Original article

The publication status and general quality of internationally published articles by Iranian nursing scholars

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Abstract

Background and Purpose: One of the most reliable methods to evaluate the scientific status of nursing is the assessment of the trend and quality of related articles. This study aimed to determine the publication status and general quality of articles published by Iranian nursing scholars engaged in different nursing and midwifery schools in well-known international journals during 2000-2011.

Methods: This descriptive, cross-sectional study was conducted using scientometric methods and data obtained from Scopus database. The search for articles was performed using keywords such as Iran and nursing, and 886 articles were found dating from 2000 to 2011, 697 of which were authored by Iranian nursing scholars. Data collection was performed using checklists, and the validity of the checklists was determined using content validity. Data analysis was performed using descriptive statistics (frequency and mean) and Spearman's rank correlation coefficient in SPSS V.16.

Results: Publication of international articles written by Iranian nursing scholars has been on a rising trend, increasing from only 3 articles in 2000 to 238 articles in 2011. Mean of Scopus article citation counts was 2.9±5.1, while the mean of related journal impact factor was 0.97±0.62. Regarding the number of articles, as well as the citation counts, the highest-ranking nursing and midwifery schools were Tehran University of Medical Sciences, Tarbiat Modares University and Isfahan University of Medical Sciences, respectively. Based on citation index, Kashan University of Medical Sciences, Tehran University of Medical Sciences and Tarbiat Modares University were the leading nursing schools in terms of article publication.

Conclusion: Despite the increasing publication rate of articles by Iranian nursing scholars in popular international journals in recent years, there has been no significant improvements in the quality of these articles. According to the findings of this study, there is a noticeable gap in the quantity and quality of the scientific products by Iranian nursing community. Therefore, new policies are required as to enhance the quality and quantity of the articles published in the field of nursing and midwifery.

Keywords: Iran, Nursing, Publication, Researcher

Introduction

Databases are considered as the essential sources for publishing the knowledge produced by various scholars on different fields of science (1), as these pieces of research reflect the results of scientific projects on the international map in order to achieve credit and recognition (2). In recent years, the presence of Iranian research and education in the international science community has been on a rising trend (3). According to a report by the Institute for Scientific Information (ISI), Iranian universities published 9019 medical articles in 2011, ranking Iran as 43 among 107 other countries (4).

Scientific research produced by Iranian scholars in the field of medicine saw a gradual increase during 2000-2008, with a relatively steeper curve from 2006 to 2008 (5). In the field of nursing alone, the number of internationally published articles soared twofold each year during 2008-2012 (6, 7). With the increasing number of academic staff and postgraduate students, especially nursing

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PhD candidates, the amount of medical articles is expected to surge within the coming years (8).

One of the most reliable methods to interpret the scientific status of every medical field, including nursing, is to assess the trend of article publication in a specific field (9). Scientometrics is commonly used for the evaluation of scholar scientific works and the respective organizations using available databases (2).

Scientometrics is an efficient method to evaluate scientific performance both nationally and internationally. In this method, national evaluation focuses on the scientific products published in the internal journals of a country, while in the international scale, the main source of assessment is the publication of articles in popular international journals (10). Several scientometric studies have been conducted on Iranian scientific products published countrywide, as well as the international research projects, during different periods of time (6, 11-18).

However, few studies have investigated the contributions of Iranian nursing community to international journals. In one study, Negarande reported that despite the increasing number of scientific projects performed by Iranian nursing and midwifery experts during 2008-2012, limited articles have been published in the journals indexed in PubMed and ISI databases compared to those indexed in Scopus database (7).

In another study on the scientific output of Tabriz University of Medical Sciences, it was revealed that only 3.9% of the produced articles by this university were related to the fields of nursing and midwifery (19). Furthermore, some studies have evaluated the quantitative aspect of nursing articles, as well as their methodology and subjects, in the Iranian journals, the majority of which accounted for the theses of nursing and midwifery students (20, 21).

