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AIGO research output: A potential matter for postgraduate non-academic hospital specialist training in gastroenterology

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Letter to the editor

Dear Editor,

For several years, the Italian Ministry of Instruction, University and Research (MIUR) has included a number of public, non-academic hospitals in the training network for postgraduate schools in the field of digestive diseases [1]. Despite the recent redefinition of standards and performance indicators for institutions in the training network [1], there are concerns about the quality of the training provided in hospitals, which are challenged in carrying out scientific activities for lack of resources. The training includes both practical skills and notions. While the effectiveness of practical training is immediately evident, notional transmission is difficult to measure. Because a substantial knowledge of the scientific literature is needed to write scientific articles, the output of research articles can be used as a surrogate for theoretical notions. Although this practice is debated, the number of published articles and their citations have been used to assess, at least in part, the quality of scientific production on the national scale [2,3].

An analysis of published articles can also be used to assess the quality of training in a specific medical specialization, such as digestive diseases. The Associazione Italiana Gastroenterologi e Endoscopisti Digestivi Ospedalieri (AIGO; www.webaigo.it/) is a sci-

entific society that was established in 1969 by gastroenterologists working in community hospitals for the Italian National Health System. The mission of AIGO is to improve clinical practice and support research [4]. Currently, over 1500 specialists, from several gastroenterology (GI) units located throughout the country, are AIGO members. The provision of care by this community of specialists is well documented by the performance indicators provided by the Ministry of Health [5]. On the contrary, the research activities in GI units have not yet been surveyed, so there is a lack of knowledge about the effectiveness of theoretical training of these specialists. Therefore, this study evaluated the scientific publications of AIGO members as a means to assess the quality of their training. For this study, we accessed the member database of AIGO members. Only those gastroenterologists in compliance with payment of the association's annual dues were included in the analysis, to exclude people who no longer work in hospital or who are retired. We collected, for each active AIGO member, surname, initials of the first name, institutional affiliation (including city), Open Researcher and Contributor ID (ORCID). These data were used to identify their published articles, namely research articles, reviews, letters and editorials, from January 1, 1980 to January 20, 2020. Bibliographic research was done using the Web of Science (WOS) database [6]. ORCID and city data were used as search terms only for AIGO members with common names. To focus on GI research, the search results were refined using the following search string: category of journals (gastroenterology & hepatology) combined with the Boolean operator OR (= logical sum); search by topic related keywords (hepatocellular OR stomach OR

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¹ The members of the Governing Board of AIGO 2018-2020 can be found in the Appendix.

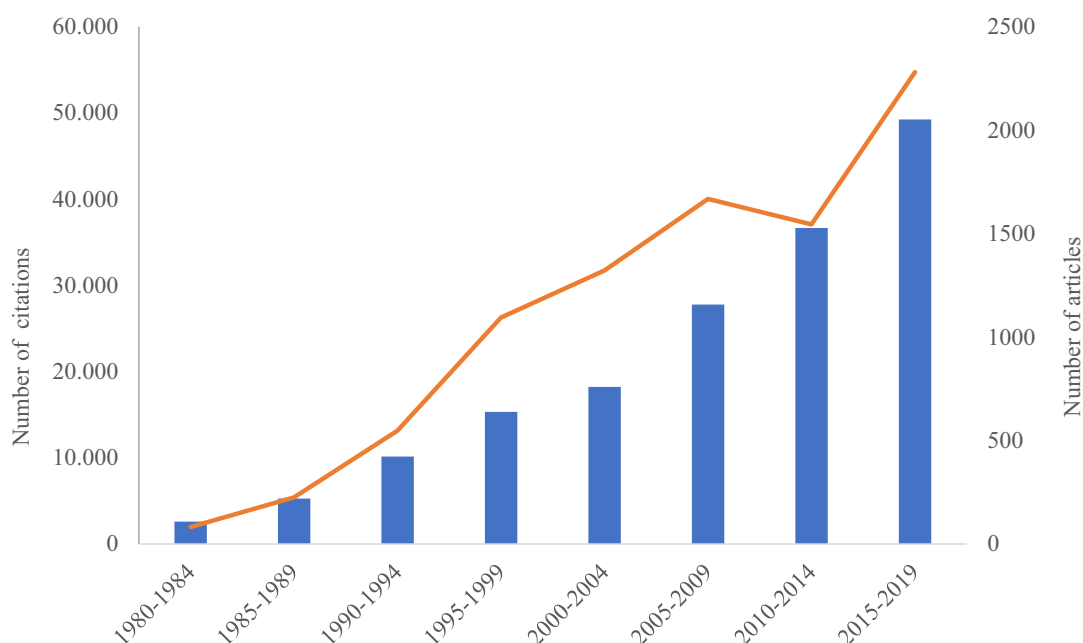


Fig. 1. The number and citations of articles published by AIGO members, between January 1, 1980, and January 20, 2020. The line indicates the number of citations. The bars indicate the number of articles.

esophag* OR oesophag* OR colon OR colonic OR rectal OR colorectal OR endoscop* OR bowel OR celiac OR crohn OR helicobacter OR microbiota OR pancreas OR pancreatic OR ulcerative) OR (hepatic AND liver) OR (gastr * OR digest* OR biliary OR spleen OR abdom* OR intestinal) AND=gastr*) and, always with the Boolean operator OR - search for cross publications at gastr * OR abdom * in the authors address - further filter with "Italy" OR "gastroenterol" + "abdom *" in the authors address, added to a search with AIGO in any field. Results of the first stage of research were imported into InCites, the analysis tool of the WOS platform, for evaluation. Data on the funding agencies that sponsored the research were recorded. For each article included in the WOS Core Collection (WOS CC), four bibliometric indicators were assessed, namely times cited, self-citations, Journal Normalized Citation Impact, and Journal Impact Factor (IF). Data on the journals in which articles were published and the distribution of articles in the 25 main WOS research areas were obtained. For identified articles included in the WOS CC, we calculated the overall *h*-index, average citation count, mean Journal Normalized Citation Impact and median IF.

