

Publication productivity of Allied Health Professions in an Italian Local Health Authority: prevalence and bibliometric analysis

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Abstract. *Background and aim of the work:* Despite Allied Health Professions (AHPs) represent a substantial part of workforce within the health system and they might give a relevant contribution to research, literature on publication productivity of AHPs working in non-research/academic institutions is scarce. The aim of this investigation was to provide point prevalence of AHPs working in a non-research/academic setting who have written at least one article published in indexed journals, in order to describe their scientific productivity. *Methods:* A descriptive cross-sectional study was carried out of AHPs working in large Local Health Authority in Italy, who published in journals indexed in Scopus and/or PubMed. H-index, publications and citations number, journal name, publication year, and journal Impact Factor were extracted. *Results:* Fifty-two AHP workers were identified as authors, having published 105 articles between 1993 and 2019. The number of papers increased over the years ($p < .001$). Published papers in journals with Impact Factor were 67.6% ($n = 71$) of the total, with a median Impact Factor = 2.676 (range = 0.583 – 59.102). The median number of citations was 4 (range = 0 – 99). The prevalence among units ranged from 0.8% to 5.0%, 2.9% in the whole department. There were not significant differences in number of articles ($p = .138$), citations received ($p = .337$), and H-Index ($p = .661$) among units. *Conclusions:* In the Local Health Authority under investigation, publication productivity of AHPs workers was found to be low, although it is increasing over time, with no significant differences among units. Further investigations should be carried out to link these results with authors' information and organizational characteristics to study the relationship between authors' profiles and publication productivity. (www.actabiomedica)

Key words: Allied Health, Bibliometrics, Authorship, Scientific output indicators.

Introduction

The Italian National Health System (SSN) is a complex organization of health facilities and services which includes University hospitals, Scientific Institutes for Research, Hospitalization and Healthcare (IRCCS) both with a specific research mission, and Local Health Authority, mainly addressed to care activities.

Consequently, academic or research institutes generally have a higher likelihood to perform and publish medical research findings, when compared to non-research/academic institutions.

In Italian Local Health Authorities, Allied Health Professions (AHPs) are district health professionals from medical doctors, dentists or nurses (1), and includes several different healthcare professions

involved in the care process who represent a relevant portion of health professional workers.

In Italy, 19 different AHPs are recognized by the Ministry of Health (2). In general, AHPs have been reported to have low support, grants, and opportunities to be involved in research activities (1).

A recent study highlighted a lack of praxis in research in these professional groups, due to insufficient training. The same article also outlined that AHPs directors are not always aware of the importance of supporting and monitoring research activities to improve the quality of health services and the advancement of knowledge in clinical practice (3).

Authors publishing in the field of physiotherapy are most frequently working in non-research/academic institutes (4, 5). However, the few physiotherapists who work in research/academic organizations had higher bibliometric indicators, they were most often involved in publishing and they received more citations than clinicians (6, 7). In addition, in the United States, AHPs research funding is considered inadequate, compared to medical and nursing fields (8).

Although AHPs represent a substantial part of the workforce within the SSN and they might give a relevant contribution to research, literature on publication productivity of AHPs working in non-research/academic institutions is lacking.

Aim

The aim of this investigation was to identify the prevalence of AHPs working in non-researcher/academic settings and who have written at least one article published in a peer-review journal indexed in the Scopus or PubMed databases, in order to describe their scientific productivity.

Methods

Sample

This was a descriptive cross-sectional study. The study population was represented by all workers belonging to the Department of Allied Health Professions of a large Local Health Authority in Italy,

providing health services to a population of approximately 1,500,000 inhabitants in a geographical area of 5000 square km and it employs over 14,000 people (9).

The Department of Allied Health Professions includes 4 main units: rehabilitation (including Physiotherapists, Podiatrists, Occupational Therapists, Orthoptists, Speech and Language Therapists, Psychiatric Rehabilitation Technicians, Professional Educators, Childhood Neuro and Psicomotricitists), biomedical laboratory, Radiology, Environment and Workplace Prevention. Other AHPs (Dietitians, Dental Hygienists, Health Visitor, Neurophysiopathologists Technicians, Audiometric Technicians, Orthotic and Prosthetic Technicians) are grouped in a different unit.

Procedure

On the proposal of the Directors of each organizational unit, the Director of the Department of Allied Health Professions sent an email to all health workers within each unit of the Department, who were active up until December 2019 (n = 1.760), asking to those who were authors in at least one article to indicate all the papers that they had published in a journal indexed in Scopus and/or PubMed until December 2019.

