Introduction

The National Academies of Sciences, Engineering, and Medicine recently emphasized the importance of collecting sex and gender data in research, and avoiding conflation of these variables. Sex is defined as a biological attribute encompassing chromosomes and reproductive anatomy; gender refers to sociocultural roles and behaviors associated with one's perception of themselves, including psychological, emotional, and behavioral identity. For accurate, equitable, and inclusive biomedical research, researchers must understand and distinguish between sex and gender to ensure the intended demographic is studied and reported, as these intricately linked variables uniquely influence health and disease. We evaluated prominent journals' sex and gender reporting guidelines.

Methods

Ethics committee approval was not required as all data are publicly available. Cross-sectional analysis adhering to the STROBE guidelines of the 20 journals with the highest 2020 impact factor.

Table 1. Characteristics of Analyzed Medical Specialties and Associated Journals

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Total active physicians 2019</th>
<th>Total EIC positions</th>
<th>Total women EIC, No. (%)</th>
<th>Mean (SD)</th>
<th>2020 IF</th>
<th>Journal age, y</th>
</tr>
</thead>
<tbody>
<tr>
<td>General medicine/internal medicine</td>
<td>120,171</td>
<td>21</td>
<td>8 (38.1)</td>
<td>24.8 (25.6)</td>
<td>86.2 (72.0)</td>
<td>50.5 (46.1)</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>60,618</td>
<td>22</td>
<td>5 (22.7)</td>
<td>5.7 (3.2)</td>
<td>48.8 (30.7)</td>
<td>52.2 (41.2)</td>
</tr>
<tr>
<td>Emergency medicine</td>
<td>45,202</td>
<td>22</td>
<td>1 (4.5)</td>
<td>3.2 (1.2)</td>
<td>30.5 (13.4)</td>
<td>46.6 (41.8)</td>
</tr>
<tr>
<td>Obstetrics and gynecology</td>
<td>42,720</td>
<td>22</td>
<td>4 (18.2)</td>
<td>5.7 (2.8)</td>
<td>51.9 (35.7)</td>
<td>42.2 (46.2)</td>
</tr>
<tr>
<td>Anesthesiology</td>
<td>42,267</td>
<td>21</td>
<td>0 (0)</td>
<td>5.0 (2.1)</td>
<td>49.2 (29.8)</td>
<td>37.9 (12.3)</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>38,792</td>
<td>21</td>
<td>3 (14.3)</td>
<td>13.4 (10.2)</td>
<td>53.3 (47.5)</td>
<td>28.0 (11.3)</td>
</tr>
<tr>
<td>Radiology</td>
<td>28,025</td>
<td>27</td>
<td>5 (18.5)</td>
<td>7.9 (2.3)</td>
<td>35.9 (20.3)</td>
<td>25.5 (12.5)</td>
</tr>
<tr>
<td>Surgery</td>
<td>25,564</td>
<td>21</td>
<td>3 (14.3)</td>
<td>7.7 (2.6)</td>
<td>58.8 (43.9)</td>
<td>22.5 (12.0)</td>
</tr>
<tr>
<td>Cardiology</td>
<td>22,521</td>
<td>20</td>
<td>2 (10)</td>
<td>14.9 (8.0)</td>
<td>32.8 (24.4)</td>
<td>19.1 (11.5)</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>19,312</td>
<td>23</td>
<td>2 (8.7)</td>
<td>5.7 (4.2)</td>
<td>61.4 (49.8)</td>
<td>11.5 (12.5)</td>
</tr>
<tr>
<td>Total</td>
<td>445,192</td>
<td>209</td>
<td>31 (14.8)</td>
<td>9.5 (11.3)</td>
<td>51.6 (42.8)</td>
<td>47.6 (21.4)</td>
</tr>
</tbody>
</table>

Abbreviations: EIC, editor-in-chief; IF, impact factor.

* Data from the Association of American Medical Colleges.
| 190 unique journals.

