

Women in Leadership Positions in Dentistry: A Scoping Review

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ABSTRACT

Background: The objectives of this scoping review were to calculate the prevalence of women in leadership positions in dentistry, present existing research on gender disparities affecting dentistry globally, identify gaps in the literature that can drive future research, and provide recommendations for achieving gender parity in leadership positions.

Types of Studies Reviewed: A search was performed according to search terms using PubMed, Web of Science, CINAHL, Embase, Google Scholar, and Cochrane Central Register of Controlled Trials. The search strategies were developed to cover publications from January 2016 through April 2022 in the English language that examined the prevalence of women in leadership positions in dentistry. Abstracts, newsletters, qualitative reports, and letters to the editors were excluded.

Results: 18 studies met all inclusion criteria and were included in the final analysis. Low prevalence of women was noted in leadership positions in dentistry globally. Multiple reasons that have led to gender disparities were identified, and recommendations were provided for decreasing gender disparities and achieving gender equity in dentistry.

Practical implications: Several factors have contributed to gender inequalities in the field of dentistry over the years. However, during the last decade, gender equity, inclusion and diversity have started to be increasingly recognized as core values to the dental profession. Presenting and analyzing all available data surrounding this topic is of paramount importance in order to start formulating appropriate strategies to achieve gender parity in all areas of dental leadership.

26

27 **Key Words:** gender; equity; diversity; inclusion; disparities; gender gap; systematic review;
28 female

29

30 **INTRODUCTION**

31

32 In the United States, the number of female dental graduates has increased significantly over the
33 past decades, from 13.6% in 1980, 30.8% in 1990, 39.5% in 2000, 45.0% in 2010, to 51.4% (3,395)
34 of graduates of the class of 2020.¹ A similar trend is noted worldwide, with an increase in female
35 dental graduates every year. A crucial milestone was recently attained, when gender parity was
36 achieved in the graduating class of 2020. Women represent 60% of dentists across Europe. In
37 2016, 75% of dentists in Finland were women. In South Africa, the rise in female dental graduates
38 was noted in 2004, comprising 46% of the graduating class.² Despite an increase in the number
39 of women dentists and specialists over many years and a well-established pipeline, women
40 remain under-represented in the positions of academic leadership, editorial board members, and
41 managerial roles.³⁻⁸

42

43 At the women's executive forum in 2019, Dr. O'Loughlin, the first female executive director of
44 the American Dental Association (ADA), stated that women dentists make up 18% of dental
45 school deans and 28% of state dental society presidents.^{3,4} A study in the United States
46 highlighted that women comprised only 14.8% of the editorial board members of the major
47 dental journals.⁵ Another study completed in 2021 revealed that, of the 91 dental journals ranked
48 by impact factor on the Web of Science, only 15% of chief editors and 22.95% of associate editors
49 were women.⁶ Gender disparities also exist in the distinguished speaker lecture series, wherein
50 only 33% have been women despite the large numbers of women attendees and presenters.⁷

51

52 Several factors have been mentioned to explain gender inequality in leadership positions in
53 academic medicine and dentistry. These include the lack of appropriate role models and
54 mentorship, the lack of peer support for women's promotion through academic ranks, implicit
55 bias and negative stereotypes, personal choices, and childcare responsibilities.⁸

56

57 Gender diversity and inclusion at the leadership level are increasingly important across various
58 fields. The business case for diversity and inclusion is well established, with gender inclusion often
59 showing increased economic benefits of gender diversity at the leadership level.^{9,10} Gender
60 diversity at the leadership level has improved work quality and innovation, better decision-
61 making, higher employee satisfaction, and enriched organizational culture.^{9,11}

62

63 Similarly, in healthcare, including women in research teams has shown advances in women's
64 health and healthcare policies.¹²⁻¹⁴ Publications with women and men authors have increased
65 citations compared to gender-homogenous authorship. This illustrates the inherent value of
66 gender diversity, leading to improved research quality.^{11,12,14}

67

68 Despite this emerging evidence of the value of gender diversity at the leadership level, critical
69 knowledge gaps remain. Owing to the knowledge gaps, the continued rise in interest in gender
70 parity in medicine and dentistry, the economic and social benefits of gender diversity, the
71 complexity of the issue, and the diverse methodologies applied to the current body of literature
72 to examine professional gender disparities we conducted a scoping review. Such reviews are
73 conducted to examine emerging literature and identify gaps in the evidence, with the goal of
74 utilizing the review to influence the course of the prospective studies.¹⁵

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76

77 The primary objective of this scoping review is to calculate the prevalence of women in leadership
78 positions in dentistry. The secondary objectives of this study are 1) to deliver an outline of the
79 existing research on gender disparities affecting the field of dentistry globally; 2) to identify gaps
80 in the current body of literature that can drive future research; 3) to provide recommendations
81 for narrowing gender disparities and achieving gender parity in leadership positions. The findings
82 of this review will inform institutional leaders world-wide to develop interventions and policies
83 for achieving gender parity in leadership positions.

