

Scientific Outputs Regarding Occupational Health among Female Workers

MARYAM NIKPOUR¹; MOZHGAN FIROUZBAKHT¹; ARAM TIRGAR^{1*}

¹*Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran.*

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ABSTRACT

Although the International Labor Organization (ILO) has reported that two-thirds of the world's occupations belong to women, a few studies regarding employed women have been conducted. The present study aimed at conducting survey on scientific outputs regarding women's occupational health. This cross-sectional study was conducted from 2010 to 2014 at five-year intervals on a number of hygiene-based journals regarding workers' health at Scimago data center. Surveyed articles were categorized on the basis of type of work-related risk factors, methodologies, types of women jobs. Articles were distributed under the terms of the subjects. Out of 4,197 published papers on 17 subjects related to occupational hygiene indexed by Scimago, 203 papers (4.8%) were allocated to women's health. With regards to women's health, health staff had taken the most papers with 37.7%. Most of the studies were cross-sectional and on hazardous chemical agents. Due to low range of articles with the issue of occupational hygiene, it was concluded that occupational hygiene researchers have not focused much attention on this occupational group.

KEYWORDS: *Scientific output, Women health, Employed women*

INTRODUCTION

Women's health is one of the basic priorities of a society and is third among the millennium development goals [1]. Women comprise half of the world's population [2-3], and have a direct role in development. There is a direct relationship between women's economic activity and social welfare. The more women's economic activity in the society, the more is the social welfare improvement [4-5]. In recent decades, women have taken a reliable role in occupations in developed countries such that International Labor Organization (ILO) reported that 50% of the world's workforce has been women in 2010 [6].

Although this ratio in Iran and many other developing countries is lower, women's involvement in agriculture, unpaid domestic works and informal jobs caused the far higher real employment rate of women than what is reflected in the reports. ILO has reported that women comprised two-thirds of the world's workforce [7].

During recent decades, developed countries have reached the desired situation in

social welfare, workplace health and wide range of laws in occupational hygiene despite the fact that developing countries that face insufficient resources, abundance of cheap labor and neither recognition nor acceptance of workforce as an essential need. In this situation, women's occupational health was not of much importance and they would be ignored to the advantage of their male counterparts. Even if they receive equal gender considerations, since the most occupational standards are adjusted to suit men, women can take less favor or experience ineffectiveness of approved laws than men.

Women's health is influenced by their biological characteristics as well as their roles in fertility and family healthcare, and is different with men [8-9]. Women play different roles in the society and family [10-12]. They spend different physiological intervals (puberty, menstruation, pregnancy, childbirth, and menopause) and being at higher risk level of poverty, hunger, malnutrition, heavy workload, and gender discrimination [1].

There is limited information about employed women's health especially in developing

* *Corresponding Author: Aram Tirgar*

Email: a.tirgar@mubabol.ac.ir

countries. Also, women suffer from lack of proper policies or management of informal sector and agriculture in which most of them work. Thus, planning to educate employed women's healthcare and to provide appropriate scheme to women's health promotion seems necessary [13].

Whereas development in each field at the first step requires the scientific development, and scientific development needs strong and detailed planning, the first step towards planning is recognition of the status quo. Review of quantitative or qualitative scientific outputs such as original articles published in valid scientific journals can help to survey the status quo [14]. Few researches have been done in scientific outputs regarding employed women. As an example, an evaluation on journals since 1970 to 1990 duration shows that one-thirds of original epidemiological articles (job-related cancer) belonged to women. On the other hand, since the early 90s, the number of published papers regarding women has been decreased causing worries for researchers [15]. Only 15% of scientific journals have published original articles on women's health issues [16].

Since women's health promotion is not only a right, it is also a movement in line with society and family health and maintaining the national capital and labor environments. The survey on conducted researches in this field can be through the description of status quo and subject trends can survey the issue and identify the gaps. Therefore, weak-points of the previous studies can be found and research priorities can be determined and prevented to avoid repetition in further researches. Moreover, there was no such study conducted in Iran.

The present study was conducted with the aim of surveying the scientific outputs published in international journals regarding female workers.

MATERIALS AND METHODS

The present retrospective cross-sectional study has been conducted from 2010 to 2014 in five-year intervals among all ISI published original articles indexed by Scimago. The most important reasons for choosing this database included its easy-access and considerable extension of information sources.

