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REVIEW

Sociodemographic Profile: A Forgotten Factor in Temporomandibular Disorders? A Scoping Review

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Abstract: The literature on Temporomandibular Disorders (TMD) incidence commonly reports sociodemographic factors such as gender and age. However, the role and prevalence of other sociodemographic factors in TMD are not well defined. Therefore, this scoping review aimed to report the prevalence of sociodemographic factors in TMD patients. A systematic search was conducted in the PubMed and Web of Science databases to identify clinical trials in adult populations, using the Research Diagnostic Criteria for TMD (RDC/TMD) or the Diagnostic Criteria for TMD (DC/TMD) and reporting sociodemographic data in TMD patients. Twenty-seven studies meeting the criteria were included in this review. The most commonly reported sociodemographic factors assessed in the included studies were age, race, education, job, income, and marital status. TMD prevalence was observed to be higher among younger and divorced individuals among the included studies. However, conflicting results were found for education level, and employment was not considered a risk factor for TMD. Although this review has methodological limitations, it suggests an association between TMD incidence and certain sociodemographic factors; nevertheless, further studies are needed to establish this relationship more conclusively.

Keywords: temporomandibular joint disorders, sociodemographic factors, orofacial pain

Introduction

Temporomandibular disorders (TMDs) are the most prevalent group and the most common source of chronic pain in the orofacial area.[1,2] They are characterized by pain in the temporomandibular joints (TMJ) and masticatory muscles, noises of the TMJ during mandibular function, and by restriction in jaw movements.[1,3,4] Painful TMDs have been shown to be biopsychosocial and multifactorial disorders; hence, there is not a singular cause that can explain the onset of painful TMDs.[5] Notwithstanding, the psychological profile, state of pain amplification and general health and global symptoms have been proposed to play an important role in the etiology of painful TMDs,[5–7] which are probably adjusted by gene expression and affected by environmental contributions such as social and demographic factors.[6]

In addition, the most common sociodemographic factor reported by the literature related with TMDs incidence is the gender frequency, which is higher in females than in males, and age prevalence, being greatest among people between 18 and 44 years old.[5,8] However, while other sociodemographic factors disparities like race, social and ethnicity have been associated with clinical pain experiences in many health conditions,[9–11] their role in TMDs is not clear, especially regarding TMDs onset.[6] In the same way, discrepancies have been described in subgroups with different socioeconomic status. Further, it seems that educational attainment and factors associated with moving to another country are less important predictors, even though could influence TMDs pain.[12,13]

Most clinical trials in the field of TMDs use the Research Diagnostic Criteria for TMD (RDC/TMD),[14] or its updated version, the Diagnostic Criteria for TMD (DC/TMD),[15] as a diagnostic tool that also assesses the sociodemographic profile of

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patients. Intriguingly, even though they assess the sociodemographic profile of the included patients, these data are rarely reported. Both the RDC/TMD and the DC/TMD include questions regarding age, race, sex, marital status, ethnicity, level of schooling and family income, which as explained before, could influence the onset of TMDs.[14,15] Therefore, since the actual knowledge about the role of sociodemographic factors is scant, but merits attention for both scientific and public health reasons, it is important to summarize the current findings to provide a basis to construct TMDs patients sociodemographic profile as well as suggestions for future researches. Taking this into account, the aim of the present scoping review is to report the prevalence of sociodemographic factors in TMDs patients using the RDC/TMD and DC/TMD.

Materials and Methods

Search Strategy and Selection Criteria

During February 2023, a search of the literature was performed using the following Medical Subjects Headings (MeSH) and related terms: [Temporomandibular Joints disorders] OR [Temporomandibular disorders] OR [TMD] AND [sociodemographic factors] OR [sociodemographic] AND [Research Diagnostic Criteria for Temporomandibular Disorders] OR [RDC/TMD] AND [Diagnostic Criteria for Temporomandibular Disorders] OR [DC/TMD] in the National Library of Medicine Medline (PubMed) and Web of Science databases to identify a list of potential papers for inclusion in this scoping review. In addition, search expansion strategies were also used to identify other potentially relevant citations (ie, hands-on search in private libraries and reference lists of the included articles).

The inclusion criteria were limited to: (1) studies written in English published from January 1992 to February 2023, (2) articles on adult populations (if adults and teenagers/children were included in the same study, just adult data was considered for the analysis), (3) clinical trials focused or reporting sociodemographic data in TMD patients, (4) studies using the RDC/TMD and DC/TMD as diagnostic tools. Manuscripts using different diagnostics tools, not reporting the criteria for TMD diagnosis, reporting data on TMD prevalence only in teenagers/children, or unrelated to the review aim and case reports were excluded.

Assessment of Papers

Two of the authors (I.C. and G.D.C.) independently reviewed the titles and abstracts of all articles, and potential articles were obtained in full text for careful read to check the eligibility. In all cases of disagreement between reviewers regarding the potential inclusion of an article or data interpretation, a third author (R.P.) was involved. Then, after final selection and inclusion of articles for the review, another author (M.B.C.S.) performed data extraction based on the Population Exposure Comparison Outcome (PECO) strategy.[16] The population ("P") was described including the sample size. The exposure ("E") concerned information on the study design, diagnostic tool used, and TMD diagnoses. The comparison ("C") included if data for the control group if present depending on the study design. The outcome ("O") was reported in terms of sociodemographic frequency data.

Results

Overview

The literature search identified 316 articles, of which eight were overlapping articles retrieved in both databases. From the 308 articles screened by title and abstract, 181 were read in full for eligibility. Of these, 151 were excluded for not fulfilling the inclusion criteria, and three were excluded since it was not possible to retrieve the full text. Therefore, a total of 27 manuscripts were included in the review (Figure 1).

The included articles covered a wide spectrum of populations of different sex, age and ethnic background. The age of the subjects varied from ≥15 years to ≤80 years, and the sample size ranged from 15 to 4289 participants with and without TMD. Regarding the sex distribution, a predominance of females was found (Table 1).

