



Women Participation in Health Research of Iran: Analysis of Challenges and Strategies with Literature of Review

*Marziah Vahid-Dastjerdi*¹, *Maryam Mazahery*², *Batoul Ahmadi*³, *Mehrdad Kazemzadeh Atoofi*², *Farzad Kompani*⁴, *Nazila Rezaei*⁵, *Sahar Saeedi Moghaddam*⁵, **Shirin Djalalinia*⁶

1. Department of Obstetrics and Gynecology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran

2. Spiritual Health Research Center, School of Behavioral Sciences and Mental Health, Tehran Psychiatric Institute, Iran University of Medical Sciences, Tehran, Iran

3. Department of Health Care Management and Economics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

4. Division of Hematology and Oncology, Children's Medical Center, Pediatrics Center of Excellence, Tehran University of Medical Sciences, Tehran, Iran

5. Non-Communicable Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran University of Medical Sciences, Tehran, Iran

6. Deputy of Research and Technology, Ministry of Health and Medical Education, Tehran, Iran

*Corresponding Author: Email: shdjalalinia@gmail.com

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Abstract

Background: Recent evidence provides the facts behind the perceptions about women researchers participating in health research (HR). Women scientists as almost half of active researchers in HR fields have important and fundamental role. The present study aimed to analyses the situation of women participation in HR of Iran.

Methods: The present study comprised three complementary phases intended to identify and analysis challenges and problems of women participation in health research in Iran (2021-22). Following a review phase, using the content analysis approach through semi-structured interviews data gathered from key stakeholders of health research. At final step, aimed to aggregate and conclude the main key findings, through an expert panel all of the results analyzed to clarify the main messages of the study, focus on reflection to the target group.

Results: The results reveal considerable gender differences in research contribution between Iranian men and women. The need for legal infrastructure and support for the active participation of women in HR was the main extracted point of study. The need for transparent documentation and implementation of related research that demonstrates the necessary challenges and gaps was another major point.

Conclusion: Findings may help illuminate policy makings to promote participation of women in the country research. The optimal management of HR require facilities can play an important role in improving the quality and quantity of health studies and achieving scientific competitive positions at the regional and global levels.

Keywords: Health-related research; Women; Participation; Research



Introduction

In 2015, the United Nations General Assembly (UNGA) developed a comprehensive agenda for the 2030 sustainable development, through which science, technology and innovation (STI) defined as three main components for sustainability(1). Considering that, achieving to the perspective depends on putting the science at the core of the National Development Plan (NDP). Such an international competitive approach requires policymakers to optimize utilization of potential resources and facilities (1).

In this regard, Health Research (HR) follow a key function through which; “The people, institutions and activities involve in generation of high-quality knowledge use for promote, restore, and/or maintain the health status of populations”. Especially in developing countries, HR has a prominent responsibility in scaling up of knowledge production and addressing the gap between Research and Development (R&D) (2-4).

In the area of health-related research, women with a roughly equal share in terms of researcher's and academic members, considered as one of the fundamental capacities of countries (3, 5). Following the social and cultural transitions and recent changes in gender norms, women urged to assume their rightful position in higher education and decision making. Overcoming gender inequalities, developing countries are pursuing rapid and significant trends in women's participation in science and research development (6, 7).

Based on studies published in many countries in the region and the world; similar to other scientific fields, there are gender differences in medical sciences from various aspects. (7,8). These differences are evident in both developed and developing countries. Most of these differences are in favor of men. They show better performance and receive better funding and financial support (9, 10).

More over the progressing roles of women in planning and management of health researches,

in many special cases, as like as qualitative gender based investigations, the role of women researchers can be decisive (10, 11).

In order to identify challenges and improve the processes and functions, situation analysis along with the assessment the factors influencing on women's participation is an important issue. These findings lead to rationally allocation of funds and financial facilities, prioritize researches, and education investment (5, 12).

Investigating the status of women's participation in the HR and probable influencing factors of their participation, can lead to the optimal exploitation of women trained capacities (6, 13). Despite of the priority of the problem, there is an evident gap in the related literature. Considering these, we attempted to provide the situation of the women participation in health research of Iran.