Table 2. Association Between Sex and Gender Reporting Policies and Journal Characteristics

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Stated sex and/or gender reporting policy</th>
<th>Distinguish between or define sex and gender</th>
<th>Require reporting of methods used to determine sex and/or gender</th>
<th>Require collection of both sex and gender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes* (Mean (95% CI))</td>
<td>Yes* (Mean (95% CI))</td>
<td>Yes* (Mean (95% CI))</td>
<td>Yes* (Mean (95% CI))</td>
</tr>
<tr>
<td>2020 IF, mean (SD)</td>
<td>10.8 (13.1)</td>
<td>8.8 (10.3)</td>
<td>2.0 (−1.4 to 5.5)</td>
<td>4.9 (3.4 to 6.4)</td>
</tr>
<tr>
<td>Journal age, mean (SD), y</td>
<td>50.5 (46.1)</td>
<td>52.2 (41.2)</td>
<td>1.7 (−11.3 to 14.7)</td>
<td>6.7 (−7.6 to 21.0)</td>
</tr>
<tr>
<td>Women EIC, No./No. (%)</td>
<td>15/70 (21.4)</td>
<td>16/139 (11.5)</td>
<td>P = .07</td>
<td>11/50 (12.6)</td>
</tr>
</tbody>
</table>

Abbreviations: EIC, editor-in-chief; IF, impact factor.

Data from Journal Citation Reports.

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each of the 10 largest US medical specialties⁶ (eTable 1 in the Supplement) was performed to
determine if journals: (1) have a sex and/or gender reporting policy; (2) distinguish between or define
sex and gender; (3) require researchers to report their methods for determining sex and/or gender;
and (4) require collection of both sex and gender.

All-time journal citations, journal founding date, and perceived gender (via online pronouns
[he/she/they] or photographs if unavailable) of journal editor-in-chief (EIC) (April 1, 2022) were
collected. Two-sided \( P < .05 \) was considered statistically significant. Statistical analysis was
performed using GraphPad PRISM version 9.2.0 (GraphPad Software). Additional methodological
details including statistical analysis are available in eTable 2 in the Supplement.

Results

Author guidelines for 190 journals were analyzed (Table 1).⁶ Ten journals are among the top 20 for 2
different specialties. Among these 190 journals, 65 (34%) state a policy for reporting sex and/or
gender in their author guidelines; 46 (24%) explicitly distinguish between or define the terms gender
and sex; 31 (16%) recommend or require researchers to report their methods for determining sex and
gender; and 3 (2%) require researchers to report both sex and gender demographics.

Among the 10 specialties, obstetrics and gynecology had the largest percentage of top journals
with a sex and gender reporting policy (65% [13 of 20]), while ophthalmology had the smallest (25% [5 of 20]). One specialty (general medicine/internal medicine: 45%) had greater than 20% of
journals that instructed researchers to report their methods for determining sex and gender
in studies.

There was no significant difference in mean IF, mean journal age, or EIC perceived gender
between journals that have a sex and/or gender reporting policy and those that do not (Table 2).
Similarly, there was no difference in journal IF, mean journal age, or EIC perceived gender and the
presence of sex and gender definitions in author guidelines. Conversely, journals that require
reporting of methods used to determine sex and/or gender have a significantly higher IF (15.7 [95% CI, 9.5-21.9] vs 8.3 [95% CI, 6.9-9.7]) and a significantly greater proportion of EIC positions held by
women (29.4% [95% CI, 16.7%-46.3%] vs 12.0% [95% CI, 7.9%-17.7%; \( P = .02 \)) than those that do
not require methods reporting.

Discussion

There is a paucity of policies outlining appropriate collection and reporting of sex and gender
variables, even among the most influential biomedical journals. Despite guidance from organizations
that explicitly defines and differentiates these demographics,² few journals distinguish between
them, and even fewer recommend or require authors to report their methods for determining sex
and gender.

This study’s limitations included the inability to account for the entirety of the gender spectrum.
Although researchers must be held accountable for appropriate study design and reporting of sex
and gender variables, one cannot assume unequivocal adherence to expectations when journals
themselves do not have best practice guidelines for study design and reporting. Without these,
future research risks inaccurate results, reduced applicability, and exclusion of groups of historically
marginalized individuals from research.

ARTICLE INFORMATION

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**Author Contributions:** Dr. Jacobs had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

**Concept and design:** All authors.

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**Statistical analysis:** Bibb, Jacobs.

**Supervision:** Adkins, Booth.

**Conflict of Interest Disclosures:** None reported.

**REFERENCES**


**SUPPLEMENT.**

eTable 1. Journals Analyzed in the Included Research Study

eTable 2. Methodological Details for Variable Analysis of Journals