



Seasonality of medical student research: Does a pattern truly exist?

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ABSTRACT

Seasonal variation to manuscript submission and publication in the medical literature is yet to be carefully scrutinized. We report a lack of significant seasonal bias in relation to medical student submission to a prominent Australasian medical journal. Factors that contribute to when a manuscript is submitted may be predictable. Factors that contribute to when a manuscript is published, on the other hand, appear to be less predictable. These observations remain preliminary as the studies examining seasonal bias in the medical literature are too few and methodologically heterogeneous. A careful consideration of the implications will need to be taken into account to ensure a fair peer-review process.

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Introduction

Seasonal bias refers to the temporal variation in the rates, at which the manuscripts are submitted and/or published in scientific journals. Since the date of submission may correlate weakly with the date when the research had been finalized, the date of publication is less likely to bear any significance as to when the research was conducted (i.e., as there are several more factors at play).

Almost all of the data on the seasonal variation of scholarly activity come from physics and social science literature [1,2]. If such seasonal variation truly exists, it has been debatable. While some journals were found to exhibit such variation [1,3], others were not [1,4,5].

Data pertaining to seasonality in the medical literature remain relatively scarce as only two studies were found to address the issue. For submission seasonality, a review of the number of manuscripts submitted collectively to 20 dermatology journals found that May was the least popular month for submission, whereas July was the most popular [6]. *Publication* seasonality, on the other hand, was reported by Al-Busaidi et al. [7], who found that student-authored articles were published more commonly in the June and November issues of the New Zealand Medical Journal (NZMJ) compared with other issues.

Understanding how peer-review processes differ (if any) for student–authors, is important in order to uncover any biases (whether covert or overt). Aiming to remove any obstacles that could potentially face student–authors is a worthwhile endeavor. The first step, however, would be to prove if bias exists. This would fill a current gap in our knowledge.

As part of an ongoing trial, we reviewed all articles submitted to and published in the Medical Journal of Australia (MJA) over a 14-year period. The aim of the present study was to examine if a seasonality pattern exists in student submissions in the MJA, and if present, how it relates to patterns described in the medical literature.

Methods

All articles published in the MJA between January 2001 (issue 1, volume 174) and December 2014 (issue 11, volume 201) were reviewed electronically. This time frame was intentionally selected as the MJA published accurate author information (including then positions and careers) during this period. Articles for which no submission/publication date was stated and those which were authored anonymously were excluded. The included publications were those whose one or more authors (regardless of order) were stated as students in the author information.

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Table 1. A breakdown of the type of student-authored articles in the Medical Journal of Australia.

Article type	Count
Addressing diseases of disadvantage	1
Bites and stings	3
Case report	8
Christmas offerings	4
Clinical update	3
Colorectal cancer	1
Communication, culture and health	1
Conference report	5
Correction	1
Crisis	1
Defining the gap	1
Diabetes	1
Diagnostic dilemma	1
Doctors in training	2
Editorial	10
Enduring sport	1
Ethics and law	6
For debate	7
Health care	3
Health care reform	1
History	1
Improving clinical care	1
Indigenous health	3
Lessons from practice	3
Letter	108
Medical education	2
Medicine and the community	2
Medicine and the law	1
Medicine and the media	2
Notable cases	4
Original	100
Other	5
Pandemic (H1N1)	1
Pandemic influenza	1
Perspective	31
Poverty and human development	1
Protecting the planet	1
Public health	1
Reflections	19
Refugee health	4
Research enterprise	2
Review	6
Snapshot	1
Students abroad	1

Article type	Count
Supplement	6
Systematic review	1
The research enterprise	1
The whole wide world	1
Viewpoint	6
Total	377

To determine if the academic year timing had any influence on submission dates, the month and year of article submission were reviewed. Locally accepted definitions of the academic year [8] were utilized to categorize publications (first semester, March–June; second semester, August–November; and study breaks, July and December–February).

The descriptive statistics and two-tailed Chi-squared test (χ^2) were used to analyze the data. Statistical significance was determined if type I error rate was <5% (p -value < 0.05). All analyses were performed using SPSS Statistics® software package (version 22.0.0.0).

Results

Articles retrieved

A total of 377 articles were published by students in the MJA during the study period; 168 articles (44.6%) included submission and acceptance dates. The details of student–authorship have been described elsewhere [9]. The median lag between article submission and publication was 210 days (range, 47–696). Overall, the most common types of articles published by students were original research (29.2%) and letters (28.9%). A breakdown of the type of student-authored articles is shown in Table 1.

Submission seasonality

The median lag between article submission and acceptance was 125.5 days (range: 2–515). The number of student-authored submissions was the most in September ($n = 22$) and fewest in December ($n = 7$).