Materials and Methods

The scope of study set for national level. Data gathering completed through 2021-2022. The present investigation comprised two phases followed based on primary desk review:

First phase

This step reviewed the 10 years relevant document to the women in health research of Iran(14, 15). We searched international data bases of Scopus, Web of Sciences (ISI), Google Scholar, and PubMed databases and the national databanks of SID and Iran.doc. Relevant websites (such as government agencies, universities, associations and societies, and professionals organizations, national documents, and results of annual evaluation of Iranian universities of medical sciences (UMSs) and research centers (RCs) were also searched for relevant data were also searched. Search strategy was developed based on the main roots of “women” and “health research”. If there were more than one documents that were extracted from one specific source, the most com-

pleted report included.

All of processes including; search; quality assessment and the data extraction conducted independently by two researcher. Probable discrepancy resolved through referencing the third expert opinion. Overall, 116 related documents were included in the study, and finally the information from 13 papers has been cited in present report.

Second phase

The process of conducting interviews

The interview guide questions, including six semi-open questions, designed based on the findings of literature review and study objectives. Analysis of the current situation of participation of women in health-related research; factors affecting the trends and process of changes; presenting and analyzing the strengths of programs and factors influencing the formation of the current situation, expressing and analyzing the existing challenges; Successful or unsuccessful experiences in the optimal management of the problem in Iran and the world and providing practical suggestions and solutions to delimitations were the main axes of the questions.

All interviews were audio-recorded and transcribed. The interviews lasted from 35 to 50 min. In addition to audio recording, field notes were also taken for the greater accuracy of data collection. The majority of the interviews were held in the interviewees' offices. The basis for determining the number of interviews and the duration of the interviews was to reach saturation in data collection. Interviews continued to the point of saturation, where that new information could no longer be obtained with the inclusion of new samples.

After the introduction, the moderator/interviewer gave an explanation about health research overview and then asked about the main challenges and problems of women participation in health research system and their corresponding solutions.

Through this phase; data analysis conducted manually based on content analysis through which simultaneously open coding, main concepts were extracted. The following stages were

performed according to Graneheim and Lundman's model: 1) transcription of interviews immediately after completion, 2) reviewing the entire text for a general understanding of the content, 3) determining semantic units and initial codes, and 4) classification of initial codes in more comprehensive categories. In this approach, the code categories were directly extracted from interviews.

The reliability of finding was controlled through the assessment of similarity between our findings with extracted results of independent another expert (16).

Third phase

Through this phase, considering the main findings of previous steps and benefitting from an expert panel, practical suggestion for promotion of participation of women in health research system of Iran discussed in terms of main challenges, gaps and practical suggestions.

Twelve experts in research fields of women's health, sociology, health policy, research management and research methodology, who held executive and organizational positions in HR were invited. The expert panel was appointed to discussion on "practical suggestion for promotion of participation of women in health research of Iran" on Jun, 2021 in Ministry of Health and Medical Education (MoHME). The results of panel reviewed through an interactive processes with participants reached to final saturation (17, 18).

Ethical consideration

The study was approved by Research Ethics Committees of National Institute for Medical Research Development (IR.NIMAD.REC.1398.170). Research reported in this publication was supported by Elite Researcher Grant Committee under award number 983066 from the National Institute for Medical Research Development (NIMAD), Tehran, Iran. Participants were informed that their participation was voluntary. After introduction of project and before each session, informed consent was obtained from all of the participants. All infor-

mation was collected and analyzed anonymously, and the results would be used only for research purposes.

Results

Results of first phase

According to aggregating the results of review; based on the report of the Institute for Research and Planning of Higher Education in Iran, in 2021; from 3,173,779 universities students', 49.2% were female. Considering the provincial distribution; North Khorasan (53.0%) and Kohgiluyeh and Boyer-Ahmad (43.7%) had the highest and lowest proportion of female university students', respectively.

At the same time, more than 21% of students belonged to graduate courses. Regarding the disciplines distribution, the humanities disciplines and related fields to technology and engineering had top ranks of frequency (50.9% and 24.0%, respectively). The fields of medical sciences and health stood at fourth place (with 151,110 male and 90,844 female students). Through recent decade, in the field of research 57% of PhD by Research students (more than 160 applicants) were female. From 779 MRCs which are active in different fields of medical and health sciences, about 80 canters (10.3%) research on specific field of women health or gender related problems.

