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The BIOJ: a comparative review

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Abstract

Aim: **The aim of this descriptive study is to compare the types of articles published within the *BIOJ* with two other professional journals (*Physiotherapy* and *Ophthalmic and Physiological Optics* (*OPO*)).**
Methods: **Data were extracted using a standardised form, with two reviewers allocated to each journal. Each reviewer extracted data independently, and was blind to the other reviewer's comments. Articles were categorised into study type; author affiliation to an academic unit; and whether any author was based in the United Kingdom or Ireland. Details of the study population and ethics approval statements were abstracted.**
Results: **It was hypothesised that *Physiotherapy* and *OPO* would contain more articles of a 'higher' level of evidence when compared to the *BIOJ*. This was not found. Although the *BIOJ* did not publish any Category A studies, the number of articles in the other study classification categories were similar. Over a third of articles published in *BIOJ* were narrative reviews, and the number of Category D studies published in the *BIOJ* appears to be increasing over time. However the number of articles per year is low and the figures must be interpreted with caution.**
Conclusions: **The content of the *BIOJ* does appear unbalanced, with a high number of review articles and case reports. Over the 5-year period investigated, these account for over 50% of the content of the *BIOJ*. It is hoped that this article will be a prompt for discussions on how research and dissemination can be achieved; and on the future and profile of the *BIOJ* itself.**

Key words: BIOJ, Comparative, Dissemination, Medline, Optometry, Physiotherapy, Study design

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Introduction

The demand for evidence based medicine (EBM) has led to a wealth of information available for both clinicians and patients alike. Online resources, websites, clinical journals, professional journals, patient forums, and even social media (such as Twitter or Facebook) are just some of the ways in which information can be accessed. With such an explosion of communication, it may be difficult for individuals to choose which information to refer to. The number of academic journals has been increasing at a rate of over 3% each year.[1] In early 2009, there were over 25,000 active scholarly peer-reviewed journals.[2] Most healthcare professionals have a professional journal, and this is often the first, readily accessible source of information available. Access to the professional journal is frequently through a hardcopy issued as part of subscription fees. However, some journals are also available to others via online access.

Not only has the number of journals available increased, but the way in which articles convey their message has also changed. A number of initiatives have been introduced to improve the standard of reporting for different types of studies. This was in part due to the CONSORT group; a group of experts who developed a new scale to assess the quality of randomised controlled trials reports. The CONSORT statement is an evolving instrument,[3] which has been endorsed by many reputable journals including *The Lancet*, *BMJ* and *New England Journal of Medicine*. The CONSORT statement has been a driving factor in the development of other initiatives to improve the reporting of other types of research. These include: Strengthening the Reporting of Observational Studies in Epidemiology (STROBE),[4] Standards for the Reporting of Diagnostic Accuracy Studies (STARD),[5] Strengthening the Reporting of Genetic Association studies (STREGA),[6] Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA),[7] and Standards for Quality Improvement Reporting Excellence (SQUIRE).[8] These reporting guidelines have been incorporated into the EQUATOR Network initiative to enhance the transparent and accurate reporting of research studies.[9] However, whilst standards have been introduced, they haven't always been adopted by professional journals in their recommendations to authors.

Table 1. Summary of classification of articles for *BIOJ*, *OPO* and *Physiotherapy* journals