84

85 **METHODS**

86

87 Research Question:

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89 What is the prevalence of women in leadership positions in dentistry?

90

91 P: dentists in private practice and/or academia

92 I: women dentists

93 C: men dentists

94 O: prevalence of women dentists in leadership positions

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96 Framework of the Scoping Review:

97 The present study was based on the Preferred Reported Items for Systematic Reviews and Meta-

98 Analyses extension for Scoping Reviews (PRISMA-ScR). We applied Arksey and O'Malley's

99 (2005)¹⁶ and Levac and colleagues' (2010)¹⁷ framework for scoping reviews. According to their
100 framework, the scoping review includes five stages, as described below. The sixth stage is
101 optional and offers opportunities for consumer participation to provide suggestions beyond
102 those in the literature.¹⁶ Circulation of this published review will be considered a knowledge
103 transfer mechanism seeking consultation, which would fulfill the purpose of the sixth stage.¹⁷

104 Stage 1: finding the research question

105

106 We articulated our research question to guide the scope of inquiry and to identify publications
107 pertinent to gender and dentistry: prevalence of women in leadership positions in dentistry. Our
108 target population included women dentists in private practice and/or academics. Our outcome
109 variable was the prevalence of women in leadership positions, and our comparator was men
110 dentists in leadership positions.

111

112 Stage 2: identifying relevant studies

113

114 We performed the search according to search terms using PubMed, Web of Science, CINAHL,
115 Embase, Google Scholar, and Cochrane Central Register of Controlled Trials. Search terms
116 comprised a combination of keywords and MeSH terms (**Suppl. Table 1**). The search strategies
117 were developed to cover publications from January 2016 through April 2022 in the English
118 language that examined the prevalence of women in leadership positions within the specialty of
119 dentistry. We also reviewed the references of the articles to identify any additional relevant
120 publications. We defined leadership roles as dean, chair, full professor, program director,
121 president, board of director, editorial board member, women speakers, or women authors in
122 senior positions. Abstracts, newsletters, qualitative reports, and letters to the editors were

123 excluded, as sufficient methodological details were lacking in these articles to allow quality
124 assessment.

125

126 Stage 3: study selection process

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128 After screening the titles and abstracts, full-text screening of the publications was performed
129 employing the inclusion and exclusion criteria. Inclusion criteria consisted of the studies focusing
130 on women in leadership positions within the specialty of dentistry. All the authors independently
131 reviewed titles, abstracts, and full texts. Duplicate records were excluded. Articles were excluded
132 if full texts were not available. Furthermore, the article was not included in the scoping review if
133 the women's prevalence in leadership positions was not documented or if the article focused in
134 the area of healthcare but did not include any information on dentistry. Review articles and
135 articles that did not follow an original research design (such as opinion articles or articles using
136 facts from websites) were also excluded. All authors met at the beginning, midpoint, and final
137 stages of the study selection phase. All disagreements were resolved verbally, strictly adhering
138 to the predetermined inclusion criteria.

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140 Stage 4: mapping the data

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142 The research team collectively developed the data abstraction form, which included the following
143 variables: year of publication, authors, title, country, methodology or study design, type of
144 leadership position, percentage of women to calculate the prevalence, specialty, name of the
145 journal in which the selected article was published, journal's impact factor (as recorded in 2022),
146 gender of the editor-in-chief of the journal, selected article's first and last author, interventions,

147 and barriers (**Table 1**). Data extraction was performed independently by three of the study
148 authors ([blinded for review]). Any disagreements were resolved collectively by all study authors.

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150 Stage 5: collating, summarizing, and reporting results

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152 Studies were evaluated to measure the prevalence of women in leadership positions in dentistry
153 and its specialties across the globe in all arenas, namely private practice, academia, and the
154 military. Studies were then analyzed qualitatively.

155

156 Risk of Bias Assessment:

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158 Included articles were evaluated for their quality using the AXIS tool.¹⁸ Previous systematic
159 reviews that have included cross-sectional studies have applied this tool to appraise the quality
160 and risk of bias assessment.¹⁹ The AXIS tool comprises 20 questions. Question 1 relates to the
161 aims and objectives of the study. Questions 2-11 pertain to methodology. Questions 12-16 focus
162 on results. Questions 17-18 and 19-20 concern the study's discussion section and other
163 questions, respectively. A score of 1 was assigned if the answer to the question was "yes" and a
164 score of "0" was given if the answer to the question was "no." For all questions, "yes" indicated
165 the study fulfilled the criteria posed by the question of the assessment tool, except for question
166 number 19. This question pertains to any funding sources or conflicts of interest that may affect
167 the author's interpretation of the results, and an ideal response would be "no" (**Table 2**).