This data only includes the collection of universities and higher education centers in the Ministry of Health and Medical Education and the Ministry of Science, Research and Technology. The Islamic Azad University due to the lack of comprehensive information has not been calculated in this collection.

Most of the researches in HRS run by faculty members and graduate or post-graduate students. Based on the last statistics published by the Institute for Research and Planning of Higher Education in Iran, 275 thousand and 749 people were studying in higher education institutions, from

them the sex proportion of total full-time and part-time academic members were 33.2% for women and 66.8% for men.

From 183,106 women who participated in the higher education of universities and institutes, academic staffs have the most frequency (36.3%) of those who are active in the educational structure. After them training mentors and assistant professor respectively with 6.1% and 5.9% of sharing are at second and third ranks (Table 1).

This table also includes scholarships and Islamic Azad University academic members.

In this time point, Hormozgan Province (31.6%), Kerman (30.8%) and Fars (28.7%), had the largest participants of female full-time faculty members in the provinces. Kohgiluyeh and Boyer Ahmed, Kurdistan, and Qom had the lowest female full-time faculty members among Iran provinces (respectively with; 15.2%, 15.8% and 16.6% of women participation).

Less than 40% of academic position assigned to women (8971 from 21164). The highest and lowest levels of women faculty positions belong to assistant professor and full professor degrees (respectively 62.4% and 7.3%).

Considering the distribution of academic members in Iranian universities of medical sciences; from 21064 faculty members 8971 (42.6%) were women. In both women and men, most of faculty members were at assistant professors grades. Comparing the men, women had less published papers (146024 vs. 346837) and citations (1639246 vs. 5177060). Women also in ESI's top researchers' list, shown less participant than men (887, 49.6%). The medians of scient metric indicators including; published paper, papers citations, researchers' h-index, citation per paper, international papers ratio, were higher in men than women. Men had a higher number of articles. The only exception was self-citation in papers (1.56% vs. 2.51%). These ratios were also followed at almost all academic levels of health researchers.

Table 1: Distribution of female faculty members of higher education institutions

<i>Type of participation</i>	<i>Academic degree</i>	<i>Governmental</i>	<i>Non-governmental</i>	<i>Total</i>
Full-time teaching staff	Full Professor	356	308	664
	Associate Professor	1467	543	2010
	Assistant Professor	6191	4183	10374
	Mentor	2903	4300	7203
	Teacher Training	24	46	70
	Academic staffs	10941	9380	20321
	Others	308	112	420
	Total	11249	9492	20741
Part-time teaching staff	Full Professor	11	21	32
	Associate Professor	29	12	41
	Assistant Professor	162	270	432
	Mentor	411	3618	4029
	Teacher Training	13	147	160
	Academic staffs	626	4068	4694
	Others	43973	22145	66118
	Total	44599	26213	70812
Total	Full Professor	367	329	696
	Associate Professor	1496	555	2051
	Assistant Professor	6353	4453	10806
	Mentor	3314	7918	11232
	Teacher Training	37	193	230
	Academic staffs	44281	22257	66538
	Others	55848	35705	91553

Scientometric results

• **Publications and citations**

Given Scopus data, during 2010–2021, globally; 4,901,051 papers have been published related to the women health fields. Considering the Middle East countries contribution (131028 papers), the top level of distribution of related papers assigned to Iran (38, 836 papers). After that Turkey with 30,307 papers ranked as second position.

The time trends of published papers have been showed in Fig. 1.

During this period; 890,938 citation were affiliated to 105,120 papers published in the related fields of women health, in region countries. Iran with 109,585 (12.30%) citations, was belonged to Iran. Based on the Pearson Chi-square test results, all of region countries' have significant time trends in their women health publications' citations ($P=0.000$).