Statistical population included all ISI articles indexed by Scimago database. Inclusion criteria were ISI articles indexed by Scimago in the field of health and occupational hygiene alongside having the word "Occupational" in title. Hence, 21 scientific journals indexed by Scimago were selected. Three of the journals, which were not open-access and one of them in which the term "article" instead of "original article" was used, were excluded from the study. After all, all published original articles in the remaining 17

journals were surveyed and evaluated in five-yr intervals to year 2014. Finally, the selected original articles in line with the study subject (women's occupational health) were surveyed one by one.

In order to collect the information, the common way in the field of scientometrics was used to evaluate the scientific publications and quantify their developments. To attain this objective, the abstracts of all original articles were picked up so that the information was written on the provided sheets by the research team [17]. In case the required information was not given through the abstract, the full papers were used instead.

Surveyed original articles were categorized on the basis of type of hazardous environmental agents (Physical, Chemical, Biological, Psychosocial, Ergonomic and shift work), methodology of the study (cross-sectional, cohort, case-control, retrospective, interventional and systematic), and types of women's jobs (services, industrial and agricultural). In addition to the above parameters, distribution of the subjects in comparison with Iran's health research priorities (mortality and diseases, fertility health, social and economic factors affecting women's health) was also considered. To get to the point, Supreme Council of the Women's Culture and Society's Priority list was used.

It is necessary to mention that although other relative journals might publish original articles in terms of women, nursing and midwifery, the results were eliminated to the original articles having the word "occupational" in their titles.

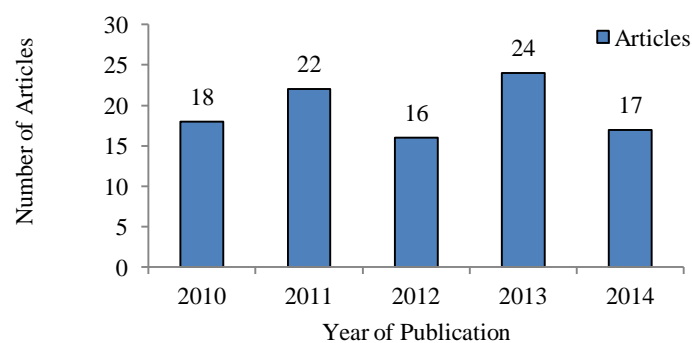
RESULTS

According to the survey of 17 journals in the field of occupational hygiene available in Scimago data center that have the word "occupation" in title, totally 4,197 original articles have been published since 2010 to 2014 and in a five-duration intervals. Detailed information about the frequencies of journals and original articles are presented in Table 1. Accordingly, out of 4,197 published papers (4.8%) were allocated to women's health. The most and the least numbers of mentioned original articles respectively belonged to the Journal of Occupational and Environmental Medicine with 38 original articles and the Journal of Research in Occupational Stress and Wellbeing with no original articles.

Publication process: In this paper, the publication trend of women-related articles was surveyed. Data process showed that during the years of survey, the publications did not follow a steady trend and they had up-trending and down-trending (Fig.1).

Table 1. Frequency distribution of journals and original articles on the subject of occupational hygiene indexed in Scimago during 2010-2014

Number	Title of Journal	Publishing country	Total number of published journals	Total number of published original articles	Number of original articles related to women's health
1	Annals of occupational hygiene	England	60	389	4
2	Archives of Environmental and Occupational Health	The United States	20	119	16
3	Indian Journal of Occupational and Environmental Medicine	India	15	63	9
4	International Archives of Occupational and Environmental Health	Germany	40	216	22
5	International Journal of Occupational and Environmental Health	The United States	60	600	7
6	International Journal of Occupational and Environmental Medicine	Iran	15	87	1
7	International Journal of Occupational Medicine and Environmental Health	Germany	20	199	18
8	Journal of Occupational and Environmental Medicine	The United States	60	624	17
9	Journal of Occupational Health	Japan	30	241	18
10	Occupational and Environmental Medicine	England	60	600	38
11	Journal of Occupational Health Psychology	The United States	20	84	6
12	Occupational Medicine	England	40	300	18
13	Work and Occupations: an international sociological Journal	The United States	20	82	7
14	New solution: environment and occupational health policy	The United States	20	208	5
15	Occupational Ergonomics	Netherland	12	45	1
16	International Journal of Occupational and Environmental Health	The United States	20	200	16
17	Research on occupational stress and wellbeing	The United States	5	40	1
	Total		517	4197	203

**Fig.1.** Publication trend of women's occupational health-related articles indexed by Scimago during 2010-2014

Occupations studied in original articles:

Among 203 original articles related to women, a quota of 150 original articles was allocated to female workers (74%), but in 53 original articles (26%), the subject was more focused on the effects of environmental factors (air pollution, toxicity, traffic etc.) on women’s health rather than jobs.