Summary of the Studies

Most of the included studies aimed to investigate the role of sociodemographic characteristics and their association with TMDs. Besides sociodemographic aspects, such as age, race, education, job, income, and marital status, two manuscripts

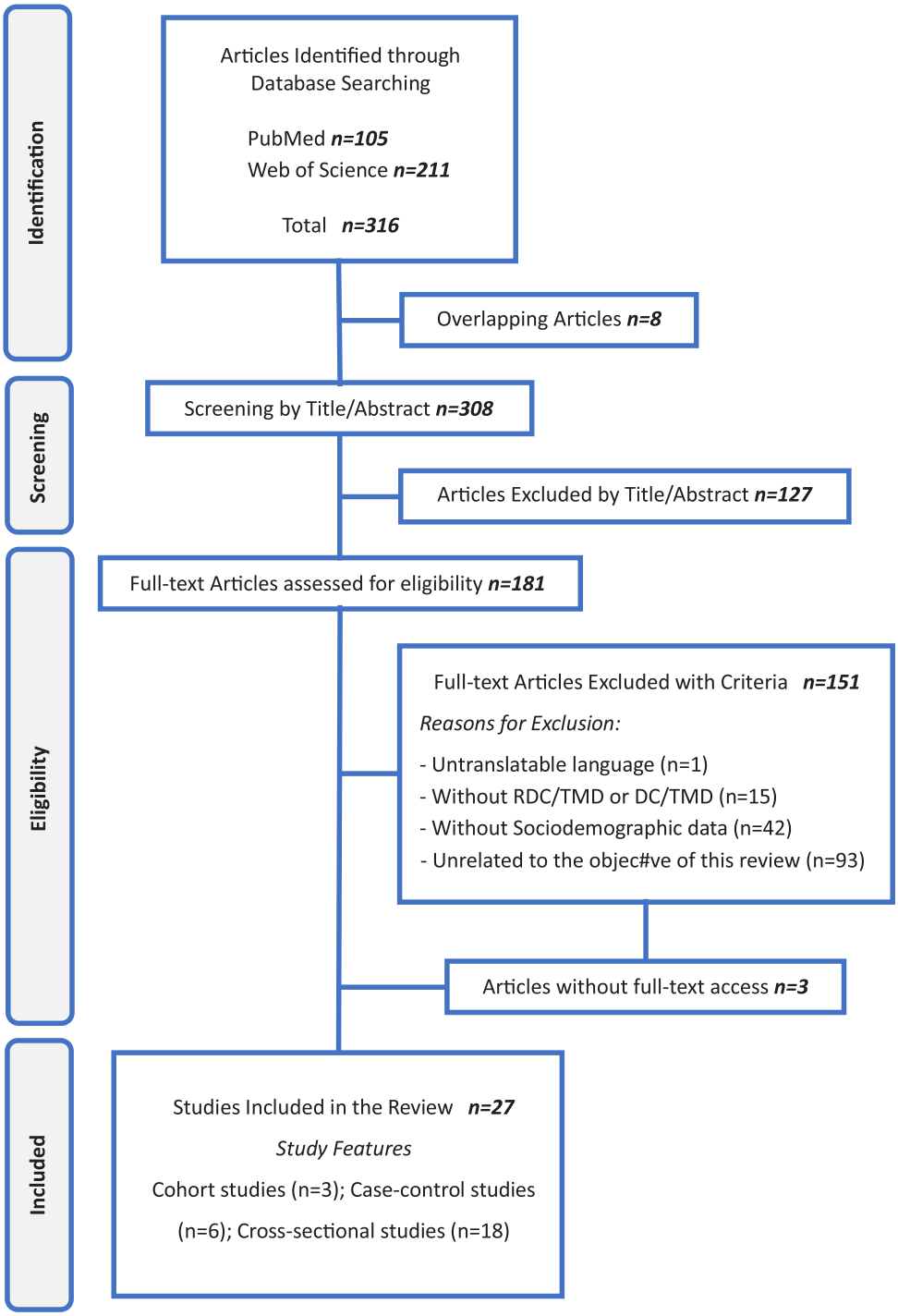

Figure 1 Flow diagram of the literature search strategy.

investigated features related to height, weight, and BMI. Further, psychological characteristics and parafunctional habits were investigated in most studies but are not presented in this scoping review since they do not relate to the present aim (Table 2).

The environment in which each study was conducted differed substantially from each other. While there were epidemiological studies aiming to access the influence of socioeconomic features, some papers were developed to investigate specific situations, such as patients with Parkinson's disease, COVID-19 pandemic, headaches, etc. Thus,

Table 1 Characteristics of the Included Studies

Study First Author, Year	Study Design	Diagnostic Criteria	Population
Velly, 2002[17] (Canada)	Case-Control	RDC/TMD	N = 59 (43 W, 16 M, mean age = 36 y) with **Disc Displacement** (75% with reduction, 12% without reduction, 13% with arthralgia osteoarthritis-osteoarthrosis - restrictions during jaw movement, 7%). Control group: 100 patients (64 W, 36 M, mean age = 36 y).
Gesch, 2004[18] (Germany)	Cross-sectional observational	No mention to DC or RDC/TMD exam[†]	4289 patients (2180 W, 2109 M).
Bernhardt, 2005[19] (Germany)	Population-based cross-sectional	No mention if DC or RDC/TMD exam[†]	4255 subjects (2165 W, 2090 M).
Mundt, 2005[20] (Germany)	Population-based, randomized, cross sectional	No mention if DC or RDC/TMD exam[†]	2963 subjects (1493 W, 1470 M).
Casanova-Rosado, 2006[21] (Mexico)	Cross-sectional	RDC/TMD	506 patients (274 W, 232 M, mean age = 17.2 ± 2.7 y)
Selaimen, 2007[22] (Brazil)	Analytical, case-control	RDC/TMD	72 patients (all women, mean age = 32.4 ± 12.1 y), diagnosed with myofascial pain, with or without limited opening and arthralgia. **Control group**: 30 patients (all women, mean age = 38.7 ± 14.4 y).
Ommerborn, 2008[23] (Germany)	Prospective observational clinical	RDC/TMD	125 patients (80 W, 45 M, mean age = 49.24 ± 15.73 y)
Quinteromarmol-Juárez, 2008[24] (Mexico)	Comparative cross-sectional	RDC/TMD	130 patients (70 W, 51 M, mean age = 34 ± 10 years), with or without TMD.
Slade, 2011[25] (USA)	Case-control	RDC/TMD	185 patients (155W, 30M) with chronic TMD **Control group**: 1633 pain-free volunteers (925W, 708M).
Reissmann, 2012[26] (Germany)	Case-control	RDC/TMD	70 patients (57 W, 13 M, mean age = 41.9 ± 15.6 y), with at least one pain-related diagnosis **Control group**: 868 subjects (493 W, 375 M, mean age = 40.4 ± 11.8 y) - general-population adults without any pain-related TMD.
Blanco-Hungría, 2012[27] (Spain)	Cross-sectional	RDC/TMD	748 patients (624 W, 124 M, mean age = 53.28 ± 27.76 y) with some of the following signs or symptoms: mandibular or TMJ pain, limitation or restriction during oral aperture or lateralization, or joint sounds with or without pain.
Slade, 2013[5] (USA)	Community-based prospective cohort	RDC/TMD	2737 participants (1630 W, 1107 M) without history of TMD.
Blanco-Aguilera, 2014[28] (Spain)	Cross-sectional epidemiological	RDC/TMD	407 patients (365 W, 42 M) with at least one of signs and symptoms as: pain in the jaw or TMJs, restricted or limited range of motion when opening or closing the mouth or lateral excursions of the jaw, and joint sounds (with or without pain).
Lei, 2015[29] (China)	Cohort	RDC/TMD	510 patients (387 W, 123 M, mean age = 31.06 ± 14.40 y) with TMD.