		BIOJ					*OPO*					*Physiotherapy*				
Year		2007	2008	2009	2010	2011	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Category A studies	RCT	–	–	–	–	–	–	1	1	–	2	–	2	4	3	4
	Randomised crossover trial	–	–	–	–	–	3	2	1	–	1	–	1	–	1	1
	Total (%)	*0*					*11 (2.9)*					*16 (7.7)*				
Category B studies	Prospective cohort study	–	1	–	1	–	4	2	–	–	–	–	–	–	2	–
	Retrospective cohort study	–	–	–	1	–	2	–	–	–	–	–	–	1	–	–
	Total (%)	*3 (4.2)*					*8 (2.1)*					*3 (1.4)*				
Category C studies	Non-RCT	–	–	–	–	–	–	1	–	1	3	–	1	–	1	1
	Non-randomised crossover trial	–	1	1	–	–	–	–	4	–	3	1	–	1	–	–
	Case–control study	–	–	–	–	–	–	–	–	2	1	–	–	–	–	–
	Time series study	–	–	–	–	–	–	–	2	1	1	–	3	–	–	1
	Diagnostic, validity, or reliability study	2	3	–	1	–	8	12	14	8	5	4	4	6	3	5
	Total (%)	*8 (11.1)*					*66 (17.5)*					*31 (15.0)*				
Category D studies	Non-controlled trial	–	–	2	3	1	2	4	6	7	3	3	2	1	1	4
	Case study	2	–	2	2	4	1	3	–	–	–	–	1	1	–	2
	Case series	1	–	–	–	1	1	1	–	–	1	1	–	–	–	–
	Other descriptive study	–	1	–	3	2	5	9	20	36	17	11	12	8	12	11
	Cross-sectional study	4	–	2	2	4	36	20	19	31	18	5	6	7	10	9
	Trend study	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–
	Before–after study	–	–	–	–	–	1	1	2	1	–	–	2	1	–	1
	Total (%)	*36 (50.0)*					*246 (65.1)*					*112 (54.1)*				
'Other' category	Meta-analysis or systematic review	–	–	–	–	–	1	–	1	–	1	4	4	5	5	3
	Narrative review (review article)	8	5	7	3	2	2	6	1	6	8	5	2	1	–	3
	Other (describe)	–	–	–	–	–	8	4	3	4	2	1	1	4	2	5
	Total (%)	*25 (34.7)*					*47 (12.4)*					*45 (21.7)*				
	Total	17	11	14	16	14	74	66	74	98	66	36	41	40	40	50
	Total	**72 (100)**					**378 (100)**					**207 (100)**				

The *British and Irish Orthoptic Journal* (*BIOJ*) (formerly the *British Orthoptic Journal*) was first published in 1939. The journal is the official publication of the British and Irish Orthoptic Society (BIOS). The journal publishes papers on clinical subjects relating to ocular motility, visual assessment and visual pathology. To date, the *BIOJ* has not been accepted for Medline indexing (the most popular and internationally recognised online search engine for medical journals). *Physiotherapy* is the official publication of the Chartered Society of Physiotherapy. Its stated aims are 'to publish original research and facilitate continuing professional development for physiotherapists and other health professions worldwide. It is dedicated to the advancement of physiotherapy through publication of research and scholarly work concerned with, but not limited to, its scientific basis and clinical application, education of practitioners, management of services and policy'.[10] In 2009, the editorial board of *Physiotherapy* announced their Medline status marking the culmination of many years of work by successive editors and editorial boards.[11] Four issues of *Physiotherapy* are published per year, and are available in both hardcopy and as an online resource. *Ophthalmic and Physiological Optics* (*OPO*) is the official journal of the Association of Optometrists, and was first published in 1925. It describes itself as 'a leading international interdisciplinary journal that addresses basic and applied questions pertinent to contemporary research in vision science and optometry. *OPO* publishes original research papers, technical notes, reviews and letters and will interest researchers, educators and clinicians concerned with the development, use and restoration of vision'.[12] Six issues of *OPO* are published per year, and are available in both hardcopy and as an online resource. *OPO* received Medline status in 1982.

The aim of this study is to compare the types of articles published within the *BIOJ* with two other professional journals (*Physiotherapy* and *OPO*). Additional objectives are to explore any trends in the types of studies published over a five-year period; and to examine the reporting standards between journals. As *Physiotherapy* and *OPO* are both Medline indexed, it is hypothesised that these journals will contain more articles of a 'higher' level of evidence when compared to the *BIOJ.* This hypothesis will be explored in this study.

Methods

Data were extracted from three peer-reviewed academic journals (*BIOJ*, *Physiotherapy* and *OPO*), for all volumes and issues from 2007 to 2011 (inclusive). Data were extracted using a piloted standardised form (Appendix A). Data extraction was undertaken, with two reviewers allocated to each journal. Each reviewer extracted data independently, and was blind to the other reviewer's comments. Any disagreement was resolved following discussion with a third reviewer.