Devising new plans for future research activities requires descriptive evaluations, production reviews and science distribution assessments. In this regard, observation of the scientific productions by nursing professionals is an efficient approach to determine the range of science-based outcome in this medical field (9). Moreover, a survey of the history of contributions made by the nursing community to science production could disclose the present challenges and horizons over this scientific society (20).

Despite the considerable amount of nursing articles published by Iranian authors in prominent international journals, no studies have been conducted on the quantity and quality of these research projects. In the examination of published articles, there are different parameters to evaluate quality, including impact factor, citation count and citation impact analysis of journals (10).

The present study aimed to determine the publication trends and quality of Iranian articles in the field of nursing and midwifery published in credible international journals during 2000-2011. In addition, we investigated the top-ranking nursing and midwifery schools in terms of the production and development of nursing science.

In this study, we attempted to evaluate the quality of the published articles by Iranian nursing scholars in internationally credible journals based on the parameters of impact factor, citation count and citation impact analysis, as well as the general quantitative aspect of these articles (e.g. number of articles and growth status). The findings of the present study could be a useful source for the scholars and reviewers of nursing articles to gain more information on the status of Iranian nursing science.

Materials and Methods

This descriptive, cross-sectional study was conducted using scientometric methods and data obtained from Scopus database. Using keywords such as Iran and nursing, the search resulted in 886 articles published during 2000-2011. The articles were studied from June 22 to July 17, 2013, and those written by faculty members of Iranian nursing and midwifery institutions were selected for this study. In total, 697 articles were extracted.

Data collection was performed using checklists, the validity of which was approved by a panel of scientometric experts in Mashhad University of Medical Sciences, Iran. The checklists contained information about the article title, publication date, issue number and impact factor of journal, citation

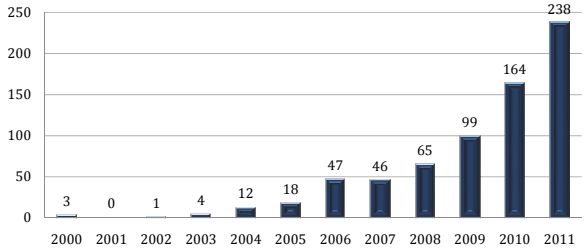

Figure 1. Frequency of Published Articles by Iranian Nursing Scholars in Internationally Credible Journals (2000-2011)

counts and author profile. In order to evaluate the quality of these articles, different parameters including the impact factor, citation counts and citation impact were analyzed.

Citation impact of each nursing and midwifery school was determined by dividing the citation counts by the number of articles published by the school ($\frac{citations}{article\ numbers}$) (11, 22). In addition, number of the nursing faculty members of each school was provided from the records in the websites of these universities. In the universities offering PhD courses of nursing at the time, students of these courses were added to the list of faculty under the category of "compatible scholar" (23).

The PhD candidates who were already a faculty member were considered as such only once. Data analysis was performed using descriptive statistics and Spearman's rank correlation coefficient in SPSS V.16.

Descriptive statistics were used in order to examine the frequency of nursing articles, as well as the mean and standard deviation of journal impact factor and citation counts to articles. Moreover, Spearman's rank correlation coefficient was used to verify the relationship between the total number of authors and citation counts, as well as the relationship between the citation counts and impact factor.

Results

In total, 697 articles were published by Iranian authors in internationally credible journals in the field of nursing and midwifery during 2000-2011. Maximum and minimum amount of these articles were published in 2011 (N=238) and 2001 (N=0), respectively. According to the results of this study, publication trend of these articles has experienced an annual growth of 67% since 2007 (Figure 1).

Over the timeline of this study, Iranian nursing scholars published their articles in 247 internationally credible journals. The forerunning journals to publish these scientific works were Nursing and Health Sciences, Koomesh and HAYAT, respectively. The top 15 journals in terms of the publication of Iranian nursing articles are listed in Table 1.