168

169 **RESULTS**

170

171 The database search revealed 17,854 articles for the initial review. After the removal of
172 duplicates, 17,058 articles remained. These articles were screened for their titles and abstracts
173 and 16,810 articles didn't meet the inclusion criteria. Thus 248 articles remained for the full-text
174 review. Finally, only 18 studies met all inclusion criteria and were included in the final analysis
175 **(Figure 1).**

176

177 Academia: Deans, Chairs, and Program Directors

178

179 Leadership positions in academic dentistry include deans, chairs, and program directors. A survey
180 study by da Fonseca et al., showed that 31.8% of women chair the department of pediatric
181 dentistry, in the United States and Canada.²⁰ Similar results were obtained by Townsend et al.,
182 with 30.23% being the prevalence of women chairs in pediatric dentistry.²¹ A retrospective
183 analysis by Sukotjo et al., concluded that only 6% of prosthodontic programs in the United States
184 have women program directors.²² Bompolaki et al., in their observational study, found that 18%
185 of the deans in the United States are women. The authors also found that the mean percentage
186 of women in leadership positions was 40.26%. Furthermore, the percentage of women in the
187 leadership teams was higher in schools with a woman dean.⁴

188

189 Organized Dentistry: Presidents and Board of Directors

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191 Leadership positions in organized dentistry include presidents and board of directors. A cross-
192 sectional study by Li et al., revealed that 28% of women in the United States and 34.9% in Canada
193 hold a leadership role in North American dental associations.²³ Phasuk et al., in their
194 observational study, calculated the percentage of women presidents in ten select prosthodontic
195 organizations across the world. The authors documented that European Prosthodontic

196 Association (EPA) had 20% of women presidents, whereas the American Prosthodontic Society
197 (APS) had no women presidents over the time frame of 2000-2019.²⁴

198

199 Research: Editorial Board Positions

200

201 Leadership roles in research involve editorial board positions. Bakht et al., in their cross-sectional
202 study noted that women on the editorial boards of medical and dental journals in Pakistan are
203 under-represented at 17.51%.²⁵ A review study by Tiwari et al., emphasized this under-
204 representation, reporting that women constitute 14.8% of the editorial board members of major
205 dental journals in the United States.⁷ Bennie et al., performed a retrospective analysis to report
206 women chief and associate editors of prominent dental journals, globally. The authors
207 documented a prevalence of women chief editors of 15% and women associate editors of
208 22.95%.⁶

209

210 Academic Ranks: Full Professors

211

212 In addition to leadership positions, the present study also investigated the prevalence of women
213 in academic ranks such as full professor. Burke et al., found a significant difference in the
214 distribution of academic ranks between men and women oral and maxillofacial surgeons, with
215 only 4.3% of women as professors in the specialty.²⁶ This number appears to be higher at 32.35%
216 in pediatric dentistry, as reported by Karhade et al.²⁷ In general dentistry, Simon et al. collected
217 data from eight dental schools in the United States which received the most funding from the
218 National Institute of Dental and Craniofacial Research in 2017; the authors indicated that 24.4%
219 of full professors at these schools were women.²⁸ Internationally, Tiwari et al., noted that 49% of
220 postgraduate programs had appointed women deans in Brazil. In Kenya, there is no

221 representation of women in the roles of department heads and full professor ranks, whereas, in
222 Denmark, 22% of full professors are women.⁷ Le Boedec et al., in France performed an
223 observational study to assess gender inequality and concluded that 44.3% of full professors in
224 dentistry were women. The authors also reported that only 21.7% of full professors in
225 maxillofacial surgery were women.²⁹

226

227 Conferences: Women Speakers

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229 The present study also researched the percentage of women speakers at major conferences.
230 Tiwari et al., reviewed the distinguished lecture series at the international association for dental
231 research (IADR) and American association for dental research (AADR) meetings. They found that
232 over the span of 18 meetings since 2017, 33% of total distinguished lecture series speakers have
233 been women.⁷ Phasuk et al., in their observational study, found that women speakers at any
234 scientific meetings of six different prosthodontic organizations in the United States over ten years
235 comprised of only 10.8%.³⁰ Silva et al. found that women speakers gave 25% of presentations at
236 the 37th Australian dental congress and 36% of presentations at the 38th Australian dental
237 congress.³¹ Heggie et al., in the UK analyzed the data on national conference programs obtained
238 from 13 dental specialty societies and the British dental association (BDA) for 2018 and 2019 and
239 concluded that 39.8% were women speakers.³²