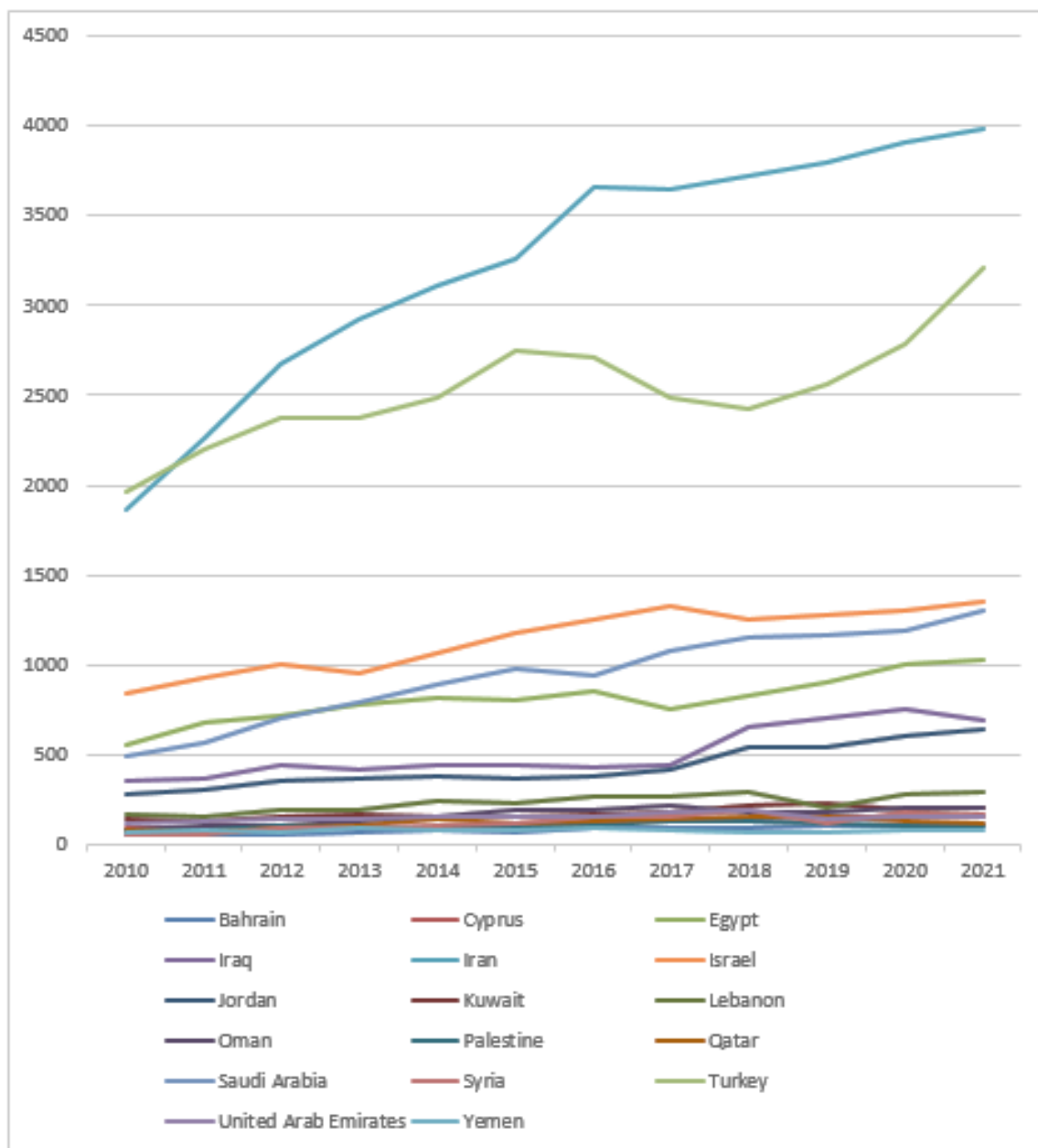


Fig. 1: The time trend of women health publication by Middle East countries, 2010–2021

• **Subject area**

In overall, in global level, most of published papers in women health assigned to the field of Medicine (54.4%). After that, the highest proportion of publications belonged to, biochemistry (11.7%), and neuroscience (4.2%), respectively. In Iran, publications approximately follow this distribution. Considering the results, 67.1% of

Iranian papers were completely related to medicine 9.2% were published in the field of biochemistry, genetics and molecular biology, and 4.3% were aligned to the fields of social sciences. Fig. 2 compares the distribution of publications' subject area of women health publications between region countries.