Articles were initially categorised into studies using a classification adopted from the Academy of Nutrition and Dietetics Evidence Analysis Manual.[13] A copy of the classification system is shown in Appendix B. Articles were categorised as to whether any of the authors were affiliated with an academic unit; and whether any author was based in the United Kingdom (UK) or Ireland. Details of the articles' study population were abstracted; and data were also extracted regarding statements of ethics approval. Articles were assessed as to whether there was a statement regarding ethics approval within the article, and if so if this was obtained from either a National Research Ethics Committee, or

institutional research committee (i.e. University). A 'not applicable' category was also used for studies such as review articles, case reports or case series. Data were synthesised using a hierarchical classification of studies as shown in Appendix B.[13] All statistical analysis was undertaken using Microsoft Office Excel 2007.

Results

Table 1 shows a summary of the number of articles within each classification for the *BIOJ*, *OPO* and *Physiotherapy* journals between 2007 and 2011. The *BIOJ* did not publish any Category A studies during this time period. Another notable difference is the number of 'Other Category' articles published within the *BIOJ*; this is greater than both *OPO* and *Physiotherapy*, and is comprised of narrative reviews. Fig. 1 shows that the vast majority of articles published within the *BIOJ* are from one (or more) author(s) based in the UK or Ireland. *OPO* has the greatest number of articles written by authors from outside of the UK or Ireland. Fig. 2 shows the number of articles where one (or more) author(s) were associated with an academic unit (i.e. university department). It was not always clear as to what the affiliation of some authors was; these were categorised as 'don't know'. Over 90% of articles published in *OPO* were written by one (or more) author(s) working at a university department. This was much lower for *BIOJ* publications. Fig. 3 shows the study population used in the articles published in the respective journals.

Table 2 shows the number of articles where a clear statement regarding ethics approval was given for each journal. It must be acknowledged that not all submissions require ethics approval, and these articles were categorised as 'not applicable'. Very few articles published in *Physiotherapy* failed to provide an indication that formal ethics approval had been given; this is in contrast to *BIOJ* and *OPO*. Table 3 shows the number of 'review' articles within each journal. It can be seen that over a third of articles published in *BIOJ* were narrative reviews. Tables 4–6 show the trends of study classification category over time for the respective journals. The number of Category D studies published in the *BIOJ* appears to be increasing over time; however the number of articles per year is low and the figures must be interpreted with caution. Table 7 shows the number of articles published in *Physiotherapy* over the five-year period where one (or more) author(s) were from UK or Ireland. *Physiotherapy* was Medline indexed in 2009. The results could be interpreted as that following Medline indexing, the international profile of *Physiotherapy* increased, thereby encouraging a greater number of submissions from outside UK and Ireland.