(*Continued*)

Table 1 (Continued).

Study First Author, Year	Study Design	Diagnostic Criteria	Population
Dahan, 2016[30] (Canada)	Comparative cross-sectional, multicenter	RDC/TMD	180 patients (149 W, 31 M, mean age = 42.8 ± 1.2 y), with chronic TMD.
Su, 2017[31] (Netherlands)	Cross-sectional	DC/TMD	320 patients with TMD (250 W, 70 M, mean age = 43.2 ± 14.6 years).
Di Paolo, 2017[32] (Italy)	Retrospective cohort	DC/TMD	929 patients with TMD.
Santiago, 2019[33] (USA)	Case-control	RDC/TMD	124 patients (all women, mean age = 40.3 ± 14.9 y) with **Myofascial** TMD (27.4% with muscle pain only – n = 34, 72.6% with muscle and joint pain – n = 90).
Miller, 2019[34] (USA)	Cross-sectional Multicenter study Ω	RDC/TMD	846 participants with chronic TMD (652 W, 194 M, mean age = 29.0 ± 7.8 years) aged 18–44 years.
Balik, 2019[35] (Turkey)	Cross-sectional	RDC/TMD	104 patients (64 W, 40 M, mean age = 33.46 ± 10.51 y) with chronic TMD pain for at least 6 months.
Arikan, 2019[36] (Turkey)	Cross-sectional	RDC/TMD	77 patients with TMD (59 W, 18 M, mean age = 32.69 ± 13.64 years).
Resende, 2020[37] (Brazil)	Nonpaired, controlled case	RDC/TMD	120 patients (80 W, 40 M, mean age = 33.29 ± 13.68 years) with and without TMD.
de Caxias, 2021[38] (Brazil)	Epidemiological cross-sectional and analytic	DC/TMD	2301 patients (1513 W, 537 M, 2 Non-binary, mean age = 41.4 ± 13.64 y), practicing social isolation during the COVID-19 pandemic. 249 patients (150W, 99M), not practicing social isolation during COVID-19 pandemic.
Delgado-Delgado, 2021[39] (Spain)	Observational	DC/TMD	59 participants with (n = 45) and without (n = 14) TMD (35 F, 24 M, mean age = 28.0 ± 10.1 years).
Tavares, 2021[40] (Brazil)	Cross-sectional cohort cut	RDC/TMD	15 patients (5 W, 10 M, mean age = 69.0 years), elderly people with Parkinson's disease associated with TMD and depression.
Lei, 2021[41] (China)	Cross-sectional	DC/TMD	1079 patients (856 W, 223 M, mean age = 29.6 ± 14.2 y) with TMD.
Mendonça, 2022[42] (Brazil)	Cross-sectional	RDC/TMD	41 patients (all women, mean age = 26.83 ± 7.54 y), diagnosed with at least one painful TMD, who presented for treatment before and during COVID-19 pandemic.

Notes: [†]Followed the guidelines of the Academy of Orofacial Pain. [Ω]University of Buffalo, NY; University of Florida Gainesville, FL; University of Maryland in Baltimore, MD; and University of North Carolina at Chapel Hill, NC.

the results of the 27 papers retrieved differed substantially in most aspects. Nevertheless, it was possible to summarize the findings according to the frequency of reported results (Table 2).

In general, no statistically significant difference was reported by the included studies between men and women regarding sociodemographic factors. The differences found were that women demonstrated higher prevalence of TMDs and pain-related impairments. Only one study reported that men were more likely to have higher pain-related disability than women.[31]

Diagnosed TMDs were higher among younger individuals, while those aged above 50 years showed a lower prevalence. Conversely, the prevalence of non-painful TMDs was also higher in the 20–30 years old individuals, while older individuals were more likely to experience high-impact pain.

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Table 2 Summary of the Findings from the Included Studies (PECO)

Study First Author, Year	Exposure (Sociodemographic Factors)	Comparisons	Outcomes
Velly, 2002[17] (Canada)	**Age categories** (years) 18–27: n = 23 28–37: n = 18 38–45: n = 5 46–60: n = 13 **Race** Non-white: n = 10 White: n = 49 **Education** Less than University: n = 30 University: n = 29 **Job** Household: n = 4 Employed: n = 37 Not employed: n = 18 **Household income** (Can$/year) < 30,000: n = 29 30,000–60,000: n = 17 > 60,000: n = 8 Non-reported: n = 5 **Marital status** Married: n = 22 No partner (single, divorced, widowed): n = 36	**Age categories** (years) 18–27: n = 25 28–37: n = 24 38–45: n = 25 46–60: n = 26 **Race** on-white: n = 123 White: n = 77 **Education** Less than University: n = 57 University: n = 43 **Job** Household: n = 10 Employed: n = 55 Not employed: n = 18 **Household income** (Can$/year) < 30,000: n = 55 30,000–60,000: n = 30 > 60,000: n = 7 Non-reported: n = 8 **Marital status** Married: n = 55 No partner (single, divorced, widowed): n = 44	- Gender was not associated with Disc Displacement (DD). - Age levels from 28 to 37 (OR = 0.84; 95% CI: 0.37–1.88), from 38 to 45 (OR = 0.25; 95% CI: 0.07–1.10), and greater than 46 (OR = 0.56; 95% CI: 0.23–1.30) were not associated with DD. - Race, education, and household income were not related to DD.
Gesch, 2004[18] (Germany)	**Age** (years) 20–30: n = 592 30–40: n = 760 40–50: n = 748 50–60: n = 789 60–70: n = 789 > 70: n = 611 **Race -** Not reported **Education** Less than University: n = 3586 University: n = 703 **Job -** Not reported **Household income** (US$) < 875 (lower): n = 939 875–2000: n = 2453 > 2000: n = 897 **Marital status -** Not reported	No comparison group.	- Women (OR = 2.3) compared with men, or subjects aged 30 to 40 years (OR = 1.6) or 40 to 50 years (OR = 1.4), compared with the age group of 20 to 30 years displayed more than one clinical sign of TMD. - Higher education was associated with more TMD signs (OR = 1.4). - Associations between age or sex and TMD were found. Being woman was a clinically relevant sociodemographic risk marker regarding TMD signs (OR = 2.3).