Among female workers, the most surveyed occupational groups belonged to the following service occupations: (health-treatment personnel with 37.7%), industry and agricultural occupations

(18.7% and 4% respectively). The given details are presented in Table 2.

Methodology of published original

articles: Almost half on the studies has been cross-sectional (46.8%) and cohort, case-control and retrospective studies were the rest. Few original articles were qualitative or the type of study was not mentioned. The mentioned original articles were put in a separate category named “others”.

Table 2. Frequency distribution of original articles allocated to women’s health and indexed by Scimago in terms of occupation during 2010-2014

Type	Occupation	Frequency	Relative frequency (%)
Service	Healthcare workers	56	37.3
	Office personnel	13	8.7
	Barbers/hair dressers	11	7.3
	Cooks	8	5.3
	Sales persons	5	3.3
Industrial	Workers	28	18.7
Agricultural	Farmers	6	4.0
	Others	22	14.7

Table 3. Frequency distribution of original articles allocated to women’s health and indexed by Scimago in terms of methodology during 2010-2014

Methodology	Frequency	Relative frequency (%)
Cross-sectional	95	46.8
Cohort	42	20.7
Case-control	18	8.9
Retrospective	11	5.4
Intervention	7	3.4
Systematic	10	4.9
Others	20	9.9
Total	203	100.0

Surveyed hazardous agents: Surveyed original article’s hazardous agents were categorized into 7 groups including physical agent, chemical agent, ergonomic, psychosocial, biological and safety aside “others”. The term: “others” refers to an unspecified or different factor. Surveys show

that most studies have been carried out on the field of hazardous chemical agents (Table 4).

Also, the Frequency distribution of original articles allocated to women’s health and indexed by Scimago in terms of Iranian women’s research priorities has been shown in Table 5.

Table 4. Frequency distribution of original articles allocated to women’s health and indexed by Scimago in terms of hazardous agent during 2010-2014

Hazardous agent	Frequency	Relative frequency (%)
Physical	33	16.3
Chemical	56	27.6
Ergonomic/Shift work	43	21.2
Psychosocial	49	24.2
Biological	4	2.0
Safety	3	1.5
Others	15	7.4
Total	203	100.0

Table 5. Frequency distribution of original articles allocated to women's health and indexed by Scimago in terms of Iranian women's research priorities during 2010-2014

Priorities	Frequency (%)	Research topics	Frequency (%)
Fertility health priorities	66 (32.5)	Pregnancy care	6 (3.0)
		Results of pregnancy and lactation	50 (24.6)
		Reproductive system	10 (4.9)
Mortality and disease priorities	95 (46.8)	Psychological disorders	20 (9.9)
		Cancers	23 (11.3)
		Musculoskeletal disorders	19 (9.4)
		Death and heart diseases, hypertension, metabolic syndrome	22 (10.8)
		Respiratory and skin diseases	11 (5.4)
Social-economic priorities	29 (14.3)	Quality of life, lifestyle, gender inequalities	13 (6.4)
		Violence	16 (7.8)
Others	13 (6.4)		13 (6.4)

DISCUSSION

Incoherent and insufficient researches as well as lack of proper health problems information about the employed women's different life eras are serious challenges on women's health's policies and administration in Iran [1]. Therefore, the aim of the present study was to conduct survey on scientific outputs published in ISI journals and indexed by Scimago database regarding occupational health among employed women. It is hoped that access to this information would enable us to identify research gaps and challenges to adopt appropriate strategies and useful actions. In this paper, 203 (4.8%) scientific researches were allocated to women's occupational health out of a total of 4,197 published original articles in the field of occupational hygiene.

The number of studies conducted was less than expected on the scale of women's share (50%) among workforces and their effect on the society and family health. Women's health is a milestone with the highest effect on social health [18].

Results of this study on the ratio of published original articles are almost in line with previous studies [16, 19]. The first survey on three decades' mental health-issued original articles published by National Institute for Medical Research Development (NIMAD) regarding Iranian women's mental health resulted in the fact that out of 3,031 surveyed original articles, 239 original articles (7.9%) were related to women's mental health [19]. Approximately, 15% of published original articles by health-related scientific journals were allocated to women's health in 1996 and 2006.

