and sexual harassment of other colleagues.
Encouragement to counseling	If the rehabilitation practitioner is aware of a colleague's inability to perform professional duties (due to physical, psychological, or substance abuse conditions), he should encourage that colleague to receive counseling services.
Avoiding plagiarism	When using the idea or the results of others' work in writing, verbal, or electronic presentation, the rehabilitation practitioner must recognize their property right with a suitable reference.
Delayed service provision	The rehabilitation practitioner should not accept any prescription or medical order if he knows and recognizes that he is unable to provide service within a reasonable period of time. In some cases, the rehabilitation practitioner should discuss the timing of the treatment with the client, physician, or other rehabilitation practitioner. The rehabilitation practitioner should not unreasonably prolong the service time.
Reporting violations	
Violation of regulations	The rehabilitation practitioner should promptly and accurately report any action (by the individual himself or by other colleagues) that would violate the professional code of ethics. The rehabilitation practitioner should prepare his reports accurately, respectfully, fairly, and timely. The rehabilitation practitioner should promptly report any unqualified, destructive, immoral, and illegal services that endanger the health and well-being of the clients. The rehabilitation practitioner has a maximum of 30 days for reporting from the time he is notified of violations of professional principles.
Prohibition of violations	The rehabilitation practitioner should prohibit other health-related clients from committing errors and abuses and report cases to the appropriate authorities if necessary.
Suspected cases	The rehabilitation practitioner should report any suspected cases of abuse of vulnerable children or adults to the appropriate legal authorities. If the rehabilitation practitioner is informed of a colleague's inability to perform professional duties, he should report as soon as possible to the competent legal authorities.
Other professions	The rehabilitation practitioner should communicate their concerns directly to the experts, rather than the clients, about services provided by other rehabilitation or health professionals.
Job application	The rehabilitation practitioner must observe honesty, fairness, accuracy, respect, and timeliness in setting his application and resume.

### Discussion

Rehabilitation services can eliminate the need for some treatments and surgeries by increasing abilities, lifestyle, and QOL. In many countries leading in the field of science, attention being given to providing rehabilitation services as an alternative to some therapeutic approaches is increasing. Professional ethics is a process of rational thinking and action that aims to realize what values should be maintained and disseminated in the organization. On the basis of professionalism, a rehabilitation practitioner helps the clients to make a proper assessment of the situation and to show a favorable attitude in challenging situations and ethical issues (23).

At present, the provision of rehabilitation services in the country, in some cases, is accompanied by the interference of the power and responsibilities of individuals or organizations providing services, the

inappropriate interaction of service providers with clients, and also the lack of observance of the rights of the needy people. One of the causes of this turmoil is the lack of formulation of rules that specify how to provide services and interact with people with disabilities. There seems to be a rational solution to many of the ethical issues in rehabilitation, creating and explaining ethical concepts, and adopting policies that, while providing sufficient information, outline the rights and responsibilities of the parties involved in rehabilitation.

Institutionalizing professional ethics and communication skills is the seventh policy of the overall policy and orientation of the medical science education reform and innovation packages based on which, redefining and adaptation of the codes of professional ethics and communication skills have been predicted based on Iranian-Islamic teachings.

**Table 3.** Codes related to beneficence contained in the professional codes of ethics of rehabilitation associations (technical orthopedics, occupational therapy, and physiotherapy) in Australia, Canada, the United States, and the United Kingdom