A seasonality pattern pertaining to when students submit their work in relation to the academic year was not observed. The student-authored articles were not more likely to be submitted during the second academic semester ($n = 62$) or study breaks ($n = 47$) than in the first semester ($n = 59$) of the academic calendar ($\chi^2 = 2.25$, $p = 0.32$).

Continued

Discussion

We found that the number of student-authored submissions to the MJA was the most in September ($n = 22$) and fewest in December ($n = 7$). However, a seasonality pattern of student submissions in relation to the academic year was not detected. To the best of the AUTHORS' knowledge, this is the first attempt to examine the role of seasonal variation in the medical literature.

Multiple factors dictate when a submission is made by the authors and published by the journal [10]. Factors that contribute to when a manuscript is *submitted* could include the structure of the academic year, availability of prospective employment opportunities (e.g., desire to publish to increase "competitiveness" prior to a national job application), and grant deadlines [11]. Taken together, these factors can conceivably result in seasonal or quasi-seasonal surges in the number of submissions to a journal.

Factors that contribute to when a manuscript is *published*, on the other hand, are supposedly less predictable. The duration of time that a manuscript takes to be handled by the editors and reviewed by peer-reviewers varies significantly [12]. Editors and, especially, reviewers often have other time-sensitive commitments; having such a "seasonal burdens" of manuscripts to review may result in further delays [6,13]. If the journal decides that the manuscript needs revision, then commitments of other co-authors (e.g., for draft revisions) become an important consideration in the delay. Even after a manuscript is accepted for publication,

the article may be *in press* until such time that an issue of the journal is deemed as a good fit for the article's final publication. Besides, open-access/electronic journals are able to accommodate more articles with less rigid timelines than traditional journals [14] which may potentially further obscure any seasonality to the publication of an article.

The findings by Al-Busaidi et al. [7] of student articles being published significantly more frequently in the June and November issues of the NZMJ remain perplexing. It is difficult to attribute monthly variation of publications to the structure of the academic year as the date of research cannot reliably be inferred from the date of publication. Figure 1 shows the number of student publications by month in the MJA (present study) and NZMJ [7].

This type of study is not without its limitations. Reviewing student contribution to one journal is unlikely to be representative but does provide some reassurances to the fact that no seasonal bias was found. Besides, looking at articles *published* does not necessarily reflect the volume of articles actually *submitted*. Finally, how the student's position and/or being the corresponding author alters the findings which were not assessed in the current study.

Seasonal variation in publications from other fields (e.g., physics) has previously raised concerns about the fairness of the peer-review process. It is encouraging, therefore, that there was a lack of variation in our study. However, our observations remain preliminary as the studies examining seasonal bias in the medical literature are too few and not clearly representative. Careful consideration of

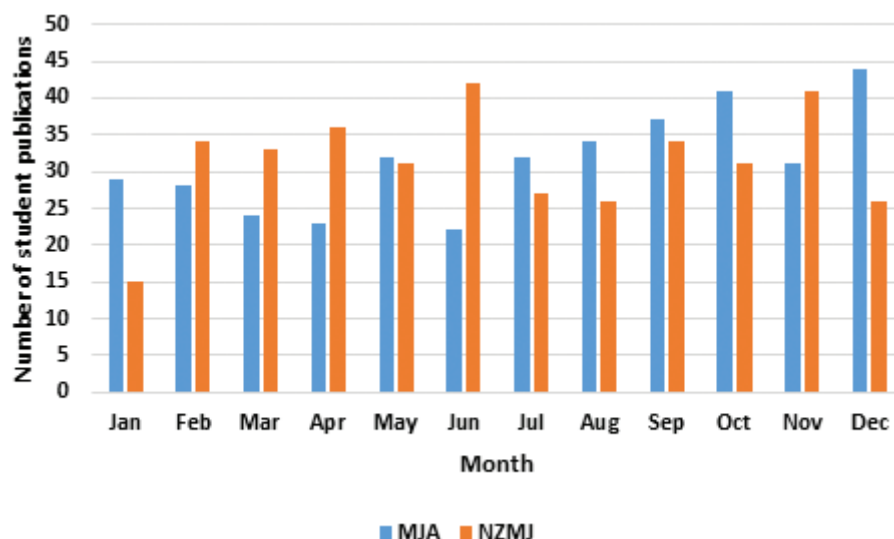


Figure 1. Number of student articles by the month of publication in the Medical Journal of Australia ($n = 377$) and New Zealand Medical Journal ($n = 376$).

the implications, including even distribution of submitted manuscript to reviewers [6] and unbiased acceptance or rejection of manuscripts regardless of time pressures, will need to be taken into account to ensure a fair peer-review process.

Conflict of interest

The authors report no conflict of interest.

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