



Physical activity and sports sciences field in Italian scientific research products and its distinct composition in biomedicine, exercise and sports sciences and pedagogy domains

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Abstract

Purpose This study aims to measure the number of scientific production of Italian professors, as framed on academic disciplines of Physical training and methodology (code M-EDF/01) and Sport sciences and methodology (code M-EDF/02), afferents to academic recruitment field of Exercise and sports sciences (code 06/N2) and Didactics, special education and educational research (code 11/D2).

Methods The sample consisted of the entire population of full professors ($n = 30$) of M-EDF/01 and M-EDF/02, plus a proportional representation of the two academic recruitment fields with at least one associate professor per university, for a total of 78 professors. The titles of the first ten scientific products in terms of more citations from the Google Scholar database were analysed for each scientist. The title's full coherence at the scientific declaration of the two academic disciplines of M-EDF/01 and M-EDF/02 and biomedicine and pedagogy domains were assessed. One-way ANOVA with Bonferroni post hoc test was used to compare the two academic disciplines of the two academic recruitment fields with the three domains to highlight the separated data's greater, average and lesser significance.

Results The aggregate data showed a prevalence of the biomedicine domain over the sport and physical activity ones in M-EDF/01 and M-EDF/02 in the academic recruitment field of 06/N2. On the other hand, in the academic recruitment of 11/D2, there was a prevalence of sport and physical activity domain over the biomedicine ones. In addition, a modest pedagogy scientific production in 06/N2 and biomedical in 11/D2 were found.

Conclusion The existence of the problem of the different coherence of the scientific profiles of the researchers concerning the relevant academic recruitment field and possibly also to the two academic disciplines was confirmed.

Keywords Academic disciplines · M-EDF/01 · M-EDF/02 · Academic recruitment field · 11/D2 · 06/N2

Introduction

Exercise and sport sciences have been part of the academic organisation since 2001 with two different academic disciplines. These are Physical training and methodology (code M-EDF/01) and Sport sciences and methodology (code M-EDF/02) that delimit the domain of research and training

[1]. These academic disciplines are based and characterised by bachelor's degree, master's and doctoral degree in Exercise and sports sciences. The transformation of the three-year degree courses (bachelor's degree) of the Higher Institutes of Physical Education (ISEF) into degree courses (master's degree) in Exercise and sport sciences took place, according to article 17, paragraph 115, of the law of 15 May 1997, n. 127 to develop research in the field of physical activity and sports sciences [2]. To help produce more expert coaches at the participation and performance levels, a number of governing bodies have established coach mentoring systems [3]. The aim is twofold. First, it is to advance the case for activity theory as a credible and alternative lens to view and research sports coaching. Second, it is to position this assertion within the wider debate about the epistemology of coaching [4]. Furthermore, with the sport's reform, the new professional profile of the

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kinesiologist was established, access to which is only allowed to graduate of sport sciences of the courses L-22, LM-67 and LM-68 [5]. Therefore, the study plans of the 3 degree courses, in addition to being consistent with the training objectives of the physical education teacher, also need to be compatible with the profile of the kinesiologist.

The two academic disciplines are numerically autonomous, thanks to the contribution of biomedicine and pedagogy disciplines. However, these last have contributed to dividing the two academic disciplines (M-EDF/01 and M-EDF/02) into two academic recruitment fields that have different declaratory for evaluating the different scientific profiles of researchers through the selection procedures for recruitment [6]. These are Exercise and sports sciences (code 06/N2) and Didactics, special education and educational research (code 11/D2) [7]. This dichotomy, between formation and research on the one hand, and the selection of scientific profiles, on the other hand, entails divisive consequences depending on whether the researchers refer to one of the two academic recruitment fields [8–10]. This dichotomy also creates the misunderstanding that the two academic disciplines, in effect, are only one for academic recruitment fields: educational-didactic-sports for M-EDF/01 in 11/D2 and performance-evaluative-sports for M-EDF/02 in 06/N2 [11, 12]. For this problem, a preliminary examination should be carried out on the entire scientific production of the professors in the two academic disciplines, with aggregated data for the academic recruitment field and disaggregated for academic discipline within the academic recruitment field.

Although observation and other data sources have been given some attention in the mixed methods research literature, few researchers have applied accurate observational research methods [13]. In recent years, however, there has been a surge in the number of empirical studies involving the application of mixed methods research designs rooted in systematic observation in the field of Exercise and sport sciences [13, 14]. A preliminary study is first required on a representative sample and using appropriate procedures to verify its feasibility.

Therefore, this study aims to verify the measurement of the coherence of the scientific production of the Italian professors assigned to the two academic disciplines and academic recruitment fields by quantifying scientific products in the Sport and Physical activity domain and that of biomedicine and Pedagogy affinities.