<b>Beneficence</b>	
Concerns about the welfare and safety of clients	The rehabilitation practitioner should be concerned about the welfare, health, and safety of clients.
Maintaining professional qualifications	The rehabilitation practitioner is required to obtain and maintain the professional qualifications required.
Improving quality of services	The rehabilitation practitioner should work to improve the quality of services by reducing errors and increasing the safety, satisfaction, and effectiveness of the rehabilitation services.
Responsibility	After accepting clients, the rehabilitation practitioner should do all he can to provide the appropriate services they need. The rehabilitation practitioner should accept responsibility for performing all necessary tasks, including assessment of clients, formulation (preparation and adjustment) of treatment plan, implementation of treatment plan, follow-up of treatment plan, management of treatment plan implementation, improvement and development of skills and competence, enhancement of professional performance capability. The rehabilitation practitioner should perform the evaluation and intervention of with each client according to his or her specific circumstances.
Delegation of responsibility	The rehabilitation practitioner should be treat the clients, colleagues, and other professionals with respect and fair. The rehabilitation practitioner should respect the inherent dignity of all individuals. The rehabilitation practitioner should be trustworthy and honest.
Independent and precise professional judgment	The rehabilitation practitioner should avoid delegation of his duties to unqualified individuals. The rehabilitation practitioner should perform the rehabilitation in all cases based on the best interest of the clients.
cultural differences	The rehabilitation practitioner should provide services with compassionate behaviors and reflect the individual and cultural differences of clients.
Control of clients	The rehabilitation practitioner should evaluate the clients at appropriate intervals to ensure that the rehabilitation goals are met.
Termination of service	The rehabilitation practitioner should terminate the service being provided when it is not useful for the clients.
Communication with clients	The rehabilitation practitioner should have a constructive and stable communication with the clients within the framework of professional ethics.
Professional knowledge	The rehabilitation practitioner must constantly be updating his expertise, knowledge, skills, and professional competencies.
Continuous learning	The rehabilitation practitioner should maintain and enhance his competencies by participating in continuing education programs. The rehabilitation practitioner should acquire the competencies needed to evaluate and apply emerging technologies.
Best action	The rehabilitation practitioner should provide the rehabilitation services based on the principles of the evidence-based interventions. These principles include intervention based on the latest research findings, clinical experience of the rehabilitation practitioner, and values of the clients.
Interdisciplinary collaboration	In order to provide the best possible service, the rehabilitation practitioner should have a proper interaction with the physician and other rehabilitation professionals and staff. The rehabilitation practitioner should provide the rehabilitation services within the scope of his professional competence. In cases where he is not qualified, he should refer the client to a qualified rehabilitation practitioner. In cases where the client is required to be referred to other rehabilitation staff, the rehabilitation practitioner must ensure the educational degree, professional qualifications, and experience of those staff. The rehabilitation practitioner should have appropriate and productive interaction with other members of the rehabilitation team. The rehabilitation practitioner should focus on developing an inter-professional environment and team. The rehabilitation practitioner should refer the clients when needed.
Individual and professional development	The rehabilitation practitioner should take action for personal and professional development based on self-assessment and on the progress of science and technology. The rehabilitation practitioner should strive to provide an environment where excellence, lifelong learning, and professional development are among the essential principles.
Service provision system	The rehabilitation practitioner must comply with the rules of the health system and the general laws of the country. The rehabilitation practitioner must be aware of and act on the laws and regulations of the service provision system. The rehabilitation practitioner must know the cost of the service and how to calculate and receive it. The rehabilitation practitioner should work to promote the accountable rehabilitation system, which also includes the right to choose of the clients.
Improvement of access to services	If the client still needs to receive the rehabilitation services and the rehabilitation practitioner is unable to continue providing services for any reason, he should inform the client and provide him with sufficient information on how the services would continue. The rehabilitation practitioner must provide the rehabilitation services in a timely manner and in accordance with applicable laws, instructions, and guidelines.