Out of 145 nursing and midwifery schools in Iran (24), faculty members of 76 colleges have published articles in internationally credible journals. Table 2 shows the top 10 nursing and midwifery schools in terms of publication in internationally credible journals during 2000-2011, accounting for approximately 80% of the total number of published articles.

In this regard, the highest-ranking universities with the publication of 50% of the articles about nursing and midwifery were Tehran University of Medical Sciences, Tarbiat Modares University and Isfahan University of Medical Sciences, respectively. The third column of Table 2 shows the proportion of articles per one faculty member in each school.

Table 1. Top 15 Journals Publishing Iranian Nursing Articles (2000-2011)

Journal name	Frequency and Percentage of Published Articles
Nursing and Health Sciences	**25 (3.6 %)**
Koomesh	**25 (3.6 %)**
HAYAT	**24 (3.4 %)**
International Nursing Review	**22 (3.2 %)**
Iranian Journal of Obstetrics, Gynecology and Infertility	**17 (2.4 %)**
Journal of Babol University of Medical Sciences	**16 (2.3 %)**
Journal of Advanced Nursing	**15 (2.2 %)**
Iranian Red Crescent Medical Journal	**15 (2.2 %)**
Pakistan Journal of Biological Sciences	**15 (2.2 %)**
Eastern Mediterranean Health Journal	**14 (2 %)**
International Journal of Nursing Practice	**13 (1.9 %)**
Acta Medica Iranica	**12 (1.7 %)**
Journal of Research in Medical Sciences	**12 (1.7 %)**
Pakistan Journal of Medical Sciences	**12 (1.7 %)**
Iranian Journal of Endocrinology and Metabolism	**10 (1.5 %)**

Table 2. Ranking of Nursing and Midwifery Schools based on the Frequency of Published Articles in Internationally Credible Journals (2000-2011)

	School Name	Frequency and Percentage of published Articles	Frequency of Faculty Members (N)	Compatible Scholar (N)	Articles per faculty Members
1	Nursing and Midwifery School of Tehran University of Medical Sciences	177 (25.5%)	90	28	1.50
2	Nursing and Midwifery School of Tarbiat Modares University	116 (16.7%)	8	18	4.46
3	Nursing and Midwifery School of Isfahan University of Medical Sciences	52 (7.5%)	59	13	0.72
4	Nursing and Midwifery School of Fars University of Medical Sciences	49 (7%)	32	12	1.11
5	Nursing and Midwifery School of Mazandaran University of Medical Sciences	35 (5%)	23	0	1.52
6	Nursing and Midwifery School of Kashan University of Medical Sciences	30 (4.3%)	18	0	1.66
7	Nursing and Midwifery School of Semnan University of Medical Sciences	26 (3.7%)	15	0	1.73
8	Nursing and Midwifery School of Kerman University of Medical Sciences	25 (3.6%)	19	12	0.80
9	Nursing and Midwifery School of Shahid-Beheshti University of Medical Sciences	24 (3.5%)	15	22	0.65
10	Nursing and Midwifery School of Baqiyatallah University of Medical Sciences	23 (3.3%)	32	6	0.60

Regarding the frequency of articles per faculty member, nursing and midwifery schools of Tarbiat Modares University, Semnan University of Medical Sciences and Kashan University of Medical Sciences were the first three among other universities.

Citation counts and citation impact of articles in each of the nursing and midwifery schools are shown in Table 3. In total, 1853 citations have been made to the articles of Iranian nursing researchers during 2000-2011. The citation counts to the articles published by the faculty members of Tehran University of Medical Sciences (N=679), Tarbiat Modares University (N=475) and Isfahan University of Medical Sciences (N=188) were higher compared to other universities.

Furthermore, comparison of the nursing and midwifery schools in terms of citation impact indicated that Kashan University of Medical Sciences, Tehran University of Medical Sciences and Tarbiat Modares University had the highest proportion of citation impact compared to other universities. The mean of citation impact in these schools was estimated to be 2.9; in other words, each of the Iranian nursing and midwifery schools received about 3 citations on average.