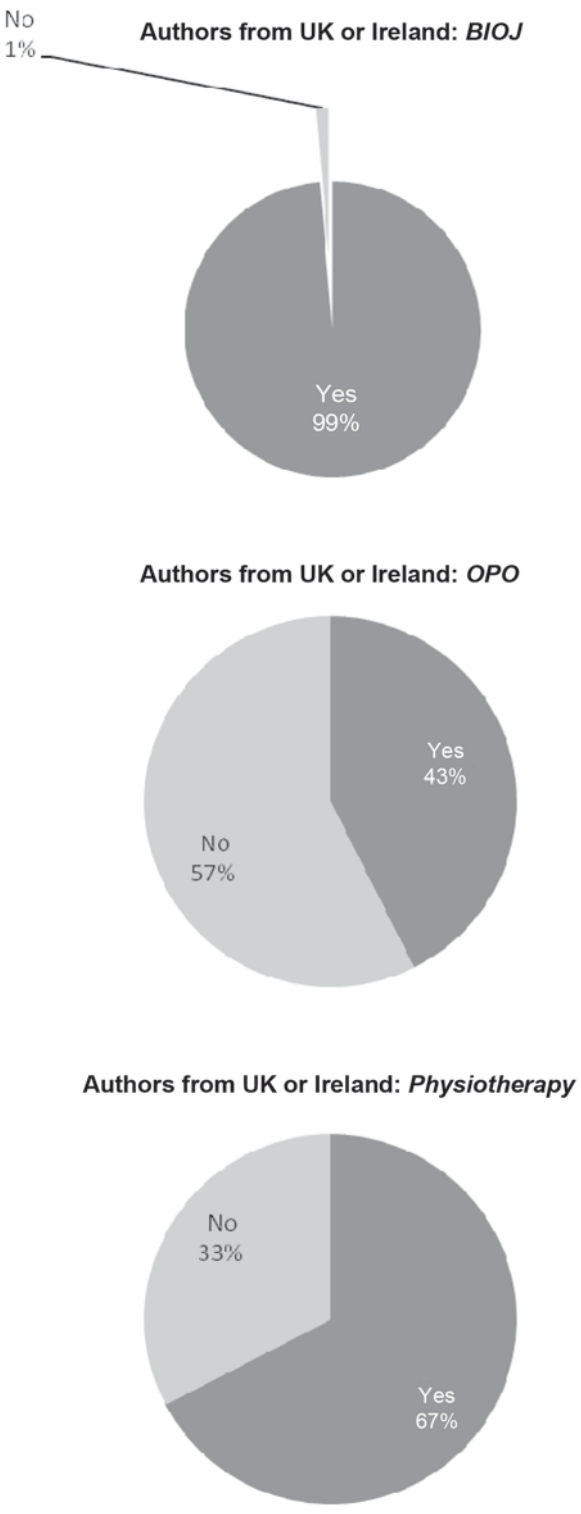
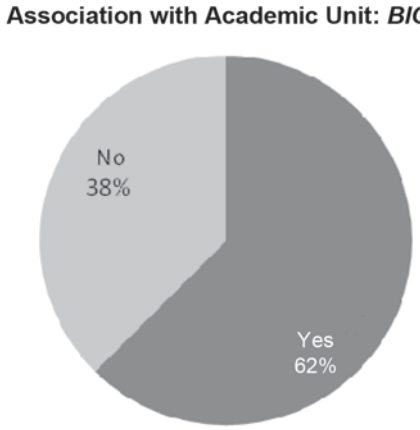
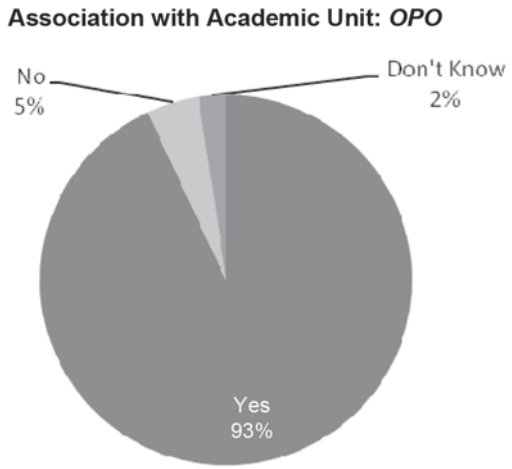


Fig. 1. Authors from UK or Ireland for *BIOJ*, *OPO* and *Physiotherapy* journals.

Discussion

The journals selected for this study were chosen in an attempt to compare orthoptists with similar level professions, with a similar academic background. The journals have a number of similarities, and notable differences. Each of the journals operates a peer-review policy, with manuscripts sent to a minimum of two reviewers. A system of blind, anonymous peer-reviewing occurs with *Physiotherapy* and *OPO*. *BIOJ* also has a peer-review process, where manuscripts are sent to two reviewers. At present this process is not fully anonymised. The format and layout of the *Physiotherapy* journal is standardised, for both abstracts and manuscripts. Manuscripts stated what type of study they were describing in the abstract, including details on the setting