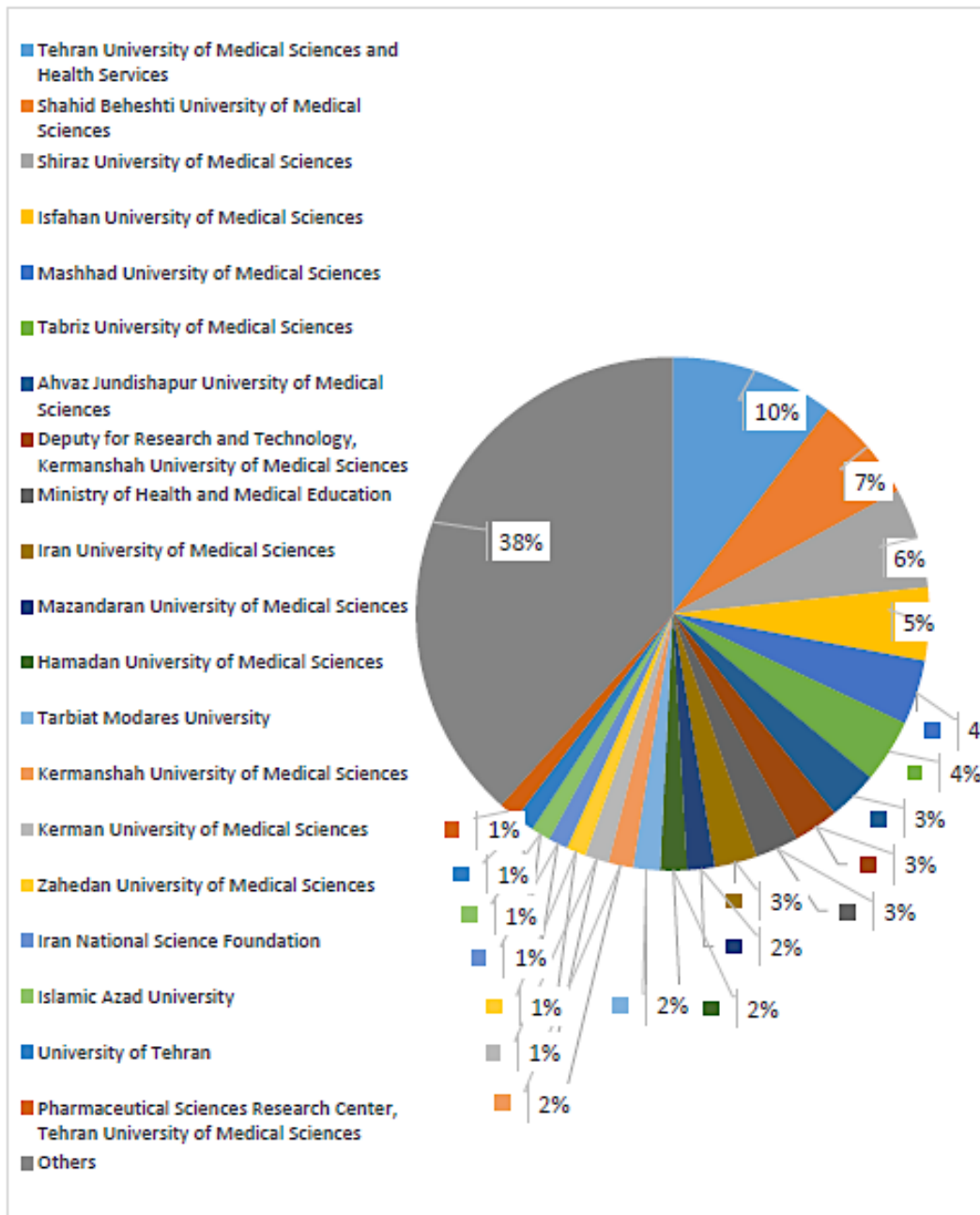


Fig. 2: Distribution of funding sponsors of women health research in Iran, 2021

At global level, National Institutes of Health with the most contribution of 3.5% (for 142727 cases) was the top ranked institute in funding the women health studies. After that National Natural Science Foundation of China and Canadian Institutes of Health Research respectively with 2.1% (84219) and 0.5% (21050) of contributions were

the 2nd and 3rd women's health research supporting institutes. In Iran, Tehran University of Medical Sciences was responsible (2.4%) Shahid Beheshti University of Medical sciences (1.5%) and Shiraz University of Medical Sciences (1.4%) were the top funders of women's health researches.