The mean of citation counts to 697 articles published by Iranian nursing scholars was 2.9±5.1. In addition, 291 articles (42%) had no citation counts and in other articles, citation counts were between 1-56, 117 cases of which (17%) received only one citation.

Moreover, one article had the highest number of citations, which was authored by a faculty member of the Nursing and Midwifery School of Tehran University of Medical Sciences (25). Thus, it could be concluded that the mean of citation counts have been on a downward trend since 2006, resulting in the decreased mean of citation counts from 6.14 in 2006 to 0.71 in 2011.

Among the studied articles, 308 cases (44%) had been published in journals with ISI impact factor and others (389 cases) were published in journals without impact factor. The mean of impact factor in the journals publishing nursing articles was 0.97±.062. According to the results of this study, 80 articles (26%) were published in journals with impact factor of <0.5, 88 articles (29%) were published in journals with impact factor between 0.5-1, 119 articles (38.8%) were published in journals with impact factor between 1-2, and 21 articles (6.8%)

Table 3. Ranking of Nursing and Midwifery Schools based on Citation Counts and Citation Impact in Internationally Credible Journals (2000-2011)

		Citation Counts	Citation Impact
1	Nursing and Midwifery School of Tehran University of Medical Sciences	769	4.3
2	Nursing and Midwifery School of Tarbiat Modares University	475	4.1
3	Nursing and Midwifery School of Isfahan University of Medical Sciences	188	3.61
4	Nursing and Midwifery School of Kashan University of Medical Sciences	175	5.8
5	Nursing and Midwifery School of Fars University of Medical Sciences	168	3.4
6	Nursing and Midwifery School of Mazandaran University of Medical Sciences	74	2.1
7	Nursing and Midwifery School of University of Social Welfare and Rehabilitation Sciences	72	3.2
8	Nursing and Midwifery School of Guilan University of Medical Sciences	55	3.66
9	Nursing and Midwifery School of Kerman University of Medical Sciences	52	2.08
10	Nursing and Midwifery School of Tabriz University of Medical Sciences	48	2.6

were published in journals with impact factor of >2. The highest impact factor (3.393) was associated with the Journal of Hospital Infection, the articles of which were written by a faculty member of the Nursing and Midwifery School of Fars University of Medical Sciences (26).

Among the schools of nursing and midwifery surveyed in this study, Tehran University of Medical Sciences, Tarbiat Modares University and Fars University of Medical Sciences had higher ranks in terms of the number of published articles in ISI-indexed journals, respectively. Furthermore, about 45% of the articles published in ISI-indexed journals were authored by the faculty members of the aforementioned universities.

The results of the Spearman's rank correlation coefficient were indicative of a positive correlation between the mean of citation counts and impact factor of the journals ($r=0.37$, $P<0.01$); in other words, increasing impact factor of the journal resulted in an increase in the citation counts to the articles.

In this study, number of authors varied from 1 to 13, and the majority of the studied articles (97.5%) had been written by more than one author. In 453 articles (65%), nurses were the leading authors and in other cases, nurse researchers were the second (91 articles) or third (55 articles) authors. At any rate, Spearman's rank correlation coefficient showed no significant correlations between the number of authors and citation counts to the articles ($r=-0.26$, $P=0.5$). It was also observed that articles with 2 or 3 authors received the highest citation counts, and the mean of citation counts was estimated to be 3 (two authors) and 3.54 (three authors) in these articles. Nonetheless, the mean of citation counts to the articles with more than three authors was calculated to be 2.31.

Discussion

According to the results of this study, the number of articles published by Iranian nursing scholars in international credible journals increased from 3 articles in 2000 to 238 articles in 2011, which is indicative of a remarkable growth over a decade. This ascending trend was considered as a breakthrough in 2011. Furthermore, the findings of this study signify the gradual growth rate of nursing science, along with the increasing rate of scientific production in our country.