**Table 4.** Codes related to justice contained in the professional codes of ethics of rehabilitation associations (technical orthopedics, occupational therapy, and physiotherapy) in Australia, Canada, the United States, and the United Kingdom

Justice	
Impartiality	The rehabilitation practitioner should be active in promoting fairness and impartiality in the provision of the rehabilitation services.
Non-discrimination	The rehabilitation practitioner should not accept clients and choose treatment based on race, gender, color, religion, or nationality.
Access to services	The rehabilitation practitioner should not introduce the personal, religious, and cultural prejudices in rehabilitation, counseling, education, research, and management.
	The rehabilitation practitioner should help the individuals in need of the rehabilitation services to make sure they have access to these services.
	The rehabilitation practitioner should remove the barriers to accessing the rehabilitation services by providing strategies such as referring the clients to donations, introduction of charities, and consideration of organizational policies.
Fair price	The rehabilitation practitioner should not advocate discriminatory and unfair policies that prevent access to the rehabilitation services.
	The rehabilitation practitioner should inform the community about the benefits of the rehabilitation services to improve access to services.
	The rehabilitation practitioner should calculate and receive the bill of services and costs in accordance with the law in a fair manner.
Fair distribution of resources	The rehabilitation practitioner should consider the wise management and cost-effectiveness of limited clinical resources.
	The rehabilitation practitioner should work to reduce inequalities in health and improve access to the rehabilitation services and to address the health, welfare, and prevention needs of people.
	The rehabilitation practitioner should refrain from providing services more or less than the required level.
Educational justice	The rehabilitation practitioner educational justice should refrain from a series of actions that lead to illegal access to resources and questions of the professional qualification exams.

Moreover, in the context of professional ethics promotion, it is expected to develop professional ethics realization indicators in medical science education settings. Besides, to institutionalize professional values and ethics in the health-related higher education institutes, developing professional ethics codes in the areas of education, research, treatment, and administrative affairs should be considered as one of the main goals (4).

### Limitations

The limitations of the present study included the restriction of professional ethics codes to the fields of technical orthopedics, occupational therapy, and physiotherapy, as well as the restriction to English-speaking countries.

### Recommendations

It is suggested that the professional codes of ethics be extracted in other areas of rehabilitation such as speech therapy and audiology and in non-English speaking countries. Furthermore, considering the differences between the Islamic philosophy and ethics with the western ones, it is suggested that in future studies and in interaction with Islamic jurists, theologians, and philosophers, the ethical codes be extracted and

defined in accordance with religious culture and beliefs, in addition to defining its dimensions.

### Conclusion

In the present study, as the first step in developing a certain framework for professional ethics, the professional codes of rehabilitation in Australia, Canada, the United States, and the United Kingdom were examined through a narrative review study in order to suggest the basics of professional ethics in the rehabilitation services according to Iranian-Islamic teachings (30).

### Acknowledgments

The present study was based on a systematic review of studies and was registered with the registration code 295195 at Isfahan University of Medical Sciences, Isfahan, Iran. The authors would like to appreciate the Musculoskeletal Disorders Research Center and the Vice Chancellor for Research and Technology, Isfahan University of Medical Sciences.

### Authors' Contribution

Ebrahim Sadeghi-Demneh: Study design and ideation, attracting study funds, study support, executional, and scientific services, providing study equipment and samples, data collection, analysis and

interpretation of results, expert statistics services, manuscript arrangement, manuscript expert assessment in scientific terms, final manuscript approval for submission to the journal office, Saeed Forghany: Study design and ideation, attracting study funds, study support, executional, and scientific services, providing study equipment and samples, data collection, analysis and interpretation of results, expert statistics services, manuscript arrangement, manuscript expert assessment in scientific terms, final manuscript approval for submission to the journal office, responsibility for maintaining the integrity of the study process from beginning to publication and responding to reviewers' opinions.

### Funding

This study was conducted based on a systematic review of studies and was regulated by registration

code 295195 with financial support from Isfahan University of Medical Sciences and Isfahan Welfare Organization. Isfahan University of Medical Sciences and Isfahan Welfare Organization did not comment on data collection, analysis and reporting, manuscript preparation, and final approval of the paper for publication.

### Conflict of Interests

The authors declare no conflict of interest. Dr. Ebrahim Sadeghi-Demneh and Dr. Saeed Forghany received funding for basic studies related to this study from Isfahan Welfare Organization and Isfahan University of Medical Sciences and are working as the orthopedic associate professors at Isfahan University of Medical Sciences.

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