Bernhardt, 2005[19] (Germany)	**Age categories** (years) 20–29: n = 591 30–39: n = 758 40–49: n = 747 50–59: n = 787 60–69: n = 789 70–79: n = 583 **Race -** Not reported **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	**Participants with Headache (287W, 98M)** **Age categories** (years) 20–29: n = 57 30–39: n = 76 40–49: n = 90 50–59: n = 74 60–69: n = 56 70–79: n = 32 **Race -** Not reported **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	- Women had a significantly higher risk for developing frequent headache compared to men. - Being 50 years and older showed a decreased risk of suffering from frequent headache. - Women showed a clear dose/response effect for one to three painful muscles (OR = 2.10) and for four or more (OR = 3.47) painful muscles. - Of the entire sample, 1.3% reported pain in the masticatory muscles, which was significantly correlated with frequent headache in women (OR = 2.37). - Pain upon palpation of the TMJ was only related to headache in women upon lateral palpation.
Mundt, 2005[20] (Germany)	**Presence of Pain** **Muscle Tenderness and/or Pain** **(n = 416, 276W, 140M)** **Age categories** (years) 35–44: n = 72W; 35M 45–54: n = 54W; 20M 55–64: n = 91W; 39M 65–74: n = 56W; 46M **Race -** Not reported **Education** Less than University: n = 138W; 74M University: n = 138W; 66M **Job -** Not reported **Income -** Not reported **Marital status** Married: n = 189W; 109M No partner (single, divorced or widowed): n = 87W; 31M **TMJ Tenderness and/or Pain** **(n = 159, 109W, 50M)** **Age categories** (years) 35–44: n = 30W; 15M 45–54: n = 28W; 11M 55–64: n = 34W; 14M 65–74: n = 17W; 10M **Race -** Not reported **Education** Less than University: n = 48FW 22M University: n = 61W; 28M **Job -** Not reported **Income -** Not reported **Marital status** Married: n = 845W; 1091M No partner (single, divorced or widowed): n = 372W; 239M	**Absence of Pain** **Muscle Tenderness and/or Pain** **(n = 2547, 1217W, 1330M)** **Age categories** (years) 35–44: n = 317W; 323M 45–54: n = 341W; 318M 55–64: n = 326W; 366M 65–74: n = 233W; 329M **Race -** Not reported **Education** Less than University: n = 526W; 617M University: n = 691W; 713M **Job -** Not reported **Income -** Not reported **Marital status** Married: n = 845W; 1091M No partner (single, divorced or widowed): n = 372W; 239M **TMJ Tenderness and/or Pain** **(n = 2804, 1384W, 1420M)** **Age categories** (years) 35–44: n = 359W; 343M 45–54: n = 370W; 327M 55–64: n = 383W 391M 65–74: n = 272W; 359M **Race -** Not reported **Education** Less than University: n = 616W; 669M University: n = 768W; 751M **Job -** Not reported **Income -** Not reported **Marital status** Married: n = 71W; 43M No partner (single, divorced or widowed): n = 38W; 7M	- Lower muscle tenderness was observed in men aged 45 to 54 years compared to other age groups ($P = 0.062$). - For both TMD signs, the differences in proportions of other age groups were not significant according to bivariate tests. - Individuals with school education of up to 9 years were more likely to have muscle tenderness or pain (men, $P = 0.024$). - Women who bruxed also showed a significant difference in muscle tenderness (25.2% vs 35.1%, $P = 0.001$). - Sociodemographic data – such as age, marital status, and school education modified the observed effects.

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Table 2 (Continued).

Study First Author, Year	Exposure (Sociodemographic Factors)	Comparisons	Outcomes
Casanova-Rosado, 2006[21] (Mexico)	**Age categories** (years) Females: mean age = 17.35 ± 2.67 Males: mean age = 17.05 ± 2.71 **Race -** Not reported **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	No comparison group.	- TMD prevalence = 46.1% (n = 233). - Women have higher prevalence of TMD (52.9 vs 37.9%) than men ($P < 0.01$), and more likely to have TMD than men (OR = 1.8). - The mean age was higher within the group with TMD (17.6 ± 2.9 vs 16.9 ± 2.5) than those without TMD ($P < 0.01$). - Pain diagnosis was associated with age (OR = 1.2; 95% CI = 1.1–1.3) and female sex (OR = 2.3; 95% CI = 1.2–4.5).
Selaimen, 2007[22] (Brazil)	**Age categories -** Not reported **Race -** Not reported **Education** Less than University: n = 61 University: n = 11 **Job** Employed: n = 25 Unemployed: n = 47 **Household income** Up to 5 minimum wage: n = 45 > 5 minimum wage: n = 27 **Marital status** Married: n = 43 No partner (single, divorced or widowed): n = 29	**Age categories -** Not reported **Race -** Not reported **Education** Less than University: n = 23 University: n = 7 **Job** Employed: n = 21 Unemployed: n = 9 **Household income** Up to 5 minimum wage: n = 22 > 5 minimum wage: n = 8 **Marital status** Married: n = 20 No partner (single, divorced or widowed): n = 10	- Unemployment and age did show statistically significant differences between TMD patients and non-pain subjects.
Ommerborn, 2008[23] (Germany)	**TMD patients (n = 60, 49W, 11M, mean age = 43.45 ± 14.01 y)** **Age categories -** Not reported **Race -** Not reported **Education** Less than University: n = 39 University: n = 21 **Job** Employed: n = 43.3% Unemployed: n = 48.4% Retired: n = 8.3% **Household income -** Not reported **Marital status** Married: n = 34 No partner (single, divorced, widowed): n = 26	**Non-TMD participants (n = 65, 31W, 34M, mean age = 53.03 ± 14.09 y)** **Age categories -** Not reported **Race -** Not reported **Education** Less than University: n = 48 University: n = 17 **Job** Employed: n = 20% Unemployed: n = 49.2% Retired: n = 30.8% **Household income -** Not reported **Marital status** Married: n = 42 No partner (single, divorced, widowed): n = 23	- Statistically significant differences were found with respect to age and gender. - Education and marital status showed no significant differences between both groups.