240

241 Publications: First and Last Authors

242

243 Lastly, academic growth and progress also depend on contributions to the literature in the form
244 of publications. The authors of the present study reviewed the prevalence of women authors in
245 senior and leading positions. Consky et al., conducted a retrospective cohort study of articles

246 published in the Journal of Oral and Maxillofacial Surgery. Their analysis accounted for threetime
247 points: 1995, 2005, and 2015. It was determined that women’s first and last authors ranged from
248 3 to 6.3% during the time points examined, which was significantly less than expected.³³
249 Schumacher et al., performed a similar analysis in orthodontics and reported that 30.1% of the
250 publications within 2018–2020 were attributed to women senior authors.³⁴

251

252 **DISCUSSION**

253

254 The present scoping review was performed to answer: what is the prevalence of women in
255 leadership positions in dentistry? The objectives of this scoping review were: 1) to deliver an
256 outline of the existing research on gender disparities affecting the field of dentistry globally; 2)
257 to identify gaps in the current body of literature that can drive future research; 3) to provide
258 recommendations regarding decreasing gender disparities and achieving gender parity in the
259 field of dentistry.

260

261 Existing research on gender disparities:

262

263 The current scoping review identified several reasons that have led to gender disparities in
264 dentistry (**Table 3**). Lack of mentorship and sponsorship for women,^{4,21,28,33} financial
265 inequality,^{4,7,27,28} lack of women leaders as role models,^{7,21,23,24,29,31} intentional (explicit bias), or
266 unintentional (implicit bias) against women,³⁰⁻³² and lack of supportive arrangements for
267 maternity and family breaks,³⁴ were reported challenges faced by women in dentistry. Familial
268 factors were also noted to create barriers to women’s advancement. Women tend to be the
269 primary caregiver and are deeply involved in child care, thereby not being able to dedicate the
270 amount of time required for promotion, tenure, and acquirement of leadership roles.^{28,29,31}

271 Similarly, in the research arena, women experience bias in the grant application.^{23,28} Women are
272 known to have limited access to funding for research, and their underrepresentation as senior
273 faculty and on editorial boards intensifies challenges.⁷ Low research productivity and lack of
274 leadership roles reflect poorly on their resumes further limiting their opportunities to obtain
275 funding and promotions.⁷

276

277 Gaps in the Literature:

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279 So far, a great deal of work has been done in identifying the areas of women's under-
280 representation in leadership roles in dentistry. All the studies included in the scoping review have
281 reported measurable outcomes by querying various databases or through survey studies. This
282 evidence-based approach has demonstrated a low prevalence of women in leadership positions.
283 These studies have speculated the barriers causing low prevalence but have not investigated the
284 exact reasons for such low numbers. This would require designing a survey study or interviews
285 specifically targeting women, focused on acquiring data on personal challenges faced when they
286 apply for promotion in various leadership roles. Furthermore, conducting a comparative analysis
287 of barriers encountered and experiences of men and women in leadership positions would be
288 beneficial.

289

290 Recommendations and Perspectives:

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292 To reduce the gender disparity, continued efforts will be required to change the culture of
293 practice in dentistry, academia, the research arena, and settings of organized dentistry. Support
294 from institutions, organizations, and research committees will be much needed to promote and
295 increase women's leadership and representation.²³ Additionally, equitable compensation and

296 scholarship opportunities for female faculty may help improve gender parity in academic
297 dentistry.²⁷ Acknowledging and becoming cognizant of implicit bias with the goal of eradicating
298 it, is a crucial first step in addressing gender disparities. Some of the other practical solutions are
299 creating quotas in leadership positions and establishing mentorship programs.²⁹ Selecting more
300 women in leadership roles would create more role models for younger women and encourage
301 them to follow similar paths in academics, organized dentistry, and research settings.⁴ This forms
302 the basis of social justice and equity considerations.

303

304 Social justice and equity considerations suggest that underrepresentation in medicine and
305 dentistry is a biased healthcare inequality and should be addressed by society at large.³⁵ Civil
306 Rights Act formed the basis of supporting diversity and inclusion, thereby affirming its value in
307 business and social justice cases.³⁵ Since then, it has been noted that the implementation of
308 strategies that promote inclusion and diversity within American and global businesses results in
309 positive outcomes, such as improved products and customer service, increased net income, and
310 adoption of novel viewpoints.³⁵ Similarly, academic medicine and dentistry have adopted
311 inclusion and diversity as a core value to advance their missions of patient care and service.