After deleting duplicates generated by authors' collaboration, the following data were extracted: journal name, publication year, number of citations received, and journal Impact Factor (IF). For each author, the following data was extracted: total number of publications, number of citations received, and H-index. In this study, the number of citations was extracted by the Scopus database (December 2019) and the Web of Science 2018 IF values were used.

Statistical analysis

The Chi square test or Fisher's exact test, when at least one expected frequency is less than five, were used to compare the number of authors and publications among different units. To represent the data collected, Median (with interquartile range [IQR] and range of values), percentage, and ratio values were used. The correlation between year and number of published articles was estimated by the Spearman rank-order correlation

coefficient (ρ). The Kruskal-Wallis test was used to analyze differences between units in H-Index, number of publications and number citations received by each author. Data analyses were performed using the SPSS package 20.0 for windows. The level of statistical significance was set at 0.05.

Results

Fifty-two workers were identified as authors, having published 105 articles between 1993 and 2019. The number of papers reported in the publication of reference increased over years ($\rho = 0.640$, $p < .001$) (figure 1).

Articles published in journals with IF were 67.6% ($n = 71$) of total articles, with a median IF = 2.676 (IQR = 2.054 – 4.290, range = 0.583 – 59.102). The median number of citations was 4 (IQR = 0 – 19.5, range = 0 – 99).

Among units, prevalence ranged from 0.8% to 5.0%, 2.9% in the whole department (Table 1).

The number of authors was higher in Rehabilitation ($n = 20$) and Laboratory ($n = 17$) units ($p < .001$), while the number of papers published was higher in the Rehabilitation ($n = 57$) and Laboratory and Prevention units (both $n = 15$) ($p < .001$).

The median of publications per author, number of citations per author, and H-index, in the whole sample and in different units, are reported in table 2. There were not significant differences in number of articles ($p = .138$), citations received ($p = .337$), and H-Index ($p = .661$).

Discussion

The publication productivity of AHPs working in a non-research/academic setting was investigated, using the number of publications per author, the number of citations received per author, and the H-index as outcomes. Even though quantitative bibliometric indexes have been frequently criticized and debated (10, 11), they are still widely used to assess performances of researchers, journals, and universities. They are frequently considered by researchers as the most useful measure of impact and are currently used as criteria to select university professors in Italy (12).

Academic or scientific institute affiliations could facilitate initiatives and opportunities, establishing contacts between colleagues, producing new publications and sharing knowledge (5, 13).

In fact, AHPs can support and improve the translation of research evidence into clinical practice to