Quinteromarmol-Juárez, 2008[24] (Mexico)	**With TMD (n = 65, 48W, 17M)** **Age categories -** Not reported **Race -** Not reported **Education** (years) - 14.00 ± 3.60 **Job -** Not reported **Household income** (Mex$) Average: 5178.00 ± 4786.00 **Marital status** Married: n = 45 No partner (single, divorced, widowed): n = 20	**Without TMD (n = 65, 37W, 28M)** **Age categories -** Not reported **Race -** Not reported **Education** (years) - 14.10 ± 3.30 **Job -** Not reported **Household income** (Mex$) Average: 4546.00 ± 4257.00 **Marital status** Married: n = 43 No partner (single, divorced, widowed): n = 22	- Statistically significant differences were found when comparing by sex ($P < 0.04$). - The statistical data showed that there was no difference between demographic data (age, years of study and income) and TMD.
Slade, 2011[25] (USA)	**Age categories** (years) 18–24: n = 72 25–34: n = 60 35–44: n = 53 **Race** White (non-hispanic): n = 145 Non-whites: n = 40 **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	**Age categories** (years) 18–24: n = 838 25–34: n = 451 35–44: n = 344 **Race** White (non-hispanic): n = 839 Non-whites: n = 794 **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	Odds of TMD increased across successively older age groups. - Women had more than three times the odds of TMD as males. - Relative to non-Hispanic Whites, other racial groups had lower odds of TMD (OR = 0.2). - Higher educational attainment was associated with greater odds of TMD (OR = 2). - There was a conspicuous lack of association between TMD and income, satisfaction with socioeconomic position, and health insurance coverage.
Reissmann, 2012[26] (Germany)	**Age group -** Not reported **Race -** Not reported **Education** Less than University: n = 46 University: n = 23 **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	**Age group -** Not reported **Race -** Not reported **Education** Less than University: n = 490 University: n = 372 **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	- TMD patients were significantly more often women ($P < 0.001$) and had a lower level of education ($P < 0.05$) than the general population subjects. - No statistically significant differences in age between both groups.

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Table 2 (Continued).

Study First Author, Year	Exposure (Sociodemographic Factors)	Comparisons	Outcomes
Blanco-Hungría, 2012[27] (Spain)	**Age categories** (years) 16–29: n = 151 30–40: n = 176 41–60: n = 142 ≥ 61: n = 279 **Race -** Not reported **Education** Less than University: n = 564 University: n = 184 **Job** Employed: n = 373 Unemployed: n = 369 **Household income** 6000: n = 181 6000–15,000: n = 306 15,000–24,000: n = 211 > 24,000: n = 50 **Marital status** Married: n = 473 No partner (single, divorced or widowed): n = 275	No comparison group.	- The characteristic pain intensity (CPI) score was almost 15 points higher in women than in men (55.73 and 40.91 respectively). - The patients with a lesser educational level yielded higher CPI scores (pain intensity increase of over 5 points), while those with a higher education level yielded comparatively lower pain scores. - Marital status: divorced patients reported higher intensity pain ($P < 0.05$), followed by married subjects. Married or divorced status implied a pain intensity increment of 11.8 and 23.3 points, respectively. - No statistically significant relationship between pain intensity and age group, occupation at the time of the study (employed or otherwise), or income was found.
Slade, 2013[5] (USA)	**Age categories** (years) 18–24: n = 1421 25–34: n = 736 35–44: n = 580 **Race** White: n = 1448 Black/African American: n = 766 Asian: n = 256 Hispanic: n = 178 Other: n = 89 **Education** Less than University: n = 1538 University: n = 1164 Not reported: n = 35 **Job -** Not reported **Household income** (US$) ≤ 20,000/year: n = 421 20,000 – < 40,000: n = 493 40,000 – < 80,000: n = 583 ≥ 80,000: n = 624 Non-reported: n = 616 **Marital status** Married: n = 539 No partner (single, divorced, widowed): n = 2156 Not reported: n = 42	No comparison group.	TMD incidence was positively associated with age, whereas women had only slightly greater incidence than men (hazard ratio = 1.30). Compared to whites, Asians had lower TMD incidence whereas African Americans had greater incidence, although the latter was attenuated somewhat after adjusting for satisfaction with socioeconomic circumstances. - First-onset TMD increased according to age, from 2.5%/year among 18- to 24-year-olds to 4.5%/year among 35- to 44-year-olds. - Marital status was not significantly associated with TMD incidence.

Blanco-Aguilera, 2014[28] (Spain)	**Age** (years) Women mean age: 42.15 ±14.63 Men mean age: 41.48 ± 17.28 **Age group** (years) 16–29: n = 98 30–40: n = 106 41–60: n = 154 ≥ 61: n = 49 **Race -** Not reported **Education** (years) - Not reported **Job -** Not reported **Household income -** Not reported **Marital status** Married: n = 216 No partner (single, divorced, widowed): n = 186 Not reported: n = 5	No comparison group.	Significant association for gender, age, marital status, and pain duration.
Lei, 2015[29] (China)	**Myofascial Pain (n = 128, 103W, 25M)** **Age** (years) - 33.59 ± 15.30 **Race -** Not reported **Education** Less than University: n = 51 University: n = 77 **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	**Non-myofascial Pain (n = 382, 284W, 98M)** **Age** (years) - 30.22 ± 13.99 **Race -** Not reported **Education** Less than University: n = 251 University: n = 131 **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	The myofascial pain group had the average age significantly higher than those of non-myofascial pain group. - No significant difference in sex distribution was observed between the two groups.
Dahan, 2016[30] (Canada)	**Myofascial TMD (n = 121, 102W, 19M)** **Age** (years) - 42.5 ± 1.4 **Race -** Not reported **Education -** Not reported **Job** Part-time employed: n = 21 Full-time employed: n = 64 Unemployed: n = 25 Retired (on disability): n = 11 **Household income -** Not reported **Marital status** Married: n = 55 No partner (single, divorced, widowed): n = 66	**Non-myofascial TMD (n = 59, 47F, 12M)** **Age** (years) - 43.4 ± 2.1 **Race** - Not reported **Education -** Not reported **Job** Part-time employed: n = 11 Full-time employed: n = 28 Unemployed: n = 19 Retired (on disability): n = 1 **Household income -** Not reported **Marital status** Married: n = 37 No partner (single, divorced, widowed): n = 22	- No sociodemographic differences were observed between the myofascial TMD (m-TMD) and non-myofascial TMD (n-TMD) groups.