Materials and methods

Study participants

The sample was made up of the entire population of full professors ($n = 30$) of Physical training and methodology

(M-EDF/01) and Sports sciences and methodology (M-EDF/02), plus a proportional representation of the two academic recruitment fields (06/N2 has professors seven times more than 11/D2) with at least one associate professor per university in M-EDF/01 or M-EDF/02, for a total of 78 professors.

Procedures

For each unit of the sample, the titles of the first ten products with major citations from the Google Scholar (GS) database were analysed to assess the full coherence of the titles with the two academic disciplines of M-EDF/01 and M-EDF/02 and with the pedagogy and biomedicine domains. The use of the GS database is justified by the automatism with which all scientific products on the net are immediately hooked up with relative citations.

Statistical analysis

The distribution of normality was initially verified with the Shapiro–Wilk test ($P > 0.05$). Subsequently, one-way ANOVA with the Bonferroni post hoc test was used to compare the two academic disciplines of the two academic recruitment fields with the three domains to highlight the separated data's greater, average and lesser significance. Data analysis was performed using Statistical Package for Social Science software (IBM SPSS Statistics for Windows, version 27.0. Armonk, NY).

Results

For the academic discipline of M-EDF/01 in the academic recruitment field of 06/N2, a significant difference was recorded only in the Biomedicine/Sport and Physical activity domains ($P = 0.000$) and in the Biomedicine/ Pedagogy domains ($P = 0.000$). A detailed description is reported in Table 1 and 2.

For the academic discipline of M-EDF/02 in the academic recruitment field of 06/N2, a significant difference was recorded in the Biomedicine/Pedagogy domains ($P = 0.000$) and in the Sport and Physical activity/

Table 1 One-way Anova for M-EDF-01 in 06/N2

	Sum of squares	df	Meansquare	F	Sig
Between groups	1131.081	2	565.541	101.926	0.000
Within groups	599.243	108	5.549		
Total	1730.324	110			

Table 2 Bonferroni Post Hoc test for M-EDF-01 in 06/N2

(I) Domain	(J) Domain	Mean Difference (I-J)	Std. Error	Sig.
Biomedicine	Sport and physical activity	6.08108*	0.54765	0.000
	Pedagogy	7.29730*	0.54765	0.000
Sport and physical activity	Biomedicine	-6.08108*	0.54765	0.000
	Pedagogy	1.21622	0.54765	0.085
Pedagogy	Biomedicine	-7.29730*	0.54765	0.000
	Sport and physical activity	-1.21622	0.54765	0.085

The mean difference is significant at the 0.05 level.

Table 3 One-way ANOVA for M-EDF-02 SSD in 06/N2

	Sum of squares	df	Mean square	F	Sig.
Between groups	403,471	2	201.736	26.904	0.000
Within groups	629,862	84	7.498		
Total	1033,333	86			

Table 4 Bonferroni post hoc test for M-EDF-02 in 06/N2

(I) Domain	(J) Domain	Mean difference (I-J)	Std. error	Sig.
Biomedicine	Sport and physical activity	1.68966	0.71912	0.063
	Pedagogy	5.17241*	0.71912	0.000
Sport and physical activity	Biomedicine	-1.68966	0.71912	0.063
	Pedagogy	3.48276*	0.71912	0.000
Pedagogy	Biomedicine	-5.17241*	0.71912	0.000
	Sport and physical activity	-3.48276*	0.71912	0.000

The mean difference is significant at the 0.05 level.

Table 5 One-way ANOVA for M-EDF-01 in 11/D2

	Sum of squares	df	Mean square	F	Sig.
Between groups	136.333	2	68.167	10.449	0.001
Within groups	137.000	21	6.524		
Total	273.333	23			

Table 6 Bonferroni post hoc test for M-EDF-01 in 11/D2

(I) Domain	(J) Domain	Mean Difference (I-J)	Std. Error	Sig.
Biomedicine	Sport and physical activity	-5.75000*	1.27709	0.001
	Pedagogy	-2.00000	1.27709	0.397
Sport and physical activity	Biomedicine	5.75000*	1.27709	0.001
	Pedagogy	3.75000*	1.27709	0.024
Pedagogy	Biomedicine	2.00000	1.27709	0.397
	Sport and physical activity	-3.75000*	1.27709	0.024

Pedagogy domains ($P=0.000$). A detailed description is reported in Table 3 and 4.

For the academic discipline of M-EDF-01 in the academic recruitment field of 11/D2, a significant difference was recorded in the Biomedicine/Sport and Physical activity domains ($P=0.001$) and in the Sport and

Physical activity/Pedagogy domains ($P=0.024$). A detailed description is reported in Tables 5 and 6.