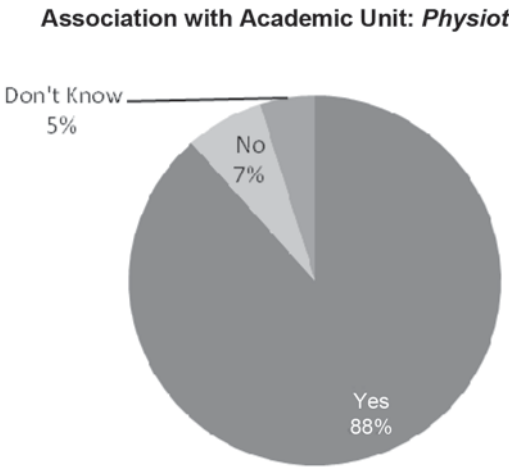
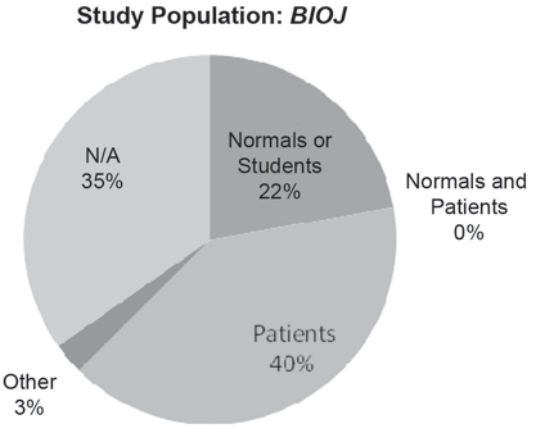
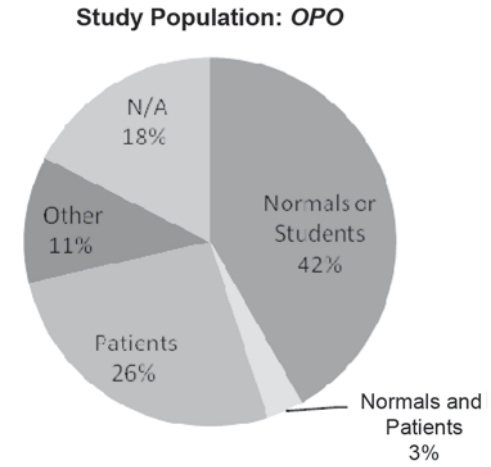


Fig. 2. Association with an academic unit for *BIOJ*, *OPO* and *Physiotherapy* journals.





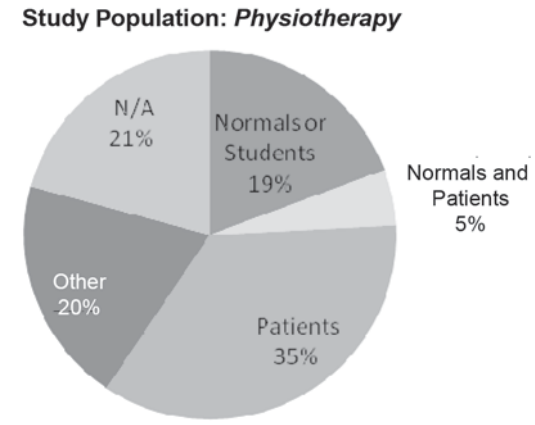


Fig. 3. Study population for *BIOJ*, *OPO* and *Physiotherapy* journals.

and population studied. OPO had a less structured format, and was not as clear in conveying these messages to the reader.

It must be acknowledged that the number of orthoptists and the number of physiotherapists and optometrists differs widely. To that end, the number of articles submitted and published by the respective journals is likely to differ. Both the *Physiotherapy* and *OPO* journals have multiple issues in a year, which is not achievable for the *BIOJ*. Furthermore, as *Physiotherapy* and *OPO* are also available online, they have an international profile and can reach a wider audience than just their UK members, with the consequence of more papers being published from outside the UK and Ireland.

The declaration of ethics approval and consent varied

Table 2. Number of articles reporting formal ethics approval for *BIOJ*, *OPO* and *Physiotherapy* journals

	Ethics 'Yes' *n* (%)	Ethics 'No' *n* (%)	Ethics 'N/A' *n* (%)	Total *n* (%)
BIOJ	19 (26.4)	13 (18.1)	40 (55.6)	72 (100)
OPO	182 (48.1)	79 (20.9)	117 (31.0)	378 (100)
Physiotherapy	143 (69.1)	4 (1.9)	60 (29.0)	207 (100)

Table 3. Number of 'review' articles for *BIOJ*, *OPO* and *Physiotherapy* journals