The 618 currently active AIGO members had published a total of 7007 WOS-indexed articles in the considered period. Of these articles, 92% did not indicate any support from research grants. Among the 645 articles acknowledging research funding, as many as 411 (63.7% of all articles) acknowledged funding from academic or governmental agencies, while the remaining had sponsorship from pharmaceutical companies. Only 64 articles of the entire dataset were not included in WOS CC, and were excluded from further analysis. Therefore, 6943 articles were used in the assessment of research quality. The number of articles published per year by the AIGO members increased over time, from 108 articles in the period 1980–1984 to 2051 articles in the period 2015–2019 (Fig. 1). The citation report revealed that these articles had been cited 192,211 times; after removal of self-citations, the total citations numbered 180,312. The *h*-index for the dataset was 165. The average citation count per item was 29.4 (range, 1–2274). The mean Journal Normalized Citation Impact was 1.21 (range, 0.02–75.4). There was a clear increasing trend in citations from 1980 to 2019 (Fig. 1). According to the WOS research areas, 4256 articles (61.3%) had been published in journals dedicated to gastroenterology and hepatol-

Table 1

Five-year period total and median Impact factor (IF).

Years	Total papers (n)	Total IF	Median IF
1980–1984	56	527.2	7.23
1985–1989	137	1430.5	7.23
1990–1994	289	2260.7	3.88
1995–1999	500	3926.0	4.46
2000–2004	725	4960.0	3.76
2005–2009	1115	6649.5	3.63
2010–2014	1491	7565.1	3.35
2015–2019	1889	9398.5	3.38

ogy, 746 (10.7%) surgery, 548 (7.9%) oncology, 463 (6.7%) pharmacology and pharmacy, and 225 (3.2%) to internal medicine. Among the gastro-hepatology articles, 2477 were about the digestive tract, 1064 about liver, 494 about pancreas, and 1379 about GI cancer. Of the 6943 articles, 6202 (89.3%) had been published in journals indexed for IF. The total IF was 367,197.7 with a median IF of 3.5 (range, 0.1–70.7). Table 1 reports the five-year period total and median IF, starting from 1980 until 2019. Of these articles, 3278 (52%) had been published in journals dedicated to gastroenterology and hepatology, followed by oncology (441 articles, 7.0%), endoscopy (409 articles, 6.5%) and inflammatory bowel disease (88 articles, 1.4%). The most common journal venues are given in Table 2.

To the best of our knowledge, this is the first study to provide data on the scientific achievement of a national Scientific Society. Our data found a substantial scientific output by AIGO members, which progressively increased from 1980 to 2019. Similarly, the number of citations to these published articles increased over time with a mean (1.21) of Journal Normalized Citation Impact that exceeded 1, suggesting an overall good performance of publications [7]. The scientific output was mainly clinical, as only 5% of the articles had been published in basic science journals. The median IF (3.33) of journals in which the articles were published in the period 2014–2018 was higher than the median IF (2.82) of the same period for the 84 journals belonging to the gastroenterology and hepatology category of WOS [8] indicating that the impact value of the scientific production of the AIGO members follows the

Table 2
Journals in which AIGO members published articles, from 1980 to 2020.

Journal	Articles, n (%)
*Digestive and Liver Disease	765 (12.3)
American Journal of Gastroenterology	242 (3.9)
World Journal of Gastroenterology	194 (3.1)
Alimentary Pharmacology Therapeutics	192 (3.1)
Endoscopy	192 (3.1)
Hepatology	176 (2.8)
Journal of Hepatology	172 (2.8)
Digestive Diseases and Sciences	159 (2.6)
Gastrointestinal Endoscopy	150 (2.4)
Gut	137 (2.2)
Gastroenterology	134 (2.2)
European Journal of Gastroenterology and Hepatology	121 (1.9)
Scandinavian Journal of Gastroenterology	92 (1.5)
Others	3476 (56)
Total ^a	6202 (100)

* Previously named *Italian Journal of Gastroenterology and Hepatology* and *Italian Journal of Gastroenterology*. ^a Limited to the 6202 articles published in journals indexed for IF.

average trend of the impact factor in the same category profile. Moreover, the citation impact and the median IF of articles published by AIGO members are in keeping with those reported for the Italian scientific production in gastroenterology and hepatology in the same time frame [3,9,10]. There are some limitations to this study. Author name disambiguation is a challenging process, so we cannot exclude that some errors were made in identifying articles. However, we used as search terms not only surname and first name, but also affiliation (hospital), city, ORCID and topical key words to increase the specificity of our bibliographic research. Since we excluded AIGO members who had not paid the annual membership fee, selection bias is possible. This methodological choice was made to limit our search to members who are actively working in hospital.

In conclusion, this study indicates that, in Italy, a substantial clinical research in gastroenterology is performed in public hospitals. The scientific achievements of AIGO members is a good surrogate of quality for training within the network of the postgraduate specialization schools in digestive diseases.

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Appendix. *Governing Board of AIGO 2018–2020

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