For the academic discipline of M-EDF/02 in the academic recruitment field of 11/D2, a significant difference was recorded in the Biomedicine/Sport and Physical activity domains ($P=0.000$) and the Sport

Table 7 One-way ANOVA for M-EDF-02 in 11/D2

	Sum of squares	df	Mean square	F	Sig
Between groups	179.167	2	89.583	146.591	0.000
Within groups	5.500	9	0.611		
Total	184.667	11			

and Physical activity/Pedagogy domains ($P = 0.000$). A detailed description is reported in Tables 7 and 8.

Discussion

The aggregated data show a prevalence (1/3) of biomedicine scientific production over that of Sport and Physical activity, a modest Pedagogy production in 06/N2 and Biomedical in 11/D2, compared to high scientific production in the domain of Sport and Physical activity in 11/D2. The disaggregated data show that the academic discipline of M-EDF/01 in the academic recruitment field of 06/N2 had a significant difference versus Biomedicine and none between Sport and Physical activity and Pedagogy domains. It was also observed a significant difference between Biomedicine and Sport and Physical activity domains, with a prevalence of the latter. In contrast, there was no significant difference between Sport and Physical activity and Pedagogy domains, despite being Sport and Physical activity prevalence. As for the academic discipline of M-EDF/02 in the academic recruitment of 06/N2, it was not observed a significant difference between the Biomedicine and Sport and Physical activity domains, even if there was a biomedical prevalence. In contrast, there was a significant difference between Sport and Physical activity and Pedagogy domains, with a prevalence of the first domain.

On the other hand, in the academic discipline of M-EDF/01 in the academic recruitment field of 11/D2 and in the academic discipline of M-EDF/02 in the academic recruitment field of 11/D2 have been observed a significant difference between Biomedicine and Sport and Physical activity domains, with a prevalence of the latter. The same occurred between the two domains of Sport and Physical activity and Pedagogy, with a prevalence of the first domain. From these results, it was possible to appreciate an excess of publications relating to the biomedicine domain, a moderate level of publications relating to the Sport and Physical

activity domain, and a shortage of publications relating to the Pedagogy domain.

This study tried to identify methods, methodology, and epistemology adopted in the body of research carried out in the field of physical activity and sports sciences in the products of Italian scientific research. Since no previous studies have dealt with this specific topic in the field of sport sciences, no comparisons could be made. Beyond the original topic of this study, there is not a wide range of published research that has analysed research methods in Exercise and sports sciences. For example, one of the most common concerns the study of Freire et al. [15], aimed to identify methods, methodology and epistemology adopted in the body of research carried out on the building of values in physical education classes in schools during the decade 2000–2010. They asserted that more attention should be devoted to hermeneutic—phenomenological and critical—dialectical studies conducted in this area, investigating the beliefs and perspectives of the people studied and their actions in a school's real physical education environment.

Another similar research is that by Čustonja et al. [16], analysed the differences between and within the European and the USA departments, faculties or universities which offered a degree in human movement science studies according to their names. They recognised that we do not have one word accepted globally for the field of human movement studies. It is only a matter of academic and scientific consensus to accept kinesiology as a global and universal term for the science and profession in question. Finally, similar research conducted by Pang [17] delves into the socio-cultural perspectives of health and physical education and physical activity in the lives of ethnic minority students in Westernised countries. The reflections add to the current discourse on problematising health and physical education and physical activity research in general, particularly when researching the other.

Conclusion

The existence of the problem of the different coherence of the scientific profiles of the researchers concerning the relevant academic recruitment field and possibly also to the two academic disciplines was confirmed. The limitation of

Table 8 Bonferroni post hoc test for M-EDF-02 in 11/D2

(I) Domain	(J) Domain	Mean difference (I-J)	Std. error	Sig.
Biomedicine	Sport and physical activity	-7.50000*	0.55277	0.000
	Pedagogy	1.25000	0.55277	0.150
Sport and physical activity	Biomedicine	7.50000*	0.55277	0.000
	Pedagogy	8.75000*	0.55277	0.000
Pedagogy	Biomedicine	-1.25000	0.55277	0.150
	Sport and physical activity	-8.75000*	0.55277	0.000

this study is represented by the fact that the research survey was conducted considering only the titration of scientific products, thus not considering those articles that were not attributable to the domain of Sport and Physical Activity. In the second level of investigation, it will be necessary to consider these scientific articles, even though they do not have the corresponding title with the declaration of the two academic disciplines. They can be analysed by comparing the keywords of scientific products, which represent the second identifying level of the topic that the article deals with, with the official keywords of the CUN, which deal with the specific fields to complete the academic disciplines declarations. There is, therefore, a need to repeat the study with a more significant sample in terms of doubling the products to be analysed and increasing the number of professors involved.

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Declarations

Conflict of interest No conflict of interest with any person, company, or institution.

Ethical approval and informed consent Ethical approval and informed consent were waived for this study since this was an educational research study with a documentary approach. Therefore, the participation of experimental subjects was not planned.

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