	Systematic review or meta-analysis *n* (%)	Narrative review *n* (%)	Total no. of articles *n* (%)
BIOJ	0	25 (34.7)	72 (100)
OPO	3 (0.8)	23 (6.1)	378 (100)
Physiotherapy	21 (10.1)	11 (5.3)	207 (100)

Table 4. Classification of articles over time: *BIOJ*

Category	2007	2008	2009	2010	2011
A	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
B	0 (0)	1 (9.1)	0 (0)	2 (12.5)	0 (0)
C	2 (11.8)	4 (36.4)	1 (7.1)	1 (6.3)	0 (0)
D	7 (41.2)	1 (9.1)	6 (42.9)	10 (62.5)	12 (85.7)
Other	8 (47.1)	5 (45.5)	7 (50.0)	3 (18.8)	2 (14.3)
Total	**17 (100)**	**11 (100)**	**14 (100)**	**16 (100)**	**14 (100)**

Values are *n* (%).

Table 5. Classification of articles over time: *OPO*

Category	2007	2008	2009	2010	2011
A	3 (4.1)	3 (4.5)	2 (2.7)	0 (0)	3 (4.5)
B	6 (8.1)	2 (3.0)	0 (0)	0 (0)	0 (0)
C	8 (10.8)	13 (19.7)	20 (27.0)	12 (12.2)	13 (19.7)
D	46 (62.2)	38 (57.6)	47 (63.5)	76 (77.6)	39 (59.1)
Other	11 (14.9)	10 (15.2)	5 (6.8)	10 (10.2)	11 (16.7)
Total	**74 (100)**	**66 (100)**	**74 (100)**	**98 (100)**	**66 (100)**

Values are *n* (%).

Table 6. Classification of articles over time: *Physiotherapy*

Category	2007	2008	2009[a]	2010	2011
A	0 (0)	3 (7.3)	4 (10.0)	4 (10.0)	5 (10.0)
B	0 (0)	0 (0)	1 (2.5)	2 (5.0)	0 (0)
C	5 (13.9)	8 (19.5)	7 (17.5)	4 (10.0)	7 (14.0)
D	21 (58.3)	23 (56.1)	18 (45.0)	23 (57.5)	27 (54.0)
Other	10 (27.8)	7 (17.1)	10 (25.0)	7 (17.5)	11 (22.0)
Total	**36 (100)**	**41 (100)**	**40 (100)**	**40 (100)**	**50 (100)**

Values are *n* (%).
[a]Achieved Medline status.

Table 7. Number of articles in *Physiotherapy* where one or more author(s) were from the UK or Ireland

	2007	2008	2009[a]	2010	2011
Total no. of articles	36	41	40	40	50
No. of articles where one or more author(s) were from the UK or Ireland (%)	24 (66.7)	32 (78.0)	30 (75.0)	20 (50)	21 (42.0)

[a]Achieved Medline status.

widely between journals. Physiotherapy had a designated section at the end of the manuscript where details of the review body and application number were disclosed. There was also a statement in this section when ethics approval had not been sought or was not applicable. Some articles from each of the journals made statements such as 'informed consent was obtained' or 'all research was conducted in accordance with the declarations of Helsinki'. It could be argued that these are insufficient in modern times. Research, whether it is conducted on patients or 'normals', should be subject to scrutiny and review before it is commenced; this is to ensure that the research will be carried out in an appropriate manner, and that the study is robust. Details of the review process ought to be declared. It can be seen from Table 2 that 18% of articles in the *BIOJ* did not state whether ethics approval had been sought.

Previous editors of the *BIOJ* have spent much time and effort in trying to achieve Medline status. In 2009, the National Library of Medicine concluded that the index rating of the journal was not high enough for the journal to be indexed. There could be a number of reasons for this, including the content of the journal; and/or the standard of writing and reporting within the journal itself. Based upon the results described here, it is difficult to ascertain why this may be the case. The *BIOJ* does appear comparable in the types of articles it publishes, with the exception of the 'Category A' type studies (trials) and 'Other' studies, but narrative reviews do form a large amount of the content of the *BIOJ*.