312

313 However, a few things should be considered to succeed in achieving diversity and inclusion.
314 Organizations, institutions, journals, and congress organizers should demonstrate that diversity
315 and inclusion are a part of normal business rather than “special issues.” Women and others from
316 underrepresented populations may be appointed to leadership positions where their
317 probability for success is limited.³⁶ In a fictional scenario to study status quo bias, men were more
318 likely to be chosen by college students than women to replace a retiring male leader of a
319 successful company - men were chosen by 62% of the participants. In contrast, in a scenario
320 where the company was struggling, women were preferred to replace a retiring male leader by
321 69% of the participants.³⁷ In a follow-up experiment, college students were asked to read a

322 scenario of either a successful or a struggling company that was about to replace its CEO. One
323 male and one female candidate were proposed as replacements and each was
324 attributed stereotypical male and female attributes (male: decisiveness and competitiveness;
325 female: communication skills, encouraging). For a company doing well, men were chosen as the
326 next CEO by 67% of study participants, and when the company was struggling, women were
327 chosen as the next CEO by 63% of the participants.³⁷ These findings support the term "glass cliff"
328 to describe how women have a better chance to break through the "glass ceiling" during times
329 of crisis.³⁸ However, women who do so in this situation are more likely to fail as leaders because
330 the odds of success are lower. Women need to be cognizant of the "glass cliff" when seeking
331 leadership positions and evaluating whether the opportunity is set up for them to showcase
332 leadership success. If a woman fails in her first major leadership role, she may not get a second
333 chance.

334

335 Limitations and Strengths:

336

337 This scoping review has several limitations. First, the search strategies were developed to cover
338 publications from January 2016 through April 2022, in the English language. This time frame and
339 language restriction may have led to exclusion of relevant articles. In addition, all included studies
340 followed a cross-sectional study design which has its inherent weaknesses. Lastly, we did not
341 study the effects of race and ethnicity, and under-represented groups interconnected with
342 gender and hopefully can be considered as a critical area of future research as the global
343 population is diversifying. Most English language research on gender diversity at the leadership
344 level was performed in USA and Europe. This may have resulted in biased perspectives, and
345 interventions may not be universally applicable. Furthermore, an inherent weakness of much of
346 the literature is the provision of vague solutions to the barriers experienced by women
347 attempting to reach the leadership levels. For example, several articles in this review suggest

348 interventions such as “support” for women or “change the organizational culture.” Although
349 needed, these are vague statements suggesting the need to create a detailed stepwise solution
350 to achieve gender parity. Despite these limitations, this study brings its own significance in that
351 it is the first scoping review to calculate the prevalence of women in different kinds of leadership
352 positions in the various specialties of dentistry across the globe.

353

354 **CONCLUSION**

355

356 The prevalence of women in leadership positions in dentistry is low. The current scoping review
357 identified several reasons that have led to gender disparities in dentistry. The review also
358 provides recommendations regarding decreasing gender disparities and achieving gender parity
359 in dentistry. However, more research is required to acquire factual data on personal challenges
360 faced by women when applying for promotion in various leadership roles. Future research should
361 focus on a comparative analysis of barriers encountered and experiences of men and women in
362 leadership positions.

363 **Table 1: Characteristics of Studies Included in the Review Article**

364 **Table 2: Risk of Bias Assessment**

365 **Table 3: Barriers in Achieving Gender Parity**

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367 **Figure 1: Prisma Flow Diagram**

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369 **Supplementary Material:**