Having considered the share of female workers (50%) all around the world [20-23] as well as LAO's report on the performance of the world's two-thirds of jobs by women (7), and with attention on the aim of occupational hygiene in the promotion of workforces' health [24], the percentage of published original articles in the field of female workers' health seems inadequate. In other words, allocation of only 5% of original articles to women can be due to insufficient

considerations to this gender-based occupational group.

Analysis of the published articles declares a consecutive upward and downward trend during the surveyed years (Fig.1). Although in Izadian et al.'s study [19] on published original articles related to mental health in a thirty-year interval, the result was that the published articles have had a rising trend by years; this non-alignment might be related to the differences in the present study intervals (5 years).

A survey on published studies with occupational classification showed that researchers have put more considerations on health staff rather than other workers. Since it was obvious that healthcare staff was mostly women and as an example, 90% of the US nurses in 50 states were reported to be females [25]. Easy accesses to healthcare personnel and researchers who were males and have the same educational degrees with the samples of study have resulted in elimination of one-thirds of the total studies to healthcare personnel. Health-care personnel are faced with long hours of work, shift work, mental pressure, high work pressure and exposure to infectious diseases (such as HIV and Hepatitis) and the society's health is involved [26].

Regarding the importance and necessity of studying in other occupational groups such as agriculture and unpaid jobs, active women in this field are not official workers and have not probably benefited from the monthly fixed and adequate salaries as well as insurance. On one hand, the mentioned situation may cause difficulties for them due to the decrease in their access to healthcare services and on other hand, with the high use of pesticides for pest control in agriculture and their influence on the occurrence of symptoms, the evaluation on this occupational group's health seems to be necessary. Although agriculture is a risky occupation with considerable number of female workers [27], only 4% of the total published articles belonging to agriculture seems less than the expectations and expresses an ignorance of this gender-based occupational groups' health. Hence,

performing new research in the field of agriculture, the female worker has a high level of importance that can lead to the collection of information about their occupational health.

Data process in terms of the type of study has shown that approximately half of the performed studies were cross-sectional. These results affirm the results of another study on articles involving the Psychiatry published by two valid journals during 1960 to 1990 [28]. It may refer to the ease in conducting the mentioned studies as well as less required time in interventional studies in comparison with the cross-sectional ones.

Among all occupationally hazardous agents, chemical agents, mental factors and ergonomics have the most number of articles respectively. Increase in the level of health and decrease in contagious and infectious diseases alongside the increase in chronic diseases and mental disorders have led to the researchers' conduct of their studies in these fields.

Data process in terms of the title of studies in comparison with priorities of research in Iran have shown that the most share of published articles were in the field of mortality, disease and pregnancy health respectively. However, a few researches have been done on social and economic factors affecting women's health. It might be because of the fact that researches are mostly done by health science professionals, especially occupational health experts and sociologists have not taken a serious part in these researches. Researches on pregnancy and lactation among sub-groups of women's health priorities, have taken the most numbers of published articles (24.6%). Therefore, the study on women's health has been done with the purpose of the importance of pregnancy and fetus' health and there were no equal concentrations on other health aspects. Out of 23 studied sub-groups, researchers have focused attention on 12 sub-groups in spite of the other 11 sub-groups with no research. These results are consistent with another study in a way that out of 23 sub-groups, no result was found in 9 categories related to Iranian journals of health and hygiene [16]. Some articles may be prepared by administrative organizations, but they are not published in scientific journals yet. All in all, the number of published articles in the field of women's occupational health is very few as compared with the number of female workers and their responsibilities in the society and family.

Regarding the fact that women's health has a direct impact on the development, health and promotion of the society, Iranian researchers have seen the necessity to work on the mentioned field and recommended the prioritization and conduct of relative studies. The health of a country, city or a small society is strongly influenced by women's health as well as that of men [29].

The present study had faced some limitations including the limited intervals (5 years) as well as limited number of journals in the field of occupational health and hygiene. Despite the surveys on over 4,000 articles, 17 valid scientific journals can be discussed as considerable and approximately wide ranged sample of studies regarding women's occupational health.

CONCLUSION

Although women constitute half of the world's workforce and two thirds of the world's works are performed by women, a survey on valid scientific researches in the field of workforce health (over than 4,000 published papers by 17 scientific journals during 5 years) has shown that a few number of articles (less than 5%) were allocated to women's occupational health, its difficulties and problems. The mentioned issue was less-considered, neglected or ignored by researchers.

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