Other scientometric studies in the different fields of science have also noted an upward trend in the number of published articles in international journals (6, 15, 27, 28). In addition, quality indicators, such as the impact factor of journal and citation counts to nursing articles, indicated that the qualitative growth of these articles had a less significant improvement compared to the quantitative growth during 2000-2011, so that the mean of impact factor of journals publishing nursing articles during this period experienced a minor change. On the other hand, the mean of citation counts saw a noticeable decline during this period, with 42% of the articles

receiving no citations.

In one study, Rezai Ghale et al. evaluated the qualitative and quantitative changes in the Iranian medical articles published in international journals during 1992-2002 using impact factor as the main criterion. According to their findings, the quantity of national medical research had a significant improvement during this period, while no significant changes were observed in the quality of these articles (27). Therefore, nursing researchers need to make further attempt to produce high-quality scientific articles for international journals in order to expand the body of nursing knowledge.

Impact factor is one of the most important quality indicators to evaluate the scientific validity of journals. The quality of the journals in which researchers publish their articles is considered as a viable indicator of research quality as well (10, 17). According to the results of the present study, 308 articles were published in ISI-indexed journals in total, and the majority of these journals (93.2%) had an impact factor of <2, while 26% had an impact factor of <0.5.

In the current study, the mean impact factor of journals publishing Iranian nursing articles was estimated to be 0.97±0.62, which is higher than that of the international journals of nursing indexed in the ISI database (0.94 ± 0.46) (29). This indicates the quality of published Iranian nursing articles in international journals to be between moderate to high within the timeline of this study.

In a longitudinal analysis of bibliometric and impact factor trends among 7 international journals of nursing during 1977-2008, Smith reported that the citation counts to nursing journals, as well as their impact factor, had been on a steady rise over the past 32 years. Additionally, he concluded that published nursing research had been increasingly observed, heard and cited by different international academic communities (30).

One of the limitations in the field of nursing regarding the ISI ranking system is that only a small proportion of nursing journals have been ranked in the ISI database. With respect to the Iranian journals published by nursing and midwifery schools, Isfahan Nursing and Midwifery College is the only school to have published their journal rated as Thomson Reuters in ISI.

Nursing researchers have succeeded to publish their articles in 247 credible international journals during 2000-2011, 119 of which are ISI-rated journals, and 33 (28%) are classified under the subject area of nursing. According to the ISI and Web of Science, there are 99 international nursing journals with significant impact factor (29). This means that Iranian nursing scholars have managed to publish their research projects in as much as one-third (33%) of the nursing journals indexed in ISI, and 78% of these articles have been published in non-nursing journals.

It could be presumed that Iranian nursing researchers were less renowned in specific nursing journals indexed in ISI, or their articles were accepted less often in these journals. The first assumption seems to be more realistic, since some of these articles were published in journals with high impact factor. Therefore, it is necessary that nursing researchers become more familiar with the journals related to the nursing profession through workshops, so that they acquire new skills to improve the quality of their articles to be published in such journals.

The majority of the articles authored by Iranian nursing scholars have been published in the three following journals: Nursing and Health Sciences, Koomesh and HAYAT. Approximately 11% of these articles were published in these journals during the study period.

Regarding the mean impact factor determined by the nursing journals of ISI database (29), the aforementioned journals have been rated lower; HAYAT and Koomesh journals are not indexed in ISI, and Journal of Nursing and Health Sciences has an estimated impact factor of 0.684.

In one study, Wilkes et al. evaluated the trend of published articles authored by Australian nurses observing a significant increase in the number of articles published during 2004-2008. The main journals publishing these articles were Contemporary Nurse, Journal of Advanced Nursing and Journal of Clinical Nursing, respectively, all of which are ISI-indexed journals (17).