370 **Suppl. Table 1: Database Search Strategies**

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483

Figure 1. PRISMA Flow Diagram

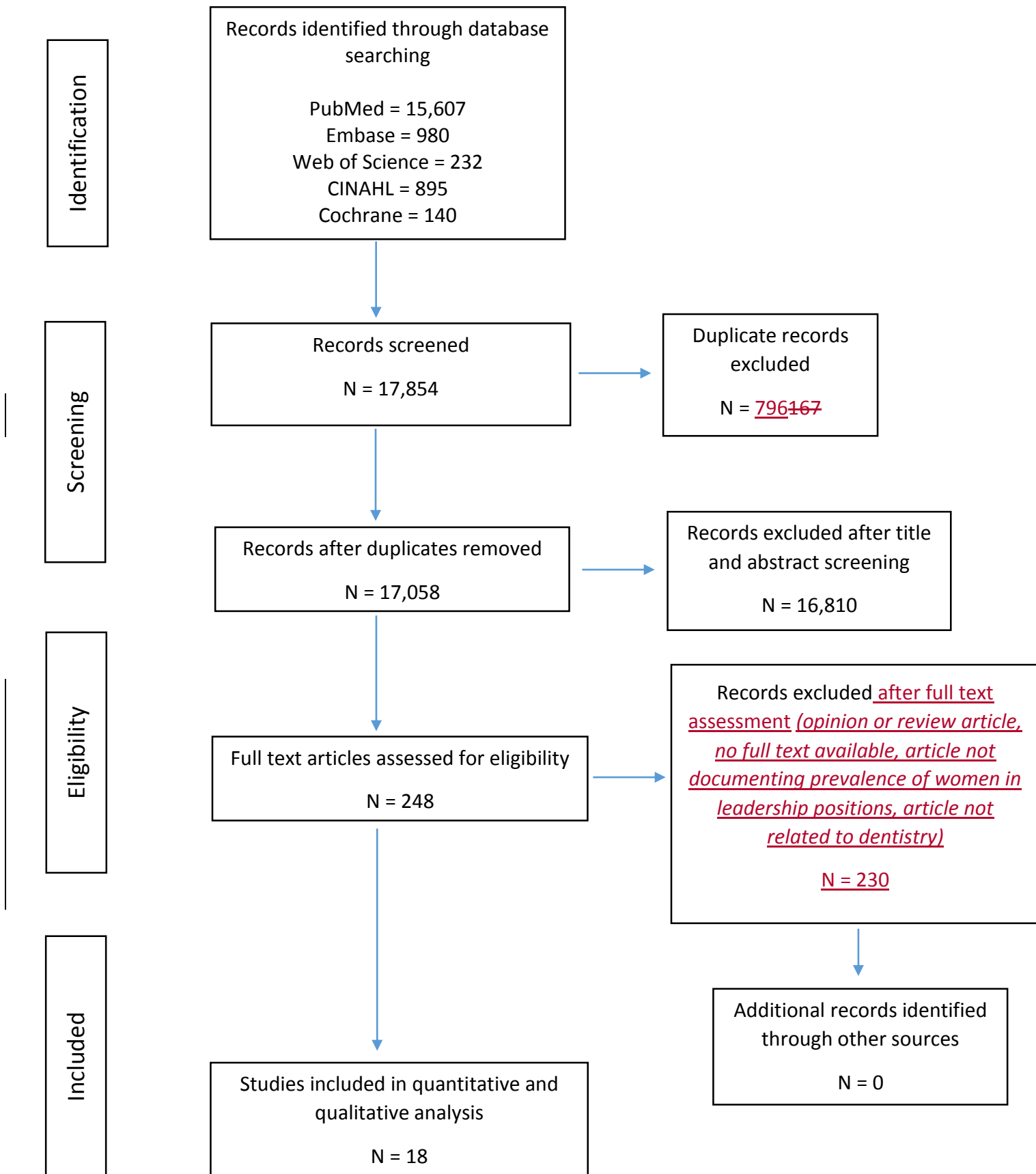


Table 1: Characteristics of Studies Included in the Review Article

Authors	Year ¹	Study Design	Country	Position	Prevalence	Specialty	Journal, impact factor ² , editor-in-chief gender	Gender First Author	Gender Last Author
Bompolaki et al	2021	Observational study	USA	Dean and Female leadership	18% (Dean) 40.26% (Female leadership)	Dentistry	Journal of Dental Education, 2.264, Male	Female	Male
Bennie et al	2021	Retrospective analysis	Global	Chief and Associate editors of prominent dental journals	15% (Chief editors) 22.95% (Associate editors)	Dentistry	Journal of Dentistry, 3.456, Male	Female	Male
Bakht et al	2017	Cross sectional study	Pakistan	Editorial board	17.51%	Dentistry and Medicine	Journal of the Pakistan Medical Association, 0.781, Female	Female	Male
Burke et al	2019	Cross sectional study	USA	Academic rank	4.3%	OMFS Oral & Maxillofacial Surgery	Journal of Oral and Maxillofacial Surgery, 1.895, Male	Female	Male
Consky et al	2020	Retrospective cohort study	USA	Female authorship (first and senior)	Year 2015: 3.87% (first) 4.90% (senior)	OMFS Oral & Maxillofacial Surgery	Journal of Oral and Maxillofacial Surgery, 1.895, Male	Female	Female
da Fonseca et al	2019	Survey study	USA and Canada	Chair	31.8%	Pediatric Dentistry	Pediatric Dentistry, 1.594, Male	Male	Male
Heggie et al	2021	Descriptive analysis	UK	Speakers	39.8% (Speakers)	Dentistry	British Dental Journal, 1.626, Male	Female	Female