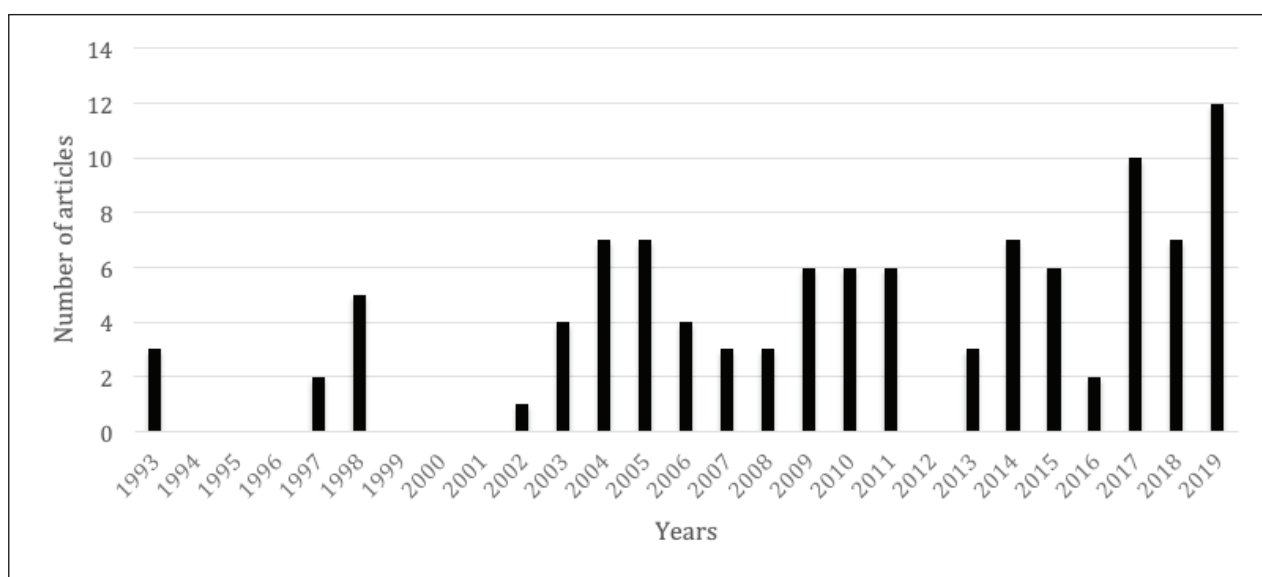


Figure 1. Number of articles per year

Table 1. Authors/population ratio

Unit	Professions	Population	Authors	Authors/population ratio (percentage)
Rehabilitation	Physiotherapists, Podiatrists, Occupational Therapists, Orthoptists, Speech and Language Therapists, Psychiatric Rehabilitation Technicians, Professional Educators, Childhood Neuro and Psycomotricitists	561	20	3.6%
Radiology	Radiographers	330	5	1.5%
Laboratory	Biomedical Laboratory Technologists	340	17	5.0%
Prevention	Environment and Workplace Prevention Technicians	382	3	0.8%
Others	Dietitians, Dental Hygienists, Health Visitors, Neurophysiopathologist Technicians, Audiometric Technicians, Orthotic and Prosthetic Technicians	147	7	4.8%
All		1.760	52	2.9%

Table 2. Distribution of number of publications per author, number of citations received per author, and H-index.

	All authors	Rehabilitation	Radiology	Laboratory	Prevention	Others
Articles published per author						
Median	1	1.5	1	1	4	1
Interquartile Range	1 -3	1 – 2.25	1 -2	1 -2	4 -5	1 -2
Min-Max	1 – 37	1 – 37	1 – 2	1 – 4	4 – 6	1 – 7
Number of citations						
Median	9	10	2	25	3	10
Interquartile Range	2 – 49	0.75 – 93	2 – 11.5	6.75 – 57	2 – 205	4 – 11.5
Min-Max	0 – 587	0 – 587	0 – 8	0 – 128	1 – 407	1 – 29
H-index						
Median	1	1	1	1	1	1
Interquartile Range	1 – 2	0 – 1	1 – 1.5	1 – 2	1 – 1.5	1 – 1.5
Min-Max	0 – 14	0 – 14	0 – 2	0 – 4	1 – 2	1 – 2

optimize patient outcomes, as well as encourage inter-professional teams and multidisciplinary care (14). Moreover, it is well known that a research culture is associated with greater services efficiency and efficacy from both clinical and organizational perspectives (15).

Despite the fact that the study was conducted in a non-research/academic institution, the data highlights an improvement of performances in scientific publication productivity of AHPs over the years. However, the prevalence of authors of scientific papers among

AHPs is still very low. A number of barriers to research involvement have been reported, including lack of time, individual motivation and lack of skills (16). This is despite AHPs generally declaring interest in conducting research. Commonly reported extrinsic factors are lack of time because of competing clinical priorities and workloads, lack of funds and infrastructure, lack of support from colleagues and managers (17). Barriers were not investigated in this study, but we can assume that many of these factors might explain these results.

Since AHPs of Local Health Authority are involved in almost all clinical pathways, they are able to systematically collect and analyze a high number of data relating to several health problems in order to improve clinical care and scientific knowledge. The environmental and organizational context should further support AHPs involved in research activities and promote education on research skills. The creation of an allied health research unit could improve participation in research (18) and encourage multidisciplinary investigations.

Differently from what had been expected (1), there were not significant differences in the bibliometric indicators across the professions. However, this result may be due to the small sample size and should be interpreted with caution.

Conclusions

Two main factors might play a role in the underestimation of the number of authors and publications. The data collection was done by creating an email chain and it was not possible to check if the request for information was indeed received by all workers. In fact, non-active workers (for example retired workers) were excluded from the sample and the number of potential authors and publications might therefore have been underestimated. The lack of authors' information (years of experience, education) and organizational characteristics collected represent an additional limitation. Further development of this study should include a more systematic data collection as well as the analysis of the relationship between author's profiles and publication productivity.

Publication productivity of AHPs working in a non-research/academic institution is low, but it is increasing over time, with no significant differences among units. Health policy makers should further support research activities considering that research is in itself able to foster culture and knowledge, as well as stimulate a scientific method of approach to problems, generate a habit to comparison, and disseminate strategies for the health care and operation, management and organization of clinical services and practices.

Further investigations should link these results with authors' information and organizational

characteristics to study the relationship between authors' profiles and publication productivity.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g., consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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Received: 28 September 2020

Accepted: 25 January 2021

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