In another study, Erdmann et al. assessed Brazilian

journals and the scientific production of the nurses in this country. According to their findings, with the increasing scientific production in the field of nursing in this country, Brazilian journals pushed their efforts to join the international scientific community including Web of Science, MEDLINE and Scopus. In addition, it was emphasized that researchers needed to improve the quality of their scientific work and curate support for the scientific production in order to achieve high-quality research work and become indexed in international databases (1).

Therefore, it may seem necessary to encourage Iranian nursing researchers to publish scientific articles in journals with high impact factor, supporting a greater incentive to further motivate researchers in this regard.

Citation count is another prominent quality indicator in the field of science, which signifies the effectiveness of scientific production. This index is of great importance since it calculates the quality of research using quantitative elements; thus, it has to be taken into account along with other confounding variables (e.g. number of articles) in the evaluation of research quality (11).

For instance, increasing production of scientific work might lead to an increase in the citation counts, and a significant correlation has been found between these two indices by several researchers (31). The findings of the present study indicated that the two indicators of citation counts and article frequency have an insignificant effect on the ranking of nursing schools in international journals; therefore, Nursing and Midwifery School of Tehran, Tarbiat Modares University and Isfahan University remained the leading universities with regard to the publication of nursing and midwifery articles.

Citation impact is another ranking parameter, which is used to eliminate the effect of article quantity. This index is calculated by dividing the citation counts by the number of articles. Therefore, citation impact has a higher reliability in the assessment of scientific work since it neutralizes the effect of article frequency as an insignificant parameter (11).

With respect to the level of scientific production, universities with lower production and higher citation impact may become marginalized, which leads to a tendency to increase the quantity of their scientific products. For instance, the School of Nursing and Midwifery of Kashan University of Medical Sciences has been scored six and has the fourth ranking based on indicators such as article frequency and citation count. However, the citation impact of the articles published by this university has achieved the first rank.

In recent years, the quantity of scientific products has attracted great attention in Iran. In the evaluation of scientists, researchers, universities and other international institutions, this parameter is considered to be significant. However, this may eventually lead to the production of low-quality studies, which only focus on the quantity of research without considering the universities and institutions with high-impact publications.

Scientific production and citation counts are mostly associated with a small proportion of nursing and midwifery schools; accordingly, about 73% of scientific work and 72% of citation counts belong to eight schools of nursing and midwifery (Tehran University of Medical Sciences, Tarbiat Modares University, universities of Isfahan, Fars, Mazandaran, Kashan and Kerman, and the University of Social Welfare and Rehabilitation Sciences).

These universities account for only 6% of the schools of nursing and midwifery in Iran, many of which have faculty members of type A in their employment. Previous studies in this regard have indicated that medical universities offer different levels of production in scientific work (11). Furthermore, financial and educational support needs to be provided for type B and C nursing schools.

This approach may increase the ability of researchers of these institutions to publish their scientific articles in credible journals and become motivated to be further engaged in this area.

According to the other results of this study, the School of Nursing and Midwifery of Tehran University of Medical Sciences was ranked first among ten other nursing schools by publishing 177 articles during 2000-2011. Moreover, studies in other areas of medical science have indicated Tehran University of Medical Sciences to be the leading

school in the production of scientific research in our country (11, 15).

In one study, Alijani et al. investigated the level of scientific production in the Iranian surgeons' community in ISI database during 1998-2007. According to their results, researchers in Tehran University of Medical Sciences surpassed other medical experts of the country by establishing 126 articles (17.1%) during this period (15). The main reason for this remarkable success is the presence of the highest levels of education in this university, as well as the integration of Tehran University of Medical Sciences with Iran University of Medical Sciences in this study.

Among the other factors improving the production and citation counts received by this university are the credit and research budgets allocated to Tehran university, different research centers, and extensive coverage of different fields of science by the researchers of this university (11).

Several studies have suggested that co-authorship could noticeably improve the quality of scientific articles (32). In a study by Hassan Zadeh et al. on the assessment of co-authorship in Iranian articles indexed in ISI journals, a significant correlation was observed between the number of authors and article citation counts. On the other hand, the results obtained by the study of Hart within a period of 10 years using library sources were not indicative of any significant relationships between co-authorship and the quality of published articles (33).