Table 1: Characteristics of Studies Included in the Review Article

Karhade et al	2019	Retrospective cohort study	USA	Academic rank	32.35%	Pediatric Dentistry	Pediatric Dentistry, 1.594, Male	Female	Female
Le Boedec et al	2021	Observational study	France	Full professors	44.3% (Full professors, dentistry) 21.7% (Full professors, maxillo-facial surgery)	Dentistry	PLOS ONE, 3.24, Female	Male	Male
Li et al	2019	Cross sectional study	USA and Canada	Leadership in associations, Editor-in-Chief, and AADR ³ Presidents	28% (USA) 34.9% (Canada)	Dentistry	Advances in Dental Research, 3.915, Information not available	Female	Female
Phasuk et al	2020	Observational study	International	President	20% (EPA⁴) 0% (APS⁵)	Prosthodontics	The Journal of Prosthetic Dentistry, 3.426, Male	Male	Male
Phasuk et al	2020	Observational study	USA	Speakers	10.8%	Prosthodontics	The Journal of Prosthetic Dentistry, 3.426, Male	Male	Male
Schumacher et al	2021	Retrospective analysis	Global	Senior authors	30.1%	Orthodontics	European Journal of Orthodontics, 3.075, Male	Female	Female
Silva et al	2020	Retrospective analysis	Australia	Speakers	25% (37th congress) 36% (38th congress)	Dentistry	JDR Clinical and Translational Research, 2.375, Female	Female	Female
Simon et al	2019	Retrospective analysis	USA	Professor	24.4%	Dentistry	Journal of Women's Health, 2.322, Female	Female	Male

Table 1: Characteristics of Studies Included in the Review Article

Sukotjo et al	2018	Retrospective analysis	USA	Program directors	6%	Prosthodontics	Journal of Dental Education, 2.264, Male	Male	Male
Townsend et al	2020	Survey study	USA and Canada	Chair	30.23%	Pediatric Dentistry	The Journal of Clinical Pediatric Dentistry, 1.065, Male	Female	Male
Tiwari et al	2019	Review	Global	Editorial board, Speakers, Academic ranks based on countries - Brazil, Kenya, Denmark	14.8%, 33%, 49%, 0%, 22%	Dentistry and Medicine	Advances in Dental Research, 3.915, Information not available	Female	Female

¹Year: = ~~p~~Publication year

²Impact factor: as recorded in 2022

~~OMFS = Oral and Maxillofacial Surgery~~

³AADR: = American ~~A~~ssociation for ~~D~~dental ~~R~~esearch

⁴EPA: = European Prosthodontic Association

⁵APS: = American Prosthodontic Society

Table 2: Risk of Bias Assessment (green indicates low risk of bias; red indicates high risk of bias)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
Bompolaki et al, 2021	1	1	1	1	1	1	N/A	1	1	1	1	1	N/A	N/A	1	1	1	1	0	1
Bennie et al, 2021	1	1	1	1	1	1	N/A	1	1	1	1	1	N/A	N/A	1	1	1	1	0	1
Bakht et al, 2017	1	1	1	1	1	1	N/A	1	1	0	1	1	N/A	N/A	1	1	1	0	0	N/A
Burke et al, 2019	1	1	1	1	1	1	N/A	1	1	1	1	1	N/A	N/A	1	1	1	1	0	N/A
Consky et al, 2020	1	1	1	1	0	0	N/A	1	1	1	1	1	N/A	N/A	1	1	1	1	0	1
da Fonseca et al, 2019	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	1	1	1	0	1
Heggie et al, 2021	1	1	1	1	1	1	N/A	1	1	0	1	1	N/A	N/A	1	1	1	1	0	N/A
Karhade et al, 2019	1	0	1	1	0	0	N/A	1	1	1	1	1	N/A	N/A	1	1	1	1	0	1
Le Boedec et al, 2021	1	1	1	1	1	1	N/A	1	1	1	1	1	N/A	N/A	1	1	1	1	0	N/A
Li et al, 2019	1	1	1	1	1	1	N/A	1	1	1	1	1	N/A	N/A	1	1	1	1	0	N/A
Phasuk et al, 2020	1	1	1	1	0	1	N/A	1	1	1	1	1	N/A	N/A	1	1	1	0	0	N/A
Phasuk et al, 2020	1	1	1	1	1	1	N/A	1	1	1	1	0	N/A	N/A	1	1	1	1	0	N/A
Schumacher et al, 2021	1	1	1	1	0	0	N/A	1	1	1	1	1	N/A	N/A	1	1	1	1	0	N/A
Silva et al, 2020	1	1	1	1	0	1	N/A	1	1	0	1	1	N/A	N/A	1	1	1	1	0	N/A
Simon et al, 2019	1	1	1	1	0	0	N/A	1	1	1	1	1	N/A	N/A	1	1	1	1	0	1
Sukotjo et al, 2018	1	1	1	1	1	1	N/A	1	1	1	1	1	N/A	N/A	1	1	1	1	0	1
Townsend et al, 2020	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	0	1
Tiwari et al, 2019	1	1	1	1	1	1	N/A	1	1	0	1	1	N/A	N/A	1	1	1	1	0	N/A