There are a number of factors that must be acknowledged when considering some of the results found. The association with an academic unit is one of those, and the results can be interpreted in a number of ways. Fig. 2 shows that the percentage of articles written by one or more authors associated with an academic unit is lowest in *BIOJ*. This was surprising to the authors, particularly if we consider the content of some recent editions where a number of the publications are based upon orthoptic undergraduate projects. However, this may also be a reflection on the type of papers within the journal. *OPO* contains many theoretical and mathematical projects or discussion papers, all of which are written by academics. This may be supported by the study population, and as can be seen in Fig. 3 the majority of studies in *OPO* use 'normals' or students in their methodology. Studies are reporting normative values, validating different diagnostic methods or instruments, and so on.

Conducting research within the NHS, or the healthcare system in Ireland, is not easy. The process of ethics approval can be a daunting and time-consuming prospect. Local Trust and Research and Governance requirements can be just as difficult. Many research departments now requirement payment for registering projects, and their assistance in obtaining ethics approval and support services. This in itself can be a barrier to research, particularly when departments are being encouraged to make efficiency savings. Another important consideration is that of time. Very few clinical orthoptic departments have protected research time, and there are and will continue to be demands to increase clinical capacity with fewer resources. Any form of research requires commitment; from conceiving the idea

and preliminary reading, through to execution and dissemination. It is often a considerable commitment for the individual and the department which, in the current climate, is often difficult to achieve.

Dissemination of findings is important; it is unethical to carry out research on individuals unless one intends to declare one's findings. The *BIOJ* provides an important and accessible forum for dissemination, yet it is likely that research is being carried out within departments that is not being disseminated. One reason may be the concern over writing the article itself. Many Trusts and Universities offer short-courses on how to write for publication and the BIOS has a well-developed research mentoring scheme to support new researchers. However, we must also recognise that the *BIOJ* is often not the first choice of journal when it comes to article submissions. As *BIOJ* is not listed on Medline, it does not have the same level of dissemination and profile as other orthoptic and ophthalmology journals. Authors may have personal or professional pressures to submit to journals of a higher rank and impact. It is difficult to know how to address this issue.

The way forward?

Orthoptics in the UK and Ireland is highly regarded, and the presence of such a strong contingent at the recent IOC congress in Toronto is a reflection of that.[14] The work that was discussed at the conference was of notable standard, and it was apparent that UK and Irish orthoptists were highly regarded. But we must acknowledge that there is a risk that the *BIOJ* may fall behind in comparison with its contemporaries. Some would argue that Medline status should be aimed for, and on achieving it the international profile of the *BIOJ* will be further improved, increasing the number of international submissions. As seen in Fig. 1, only 1.4% of submissions were not based in the UK and Ireland.

In order to achieve Medline status, a number of objectives will have to be met. One of these is to encourage a greater number of original articles. As shown in Table 3, over a third of articles printed in the *BIOJ* are narrative reviews. Narrative and systematic reviews are not the same; however both are important. They provide a summary of literature to a research question. Systematic reviews do this in a structured and open way. The strategies employed in identifying the literature, extracting data and summarising data are clearly described. Most journals now advocate a PRISMA flow diagram of study identification as a minimum. Narrative reviews do not detail how literature was identified, and there is often no critique made on the studies described. The reader is left having to make a judgement as to why a study has been included. Some would argue that a narrative review is subject to author bias in a way that systematic reviews are not. So whilst secondary studies (like review articles) are of importance, the ways in which they are conducted and reported do differ, and systematic reviews are judged to be of a higher evidence standard than narrative reviews. The number of narrative reviews published in the *BIOJ* is high.

The type of articles published is only one area to address; another would be to increase submissions of primary research. By having greater competition, standards will improve, and reviewers and editors will be required to make more of a judgement on whether an article should be published. Over recent years editors of the *BIOJ* have had to ask individuals for submissions in order to achieve sufficient content for a journal to be produced. It is a chicken and egg scenario – people don't submit to the *BIOJ* as it is not Medline linked, but it won't achieve that until more primary research is published within it.