Results of questioning phase

According to the goals of the study, from 16 themes, 111 codes were extracted. The most relevant findings presented in Table 2.

Table 2: The main themes and correspond codes obtained from the content analysis

<i>No</i>	<i>The main themes</i>	<i>Codes</i>
1	Presence and participation in decision-making	-Implementation of plans -The impact of women -Barrier for women's -participation -Decision-making -Macro-planning -Attitude
2	Important priority in cycle of health research	-Education facilities -Different job aspects -Salary -Place of work -Position conditions -Leadership positions
3	Differences in place of academic and research position	-Challenges -Gaps -Revision and change Legislation -Policy making -Successful experiences
4	Gender differences in place of academic and research position	-Participatory role
5	Cultural issues	-Social environment -Media
6	Required motivations and incentives	-Spiritual incentives -Material incentives -Benefits -Motivations -Determining factors -Policies -Challenges -Efforts to enhance -Long-term activities -Meet the minimums Requirements -Promotion of educational -Evaluation system
7	The need for development of some legal infrastructure	-Special circumstances -Various roles in the Family -Various roles in social fields -Laws -Guidelines
8	The need for development of some facilities	-Development of resources -Training of researcher -Manpower -Expansion of research centers -Scientific services -Resources -Implementation of effective studies -Networking -Mentor sheep -Post Doc planning

Findings of key informants' in-depth interviews have been concluded under the following five major domains:

The presence of women and their participation in decision-making:

The impact of presence of women and their participation in decision-making was the first and the most emphasized topics, nearly noted by all of the participants.

Gender differences in place of academic and research position:

Obvious gender differences in place of academic and research position was the other addressed issue nearly by most of participants (both men and women participants). Interviewees stated that not only gender differences affected in education facilities but also it remain across different job aspects as salary, place of work, position conditions, leadership positions, among others.

Transparent documentation and the design and implementation of related research:

The need for transparent documentation and the design and implementation of related research that demonstrates the necessary challenges and gaps was another major focus. Participants noted that "some evidence requirements impact how scientific research shall be carried out. Moreover, there are some gray areas where more supplementary documents would be needed."

Required motivations and incentives:

The motivations and incentives needed to encourage researchers and managers to actively participate in research were another focus of the results. Health researchers have strongly emphasized that the benefit of spiritual and even material incentives is one of the most important and determining factors in motivating individuals for serious and long-term research activities.

Legal infrastructure and facilities:

As another topic discussed by the interviewees, the need for development of some legal infrastructure was emphasized. In this section, mainly researchers and research experts and to some extent managers emphasized that due to the special circumstances of women and their various roles in the family and social fields, it is necessary to

have laws and guidelines that facilitate their active presence in research.

Results of panel discussion

Panel discussion on "practical suggestion for promotion of participation of women in health research system of Iran" was held on Jun, 10 2021 in MoHME. Ten key informants on women health from different disciplines of health management, gynecology and obstetrics, social sciences, psychology, sociology, health policy, and researchers in women's health participated in this panel.

In terms of women's participation in health research system it is reasonable to encourage them for further contribution and quantitative and qualitative improvement of ongoing activities. One of the most important points emphasized in the results of this panel was the need to pay attention to require legal infrastructure and support for the active participation of women in this field. Supporting strategies for their engagement has become an important topic for our panel discussion. There were many questions and challenges in the audience, like what that is and how to do this. We discussed on examples of successful experiences which we find through the search of existing literature. There is a chain of interactive factors that work through a complex network. Advocacy and educational program for women, planning for more attractive manners of participatory involvement of women in HR and increase the number of meetings with successful persons and institutes for experience exchange were another suggested topics.

Discussion

The results several key insights on the situation of Iranian women in health research. Gender differences is evident in research contribution and women have fewer published papers than men. Through the qualitative parts of study, the need for legal infrastructure and support for the active participation of women in HR was the

main point highlighted by most of interviews and the expert panel.