Questions of AXIS tool: Yes = 1, No = 0

1. Were the aims/objectives of the study clear?
2. Was the study design appropriate for the stated aim(s)?
3. Was the sample size justified?
4. Was the target/reference population clearly defined?
5. Was the sample taken from an appropriate population base?
6. Was the selection process likely to select subjects that were representative of the target population under investigation?
7. Were measures undertaken to address and categorize non-responders?
8. Were the risk factors and outcome variables measured appropriate to the aims of the study?
9. Were the risk factor and outcome variables measured correctly using instruments/measurements that had been piloted or published previously?
10. Is it clear what was used to determine statistical significance and or precision estimates? (eg: p-values, CIs)
11. Were the methods (including statistical methods) sufficiently described to enable them to be repeated?
12. Were the basic data adequately described?
13. Does the response rate raise concerns about non-responder bias?
14. If appropriate, was information about non-responders described?
15. Were the results internally consistent?
16. Were the results for the analyses described in the methods, presented?
17. Were the author's discussions and conclusions justified by the results?
18. Were the limitations of the study discussed?
19. Were there any funding sources or conflicts of interest that may affect the author's interpretation of the results?
20. Was ethical approval or consent of participants attained?

Table 3: Barriers in Achieving Gender Parity

BARRIERS	Articles
Biological factors (e.g. <u>pregnancy</u> , child birth, pregnancy , <u>child rearing</u>), <u>which may also delay promotion of women to leadership positions</u> , <u>marriage, lead at later age</u>	22, 23, 29, 31, 33
Disproportionate workload	4, 20, 27
Explicit bias	4, 7, 21, 23, 24, 29, 30, 31, 32, 33
Glass ceiling	25, 26
<u>Lack of inclusion and/lack</u> decision making <u>power</u> , little authority	20, 25
Institutional biases e.g. remuneration, unfair hiring practices, lack of transparency	4*, 21, 23, 25*, 26*, 27*, 28*
Lack of guidance, no/unrealistic job description	20, 21, 25
Lack of peer/organizational support and poor organizational culture	20, 21, 25, 28, 29, 32, 34
Lack of role models/representation	4, 7, 20, 21, 23, 24, 29, 31, 33
Lack sponsorship, less resources, grant application biases	28, 7, 33
Leadership style	21
Leaky pipeline and/or lack of pipeline and meritocracy myth	4, 6, 24, 26, 27, 33
Psychological factors e.g. increased stress, low self-esteem, imposter syndrome, personal expectations	4, 20, 21, 25, 32, 33
Stereotypes and implicit biases	23, 24, 30, 31, 32, 34
Traditional roles/responsibilities or social factors e.g. marriage, career breaks	7, 22, 23, 25, 27, 28, 29, 31, 33, 34
Work less valued than men	21
Work-life balance and/or support for it	4, 28, 31

*Includes remuneration gap

Table 3: Barriers in Achieving Gender Parity

INTERVENTIONS	ARTICLES
Change core goals and update mission statements	6, 24
Change organizational culture	6, 26
Conference about gender equality	29
Educate global community, other leaders	7, 34
Effective onboarding processes	20
Evaluate drivers in countries with gender equity	7
Future research on assessing progress or audits	7, 34
Incentives to increase representation	4, 24
Inclusion	4, 6
Increase /equal opportunities / equality	4, 25, 27, 32, 34
Increase awareness of unconscious bias	4
Increase compensation	27
Increase representation and/or reflect membership	4, 23, 24, 25, 28, 29, 30, 31, 32, 34
Increased transparency in processes e.g. selection, promotion, publication	6, 7, 20
Leadership training/skills development, support integration	20, 21, 29
Mentorship	4, 20, 21, 25, 26, 29
Need cooperation from men/work together i.e. not just women's issue	6
Networking opportunities for women e.g. breakfast meeting	22
Pipeline programs	7
Programs to encourage academic productivity	28
Publish changes made	30
Punishments for lack of representation	24, 29
Reasons for failure to comply must be given	30
Recognition and promotion of women	26, 34
Research and/or publish data on demographics, or to promote women	7, 22, 30, 33
Safe and respectful working environment	4
Special issues e.g. women only congresses, journal issues etc.	22, 29
Support women	28, 29
Systematic approach to identify key drivers of inequity, recognise inequality	31, 34
Technology to improve mentoring	7
Time limits	30
Use technology to improve networking, mentorship, sharing experiences	7