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Table 2 (Continued).

Study First Author, Year	Exposure (Sociodemographic Factors)	Comparisons	Outcomes
Su, 2017[31] (Netherlands)	**Age** (years) Female mean age: 43.4 ± 14.5 Male mean age: 42.1 ± 15.2 **Race -** Not reported **Education** (years) - Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	No comparison group.	- Higher pain intensity tended to be associated with younger age. - Women were more likely to have higher pain intensity than men. - Men were more likely to have higher pain-related disability than females and age was not associated with pain-related disability.
Di Paolo, 2017[32] (Italy)	**Headache (n = 625)** **Age categories** (years) ≤ 15: n = 10 16–25: n = 142 26–40: n = 182 41–50: n = 166 51–60: n = 72 61–70: n = 37 > 70: n = 6 **Race -** Not reported **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	**Without Headache (n = 304)** **Age categories** (years) ≤ 15: n = 1 16–25: n = 73 26–40: n = 53 41–50: n = 45 51–60: n = 69 61–70: n = 51 > 70: n = 12 **Race -** Not reported **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	- Sociodemographic factors did not show a statistically significant correlation in either group. - In the Headache group, the age classes most frequently involved were 26–40 (n = 182) and 41–50 (n = 166).
Santiago, 2019[33] (USA)	**Age** (years) TMD muscle pain: 40.3 ± 15.5 TMD muscle + joint pain: 40.3 ± 14.7 **Race** Hispanic: TMD muscle pain: n = 5 TMD muscle + joint pain: n = 22 **Education** (years) TMD muscle pain: mean study time: 15.4 ± 2.3, n = 34 TMD muscle + joint pain: mean study time: 15.5 ± 2.3, n = 88 **Job -** Not reported **Household income** (US$) > 15,000: TMD muscle pain: n = 24 TMD muscle + joint pain: n = 65 **Marital status -** Not reported	**Control group (n = 46, all women)** **Age** (years) - 36.1 ± 13.5 **Race -** Hispanic: n = 9 **Education** (years) - 15.7 ± 2.3 **Job -** Not reported **Household income** (US$) >15,000: n = 32 **Marital status -** Not reported	- No significant differences were found between muscle pain and muscle + joint pain groups on demographic variables or comorbid fibromyalgia.

Miller, 2019[34] (USA)	**Low Impact Pain, n = 563 (437 W, 126 M)** **Age categories** (years) 18–24: n = 229 25–34: n = 205 35–44: n = 129 **Race** White: n = 429 Black/African American: n = 49 Asian: 29 Hispanic: 38 Other: 18 **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported **Study site** University of North Carolina: n = 177 University of Buffalo: n = 122 University of Florida: n = 173 University of Maryland: n = 91	**High Impact Pain, n = 283 (215 W, 68 M)** **Age categories** (years) 18–24: n = 85 25–34: n = 100 35–44: n = 98 **Race** White: n = 175 Black/African American: n = 71 Asian: 9 Hispanic: 18 Other: 10 **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported **Study site** University of North Carolina: n = 62 University of Buffalo: n = 79 University of Florida: n = 64 University of Maryland: n = 78	- Older people were more likely to experience high-impact pain. - Sex distribution by impact was very similar. There were more women than men in the sample of cases, with the 3:1 female to male ratio observed in both low- and high-impact groups. - Gender had no effect on pain impact. - Black/African American people were more likely to experience high-impact pain compared to other racial/ethnic categories and had 3.5 times the odds of having high-impact pain compared to whites (AUC = 0.34, 95% CI (2.4, 5.2)). - Black/African American people were older than participants from other racial groups. - People identified as Asian, Hispanic, other or multiple racial/ethnic groups **did not** have elevated estimates of high-impact pain.
Balik, 2019[35] (Turkey)	**Age categories -** Not reported **Race -** Not reported **Education** (years) ≤ 8: n = 50 > 9: n = 54 **Job** Employed (full or part-time): n = 57 Unemployed: n = 47 **Household income -** Not reported **Marital status** Married: n = 51 No partner (single, divorced or widowed): n = 53	No comparison group.	Significant differences were found in the functional limitation subscale in terms of educational level ($P = 0.036$), and employment status ($P = 0.042$). - There were no differences found in the physical and mental component summary scores and its subscales in terms of socio-demographic variables. - Weak correlations were found in age/role limitations related to emotional problems ($r = -0.203$, $P < 0.05$); age/vitality ($r = -0.243$, $P < 0.05$); age/social functioning ($r = -0.229$, $P < 0.05$). - Lower educational level (Odds Ratio = 0.08, 95% Confidence Interval = 0.01 to 0.56), was found to be one of the most important predictors for higher pain-related disability.

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Table 2 (Continued).