The profile of the journal itself may also need to be addressed. At present the *BIOJ* is primarily only available in hardcopy to orthoptists who have paid their society subscription fees. Non-members can obtain the journal for a fee via the BIOS website. But if we want our research to be accessible to others, is this appropriate? If the *BIOJ* was available to others as an online resource, then other professionals would be able to access and reference our research, raising the research profile of UK and Irish orthoptists. Furthermore, there are no search facilities (such as 'key words' or 'author'), so finding information from within our own professional journal is not possible. This may also be a contributing factor as to why the *BIOJ* is not the first choice of journal for article submissions. The 'Research Excellence Framework (REF) is the new system for assessing the quality of research in UK higher education institutions (HEIs). It will replace the Research Assessment Exercise (RAE) and will be completed in 2014'.[15] One of the criteria that will be considered in the REF exercise will be that of citations, the number of times an article is cited by others. A number of factors can contribute to a high citation figure, such as the development of a new theory or test, or a seminal piece of research. High citation figures tend to be in highly ranked journals, as these are the most frequently accessed. They are frequently accessed as they are mainly Medline indexed, and searchable on the internet. The *BIOJ* is neither of these.

Conclusion

The purpose of this study was to examine the content of the *BIOJ* and to compare this with two other professional journals. It was hypothesised that as *Physiotherapy* and *OPO* are Medline indexed, that these journals would contain more articles of a 'higher' level of evidence when compared to the *BIOJ*. This was not the case. It is encouraging to see that it is comparable to its counterparts, particularly in light of the size of the profession. However, the content of the journal does appear unbalanced, with a high number of review articles and case reports. Over the five year period investigated, these account for over 50% of the content of *BIOJ*. Such articles are of importance, and much information can be obtained from them, but their number is disproportionate when compared to *Physiotherapy* and *OPO*. Whilst there are notable barriers to conducting and publishing research within the NHS, and the healthcare system in Ireland, as a profession we must take stock of what we have, and where we want to be. The work of previous editors of the *BIOJ* should not be underestimated. Much

Appendix A. Data extraction form

Journal title					
Volume; Issue					
Year					
Authors					
Ethics approval (tick)	Yes	No	N/A		
Authors from UK or Ireland (tick)	Yes	No			
Authors associated with academic unit (tick)	Yes	No	Don't Know		
Study population (tick)	Normals or Students	Normals and patients	Patients	Other	N/A
Type of study (tick)	Category A studies	Randomised controlled trial (RCT)			
		Cluster randomised trial			
		Randomised crossover trial			
	Category B studies	Prospective cohort study			
		Retrospective cohort study			
	Category C studies	Non-randomised controlled trial			
		Non-randomised crossover trial			
		Case–control study			
		Time series study			
		Diagnostic, validity or reliability study			
	Category D studies	Non-controlled trial			
		Case series			
		Case study			
		Other descriptive study			
		Cross-sectional study			
		Trend study			
		Before–after study			
	Other category	Meta-analysis or systematic review			
		Narrative (review article)			
		Decision-analysis			
		Cost–benefit analysis			
		Cost-effectiveness study			

effort has gone and continues to go into the review process. Furthermore, efforts to obtain Medline indexing were lengthy and hard fought. If the *BIOJ* is to be considered for Medline status, then collectively we all must contribute in order to achieve that aim. It is hoped that this article will be a prompt for discussions on how research and subsequent publication can be achieved at a local level. It is also hoped that the future and profile of the *BIOJ* is taken into consideration. Plans and developments for the journal should be strategised. Considerations may include themed issues, online access, or an audit section. The quality of a professional journal should match the status of the profession. The standard of UK and Irish orthoptists is high; perhaps we could and should do more to improve the quality and dissemination of our research.

The authors declare they have no competing interests.

Appendix B. Categorical classification of studies

Category	Study
A	Randomised controlled trial (RCT)
	Cluster randomised trial
	Randomised crossover trial
B	Prospective cohort study
	Retrospective cohort study
C	Non-randomised controlled trial
	Non-randomised crossover trial
	Case–control study
	Time series study
	Diagnostic, validity or reliability study
D	Non-controlled trial
	Case study or case series
	Other descriptive study
	Cross-sectional study
	Trend study
	Before–after study
Other	Meta-analysis or systematic review
	Narrative review
	Decision analysis
	Cost-benefit analysis
	Cost-effectiveness study

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