There are some studies on different aspects, strength and challenges of HR in Iran. Most of available reports are scattered or limited to overall estimations of situation of HR indicators' and trends of research publications. Some of them also focused on comparing the HR and technology's patterns between Iran and other countries (1, 7, 19).

Considering the collaborative contribution of Iranian women in HR and their participation in post-graduate positions, the interpretation of findings reveals a considerable sex differences in research involvement and higher position jobs. These situation rather than more tendency of women for entering to graduate or post-graduate courses, rooted in more complex factors such as gender different roles. The number of female students in medical sciences disciplines is more than 1.5 times of males. The social gender-based role of men and their highlighted responsibilities for household income, is one of the most important gender-disruptive factors in their decision about post-graduate levels (20, 21). Sex segregation in fields of higher education and research involvement become an operational problem in many countries (19-21). The results of present study indicate that the number of female student in undergraduate and doctoral degrees is higher than men but in the specialist doctorate degree, there is a clear decline. This may be one of the reasons for the drop in the number of female faculty members in assistant professors and higher levels (20-24). In some countries such as Japan, as like as our country patterns, despite the improvement in educational levels of women, social participation follows slow trends that may rooted in many cultural and social factors of population contexts(24, 25).

Differences between men and women can be seen in many fields, including health and diseases, educational performance, risk preferences, social and competition. While some of these differences can be explained on the basis of biological differences, especially when discussing health and

disease, many of the differences are social and represent inequality(26, 27).

Investigations discussed on factors affecting the active participation of women in social activities, including research and development in three categories of; cultural and value influencing factors; family characteristics, adherence to traditions and socio-economic status, and demographic variables. They believe that women's participation in socially expected activities, including the design and implementation of effective research, doesn't work as expected (11, 25).

Based on the Institute for Research and Planning of Higher Education report; more than 275 thousand trained experts were studying in higher education institutions of the country, from them the sex proportion of full-time and part-time staffs were 33.2% for women. Many related studies confirmed that, academic health centers and research institutes face with complex challenges of promotion of female faculty members and their rational requests for leadership positions (8, 28, 29). The gender bias in academic medicine has been studied in many other related evidence (5, 8, 23, 29).

Based on the investigations from other countries; although this gap varies between disciplines and sub-disciplines, women in areas where research is expensive have fewer published papers, possibly due to policies and related procedures. Women are less involved in budget allocation.

The Comprehensive Scientific Map of Iran determined the goals, policies, strategies, and requisites (6, 30). One of the most important topics discussed in the document focused on the best approaches for development of potential capabilities, includes efficient human resources, to achieve program goals. The document also emphasizes on vision of gender equity in all areas of sciences (6, 23, 30).

In other countries, women in universities of medical sciences are affected by bias in grant programs for research funding, unequal allocation of resources among departments, and difficulty in access to the expert instructors. Women may also be disproportionately affected by personal factors

related to social demands, such as more housework (31-34).

Findings of related investigations confirmed that providing special training on reducing the gender-based biases can serve as an important step toward reducing gender bias in academic medicine and promoting of women to higher position (5, 7).

The present study benefited from many strength points. First, through a well-defined review we studied the relevant document to the women in health research in Iran. Moreover aimed to clarify practical suggestion for promotion of participation of women in HR, the main findings of review and qualitative steps analyzed in specific expert panel and extracted findings listed as the main proposed solution for better approach in HR functions.

We also faced with some limitation. Through review it revealed that related studies are very limited. Most of them were non-peer review scattered reports that were not reliable and not accessible through systematic procedures. Through analyzing the second phase; there were some limitations in multidisciplinary subject categories. As another limitation, despite the efforts and presented explanations, few invited participants did not accept our invitation to attend the panel meeting.

As the main implication of study, in terms of women's participation in HR, it is more than reasonable to encourage them for further contribution in new fields of activates and quantitative and qualitative improvement of ongoing activities. Related evidence confirmed that applying the concept of gender mainstreaming depends on institutionalizing gender issues at the heart of the ministry's processes. Its mechanism is to maintain values, norms and beliefs, change of men's attitudes towards women's capabilities and de-stereotype and positive perception of women towards their capabilities and efficiency.

Journalism Ethics 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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Conflict of interest

The authors declare that there is no conflict of interests.

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