Study First Author, Year	Exposure (Sociodemographic Factors)	Comparisons	Outcomes
Arikan, 2019[36] (Turkey)	**Age** (years) Muscle disorders, mean age: 25.52 ± 7.61 (16W, 9M) Disc Displacement, mean age: 24.59 ± 7.82 (21W, 6M) Other common diseases, mean age: 48.6 ± 8.62 (22W, 3M) **Height** (cm) Muscle disorders: 167.96 ± 10.29 Disc Displacement: 165.52 ± 6.9 Other common diseases: 165.13 ± 8.92 **Weight** (kg) Muscle disorders: 65.44 ± 12.57 Disc Displacement: 65.26 ± 13.69 Other common diseases: 70.36 ± 12.92 **Body Mass Index** (kg/m^2) Muscle disorders: 23.18 ± 3.69 Disc Displacement: 23.66 ± 4.05 Other common diseases: 25.77 ± 4.33 **Race -** Not reported **Education** (years) - Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	No comparison group.	Mean age of the Other common diseases group were significantly higher than the ones in Muscle disorders and Disc displacement groups ($P < 0.001$). Higher the age, increase the expectation of osteoarthritis and osteoarthrosis. - There was no difference among the three groups in weight, height and body mass index (BMI).
Resende, 2020[37] (Brazil)	**TMD, n = 60 (48W, 12M)** **Age categories -** Not reported **Race -** Not reported **Education -** Not reported **Job** Employed: n = 20 Unemployed: n = 39 **Household income -** Not reported **Marital status** Married: n = 30 No partner (single, divorced or widowed): n = 28	**Without TMD, n = 60 (32W, 28M)** **Age categories -** Not reported **Race -** Not reported **Education -** Not reported **Job** Employed: n = 8 Unemployed: n = 52 **Household income -** Not reported **Marital status** Married: n = 45 No partner (single, divorced or widowed): n = 15	Among patients with TMD, 60% were women ($P = 0.002$), 65.1% were single ($P = 0.009$), and 71.4% were employed ($P = 0.008$). - Sociodemographic data showed an association with TMD: being woman (OR = 3.5), being employed (OR = 3.3; $P = 0.008$), and do not have partner (OR = 2.8; $P = 0.009$).

de Caxias, 2021[38] (Brazil)	**Practice of social isolation** **Age categories -** Not reported **Race -** Not reported **Education** Current studying: n = 431 Not studying: n = 1621 **Job** Worker: n = 1460 Not employed: n = 592 **Household income -** Not reported **Marital status -** Not reported **Social class** (household gross monthly income – Brazilian currency) A (> 15,760): n = 259 B (> 7880): n = 667 C (> 3152): n = 724 D (> 1576): n = 305 E (< 1576): n = 97	**No Practice of social isolation** **Age categories -** Not reported **Race -** Not reported **Education** Current studying: n = 31 Not studying: n = 318 **Job** Worker: n = 212 Not employed: n = 37 **Household income -** Not reported **Marital status -** Not reported **Social class** (household gross monthly income) A (> R$ 15,760): n = 24 B (> R$ 7880): n = 81 C (> R$ 3152): n = 99 D (> R$ 1576): n = 30 E (< R$ 1576): n = 15	- Gender was associated with "pain/stiffness in the jaw on awakening" (P = 0.037), "change of pain during jaw habits" (P = 0.034) and "perception of change in the situations mentioned in the TMD-Pain Screener" (P = 0.020), "depression" (P = 0.012), "anxiety" (P = 0.006) and "impact of the event" (P = 8.3E-11). No associations were found between "gender" and "presence of pain in the jaw and temporalis" (P = 0.070), "chewing hard food" (question 3.a from the TMD-Pain Screener) (P = 0.735), "opening or moving the jaw" (question 3.b from the TMD-Pain Screener) (P = 0.708), "other jaw activities" (question 3.d from the TMD-Pain Screener) (P = 0.101), nor "presence of pain for three months" (P = 0.102). - Men presented a 28% lesser chance of having pain/stiffness in the jaw on awakening, were 1.34 times more likely to have changes of pain during jaw habits and were 1.23 times more likely to perceive changes of situations mentioned in the TMD-Pain Screener.
Delgado-Delgado, 2021[39] (Spain)	**Age** (years) Women mean age: 27.1 ± 8.9 Men mean age: 29.2 ± 11.6 **Height** (m) Women: 1.63 ± 0.03 Men: 1.80 ± 0.02 **Weight** (kg) Women: 59.4 ± 4.5 Men: 80.7 ± 5.8 **Body Mass Index** (kg/m^2) Women: 22.2 ± 1.2 Men: 24.9 ± 1.6 **Race -** Not reported **Education** (years) - Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	No comparison group.	- TMD was not associated with sociodemographic features. - Earlier age was associated with presence of parafunctional disorders (P < 0.05). Anxiety, a pain predictor, was negatively associated with height and weight (P < 0.05). - Neither awake nor sleep bruxism was associated with none of the variables assessed.

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Table 2 (Continued).

Study First Author, Year	Exposure (Sociodemographic Factors)	Comparisons	Outcomes
Tavares, 2021[40] (Brazil)	**Age group** (years) 60–69: n = 7 70–79: n = 7 ≥ 80: n = 1 **Race** Black: n = 4 White: n = 4 Yellow: n = 1 Brown: n = 5 Other: n = 1 **Education** Less than University: n = 8 University: n = 7 **Job -** Not reported **Household income** < 1 minimum wage: n = 2 1–2 minimum wage: n = 8 3–4 minimum wage: n = 4 5–10 minimum wage: n = 1 >60000 Can$/year: n = 8 Non-reported: n = 5 **Marital status** Married: n = 9 No partner (single, divorced, widowed): n = 6	No comparison group.	- The sociodemographic profile of elderly people who had Parkinson's and associated TMD and depression were of the male sex, married or with a partner, on a low income, with nine or more years of schooling, and moderate stage of the disease.
Lei, 2021[41] (China)	**Painful TMD (n = 519, mean age = 40.0 ± 16.6 y)** **Age categories -** Not reported **Race -** Not reported **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	**Non-painful TMD (n = 560, mean age = 25.9 ± 11.3 y)** **Age categories -** Not reported **Race -** Not reported **Education -** Not reported **Job -** Not reported **Household income -** Not reported **Marital status -** Not reported	- Participants with painful TMDs were often older. - Higher prevalence of nonpainful TMD in younger subjects.

Mendonça, 2022[42] (Brazil)	**Age categories** (years) < 30: n = 27 ≥ 30: n = 14 **Race** White: n = 23 Black: n = 1 Yellow: n = 3 Brown: n = 14 **Education** Less than University: n = 29 University: n = 12 **Job** Employed: n = 24 Unemployed (student): n = 17 **Household income (minimum wage)** < 1: n = 6 1–1.9: n = 5 2–2.9: n = 7 3–5: n = 11 > 6: n = 12 **Marital status** Married: n = 4 No partner (single, divorced or widowed): n = 37	Before and during COVID-19 pandemic. - Same sociodemographic characteristics, changes related to Job (occupation during COVID-19) Unaltered: n = 10 Home-office: n = 6 No occupation: n = 25	- Before pandemic (T1), subject's occupation was associated with OHIP-14 global score, physical pain, and physical disability domains. - During pandemic (T2), age was associated with OHIP-14 global scores, physical pain, psychological discomfort, and psychological disability domains.