In a bibliometric study of scientific output in Tabriz University of Medical Science, Biglu claimed that most of the faculty member of this university (69.3%) had to publish their scientific products individually (19).

In the current study, no correlation was found between the number of authors and citation counts; however, articles with two or three authors were observed to receive the highest citation counts. However, articles with two or three authors were cited more often than those written by more authors. This is suggestive of the fact that the increasing number of authors may have an adverse effect on the cooperation, coherence and quality of scientific research.

Medical articles by Iranian nursing scholars have been published in 247 international journals, which suggests that the topic areas and journal targets of Iranian nursing researchers is varied and extensive. In this regard, Moradi et al. evaluated the quality of Iranian articles indexed in ISI database in the field of nanotechnology, and their findings were compatible with the results of the present study (34).

With respect to scientific production, the nursing and midwifery school of Islamic Azad University was observed to have the least significant part in international journals with 697 published articles, 76 of which (11%) were affiliated to the nursing and midwifery faculty of this university. In another study, Mousavi et al. reported that the Islamic Azad University had published 3106 scientific articles, indexed in the Web of Science, over a 10-year period from 1999 to 2008. Among these products, 14 articles (4.98%) were written in the fields of dentistry, oral surgery and medicine (35).

As a result, Islamic Azad University needs to procure high-quality production of scientific outputs, especially in the field of nursing, through the recruitment of qualified faculty members, as well as prioritizing and strengthening research programs to provide the opportunity for the cooperation of other faculty members in research projects.

One of the main limitations of the current study was lack of access to a comprehensive database with lists of faculty members in the medical universities of the country. Some university websites were devoid of adequate information on the number of faculty members and PhD students.

Another limitation of this study was the sheer emphasis on nursing articles published in journals indexed in the Scopus database. Scopus incorporates a wide range of articles compared to other databases, such as PubMed and Web of Science, while offering a broader spectrum of citation analysis compared to the Web of Science (36). Nevertheless, we were not able to access these two databases during the time of this study.

The results of the current study could be used to determine the status of nursing in the global science and provide valuable information for future planning, as well as ongoing improvement to increase the

quality and quantity of nursing scientific articles. In general, it could be concluded that the production of knowledge in the field of nursing has been growing remarkably. In this regard, factors such as support for academic research projects, financial reward to the published articles, constructive changes in the promotion of faculty members, easy access to various databases and increased admissions in nursing graduate courses may be effective (6, 37). The quality of articles published in international journals has hardly made any progress during recent years, and there has been a downward trend in different quality indicators of these scientific productions, such as citation counts.

Several studies have confirmed the gap in the quantity and quality of nursing scientific products. Therefore, incentive policies are required as to increase the number of nursing articles and improve the quality of these products, which lead to the increased number of nursing articles published in high impact factor journals, and higher citation counts and citation impact by nursing research productions.

The following recommendations are proposed in order to enhance the quantity and quality of nursing scientific productions in nursing and midwifery schools:

- Implementation of educational courses on the publication of articles in credible scientific journals;
- Encouragement of nursing researchers to present their articles in journals with high impact factor and receive more citation counts;
- Increasing research budget in the field of medical sciences and establishing new research centers in low-ranking universities;
- Examination and verification of effective parameters in the disparate distribution of published articles by nursing researchers of medical science universities countrywide;
- Encouragement of managers and editors of internal nursing journals to index scientific products in well-known indexers, such as ISI, PubMed and Scopus;
- Promotion of co-authorship by nursing scholars to improve the outcome of nursing research projects, as well as the quality of these scientific products.

Conflicts of interest

There were no conflicts of interest in this study.

Author's contributions

All authors participated in writing the scientific proposal, data collection and writing the manuscript. All authors read and approved the final manuscript.

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