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As for race, no significant difference was found in most of the evaluated studies, except for one in which Black/African American people were more likely to experience high-impact pain compared to other racial/ethnic categories.[34] When it comes to education, two articles reported that higher educational level, could be a risk factor for TMDs, because it may be associated with having more stressful jobs.[18,25] Conversely, three studies demonstrated that a lower level of education, was associated with a higher pain degree.[20,27,35] Further, being employed or not, in general, was not a risk factor for TMDs.

Considering the marital status, no difference was usually found, but when reported it was considered that divorced individuals reported higher intensity pain ($p<0.05$), followed by married ones.

Discussion

The influence of sociodemographic factors on the development, presentation, and treatment outcomes of chronic painful conditions is widely acknowledged.[43–45] Understanding these factors can inform the creation of tailored prevention programs and personalized treatment methods, ultimately enhancing patient outcomes and improving the quality of life for individuals with TMDs. This scoping review highlights age, gender, marital status, education level, and profession as the most frequently studied sociodemographic factors.

Age was investigated in every study in this review. While TMDs can manifest in any age group, research indicates that the incidence rises during adolescence and young adulthood, peaking between 20 and 40 years of age. This heightened prevalence may be linked to hormonal fluctuations, psychosocial stress, and an increased vulnerability to injury or trauma during this life stage.[8,46–48] With aging, structural changes occur in the joints and surrounding tissues. Wear on joint cartilage, bone remodeling, and tissue degeneration can impact the function and stability of the TMJ, potentially contributing to TMDs such as disc displacement, as noted in Velly et al case–control study.[17,49–51]

Similar to age, gender was a focal point across all studies in this review. Extensive evidence highlights gender disparities in the prevalence of TMDs, with women exhibiting a higher prevalence compared to men in diverse populations and geographic regions (Table 1). Women tend to perceive oral health, particularly orofacial pain, more negatively than men.[28] This gender bias is influenced by hormonal factors, anatomical variations in the TMJ and muscles, psychosocial factors, and differences in pain reporting and mechanisms.[31,52–54] A comprehensive understanding of gender-specific aspects in TMDs can contribute to the development of personalized treatment strategies and targeted interventions to enhance TMDs management.

Marital status was investigated in only 14 studies included in this review. Unlike other health conditions, such as coronary diseases, where the impact of marital status is well documented, the consideration of this factor in the realm of TMDs remains limited. Research in coronary diseases shows that a satisfying marital relationship reduces biological, lifestyle, and psychosocial risk factors associated with disease development.[55] However, in the context of TMDs, only a few studies have explored this variable. The current findings indicate that individuals who are divorced, separated, or widowed exhibit a higher prevalence of TMDs compared to those who are married or single. This association may stem from the psychosocial ramifications of relationship dissolution.[20,37]

In general, a patient's level of education is a significant factor, as higher education tends to correlate with greater self-care and motivation to seek specialized help for addressing pathologies, particularly painful ones.[56] The current review reveals that studies examining educational levels indicate that individuals with lower academic degrees or fewer years of education may face an elevated risk of developing TMDs and experiencing more severe symptoms. Health behaviors, psychosocial factors, pain perception, and treatment adherence are all potential mediators in the relationship between educational level and TMDs.[19,26,27,35]

The link between a patient's profession and TMDs has been a focal point in research investigating occupational factors and their potential influence on TMDs prevalence, risk factors, and symptomatology. In this review, numerous studies have shed light on the correlation between profession and TMDs. Various occupational factors have been identified as potential risk factors for the development of TMDs, with variations based on the nature of the profession. Specific professions have been highlighted as potentially having a higher prevalence of TMDs or increased risk factors. These include occupations involving prolonged or repetitive use of the masticatory system, such as playing musical instruments or professions requiring extensive speaking or voice use. Furthermore, professions characterized by high levels of stress, such as teaching, computer office work, healthcare, military service, and emergency services, may also exhibit an increased risk of TMDs.[57–61]

In this sociodemographic study segment, parallels can be drawn with other chronic painful conditions, revealing striking similarities. For example, both fibromyalgia and chronic migraine conditions tend to disproportionately affect young women with lower levels of education, thus adversely impacting their personal relationships.[62–64] These shared patient profile similarities also indicate that individuals with TMD could potentially benefit from successful treatment strategies like those used for other conditions, and vice versa.

Finally, all results must be interpreted cautiously due to the methodological limitations of the review. While systematic reviews are considered the highest level of scientific evidence, the wide variability in objectives and methodologies of the included studies made it infeasible in this case. Hence, the decision to conduct a scoping review was based on its capacity to map and provide an overview of the research field, allowing for a flexible analysis of the addressed studies. Moving forward, when there are scientific articles with relevant methodology, a systematic review on the subject should also be conducted. Furthermore, we strongly recommend that future clinical studies on individuals with TMDs include data collection on the not commonly reported sociodemographic factors such as education, job, income, and marital status. By doing that it will allow to explore the actual relationship of sociodemographic factors, especially for individuals with painful TMDs. As a final remark, the results of this review aimed to contribute to the understanding of the influence of various sociodemographic factors on TMD occurrence, but were also an attempt to characterize the individuals suffering from TMD. In addition, by characterizing the individuals with TMD regarding their sociodemographic variables, their psychosocial variables and correlate them to TMDs, especially painful TMDs, might provide clinicians with tools and categorizations that will help them setting up individualized treatment plans based on their condition but also based on sociodemographic and psychosocial factors and variables affecting and causing the condition. That would in turn improve treatment outcome and prognosis, while it will reduce individual pain and suffering.

Conclusion

Given the conflicting results of the included studies on TMD individuals sociodemographic profiles, it can be inferred that young women with lower educational levels and without a partner were the most susceptible to experiencing TMD signs and symptoms.

Data Sharing Statement

Datasets related to this article will be available upon request to the corresponding author.

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The authors declare no conflicts of interest in this work.

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