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Dental Health, Caries Perception and Sense of Discrimination among Migrants and Refugees in Europe: Results from the Mig-HealthCare Project

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Featured Application: Strategic planning of diet and dental caries reduction programs in asylum settings for migrants and refugees.

Abstract: Dental and oral health are considered among the main health issues for migrants and refugees, as access to dental health care services is often expensive and difficult. The study investigates dental and oral health determinants among migrants and refugees in 10 European countries (Austria, Bulgaria, Cyprus, France, Germany, Greece, Italy, Malta, Spain, and Sweden), examining how mental health, legal status, discrimination issues and dental services' use frequency affect dental health. Methods: A cross sectional study using a purpose-made questionnaire was carried out to assess health status and access, with a dedicated section to measure self-perceived dental health, prevalence of caries, last visit to dentist and anticipated access to dental health services. Multivariable logistic regression models were performed to investigate the impact of quality of life, discrimination, immigration status, and other demographic factors on dental health. Results: About half of the sample suffered from poor dental condition and 22% had never visited a dentist. Migrants with higher educational levels had higher odds of having good dental health (OR = 1.08; 95%CI (1.03, 1.12)) and brushing their teeth daily (OR = 1.1; 95%CI (1.04, 1.17)). Higher general and mental health scores were indicative of better dental condition (general health: OR = 1.02; 95%CI (1.01, 1.03); mental health: OR = 1.01; 95%CI (1.004, 1.02)) and higher probability of daily teeth brushing (general health: OR = 1.02; 95%CI (1.01, 1.03); mental health: OR = 1.02; 95%CI (1.01, 1.03)). The possession of any kind of legal immigration permission and not having any children showed similar results. Age and discrimination were correlated with decreased likelihood for good dental conditions. Gender was correlated with daily teeth brushing, as female migrants had higher odds of brushing their teeth daily. Conclusions: Many migrants report poor dental health. Nonetheless, migrants with higher education levels, legal immigration status, better general and mental health, no children, lower sense of discrimination, younger age, and regular dental visits were positively correlated to good dental health (perceived as no dental caries).

Keywords: dental caries; diet; food habits; dental health policy; minority groups; vulnerable populations; migrants; refugees; self-rated oral health; Mid-HealthCare project

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1. Introduction

Peaking in 2015 and known since as the European refugee crisis, millions of refugees have fled from persecution and war-torn countries to the European continent [1–3]. Refugee flows have been continuous and although the COVID-19 pandemic corresponded to a decrease in arrivals initially, in the beginning of August 2021, arrival numbers once again surged. By the end of 2021, a total of about 10,000 migrants had arrived in Europe in a period of nine months [3]. The war in the Ukraine in the beginning of February 2022, also created an unexpected increase in migrant numbers. One month later, the European Union (EU) faced its most significant refugee crisis since World War II, with more than 10 million people fleeing their homes, 6.5 million displaced within Ukraine and 3.9 million escaping to neighboring countries [4].

Many refugees who have arrived in Europe since 2015 have struggled obtaining asylum or other forms of legal permission [5,6]. Consequently, immigration status insecurity often leads to discrimination [7] and affects access to healthcare services [7–10]. Most of the time, migrants lack pre-departure orientation, the so-called cultural orientation, to help them with a smooth transition [11]. As a result, migrants often face food and housing issues [12,13]. Oral health is a complex process influenced by multiple and interrelated factors. A multitude of factors related to country of origin, urban/rural residence, socio-economic and cultural factors, educational level, racism, sexism, discrimination issues and economic situation in the host country affect oral health outcomes [14–16]. In addition, dietary patterns have shown to negatively affect oral health. For example, studies in elderly populations have shown that diet and oral health coaching can empower the prevention and management of oral diseases and can improve the level of oral health [17,18]. Because of the high cost of dental services, migrants are often in high need of oral health care services and are at a disadvantage when it comes to accessing these services [11,12]. A literature search on the oral health status of migrants related to quality of life (OHRQoL) revealed the dual result of both better and worse dental and overall oral health in migrants as compared to the host populations [19]. Other research has shown definitive negative results that oral health status of recently arrived migrants is inadequate and can pose challenges to the national healthcare system, especially for those without asylum or a permit to stay [11,12,14]. Given that migrants often face limited financial resources and knowledge of the country's healthcare system, in conjunction with food and housing insecurity, limited access to dental care services is a common experience [11]. Furthermore, limited access to quality food and dental services engenders extreme vulnerabilities to dental caries and other oral diseases among migrants [11,12,15].

Furthermore, the emotional and socioeconomic burden of forced migration can substantially impact the quality of life of migrants [19–21], and consequently deteriorate their general [22] and dental health status across all age groups [16,19–26]. Access to dentists or dental health providers is crucial for maintaining good dental health. However, because dental health services are often not included under universal health coverage, unique financial barriers affect migrants who often cannot afford the cost of dental services [27,28]. Thus, health care provision for migrants including oral health is becoming a growing concern for policy makers and researchers, as part of the Universal Health Coverage target 3.8 in Goal 3 of the Sustainable Development Goals [29]. In addition, migrants who have not reached their final destination or are stranded in precarious circumstances (camps, temporary settlements) face difficulties in maintaining their oral hygiene and often visit a dentist only when problems are acute or when they are in pain [30]. Finally, there is a lack of language and culturally sensitive information to share with migrants on oral hygiene measures, new products and relevant diet and oral health habits that exist in the host country [31].

Mig-Healthcare was a 3-year project, co-funded by the European Commission, that aimed to define the elements of best practice to help the health of migrants and refugees at the community level and to develop tools that can assist in this process [30]. On the Mig-Healthcare website (www.mighealthcare.eu, accessed on 9 June 2022) [32], there are tools

and applications, including a step-by-step logical plan, that can support health professionals in delivering quality health care to migrants and refugees. The Mig-HealthCare project identified the main health issues of concern to migrants and refugees, which included dental care, and created outlines of the steps required to maintain good oral hygiene. Included in this information are ways to distinguish different dental issues. This resource has patient-empowering potential as it can lead to quicker, more efficient treatment, as well as preventative potential to reduce dietary-induced dental damage. In general, the Mig-HealthCare project aimed to reduce health inequalities and improve the health care services for migrants and refugees through research and the development of tools to facilitate the implementation of community-based care models for basic diseases, such as dental caries [9].

The present study aims to explore dental and oral health among migrants/refugees in 10 European countries (Austria, Bulgaria, Cyprus, France, Germany, Greece, Italy, Malta, Spain, and Sweden), while also examining how various sociodemographic factors, as well as mental health, immigration, discrimination, and dental service indicators, affect dental health. Implications for policymakers and health professionals are discussed.

2. Materials and Methods

2.1. Design and Sample

For this cross-sectional study, 1407 participants were recruited (N_0 = 1407) using a snowball sampling method, whereby the recruited participants are asked to identify and recruit additional participants. The eligibility criteria for recruitment were as follows: must be at least 18 years of age, have resided in the country of interview for 6 months to 5 years, be able to provide consent and attest to understanding the project goals. Participants were asked to complete a 60-item printed purpose-made questionnaire that assessed demographic and health characteristics. Participation was completely voluntary. The questionnaire was translated by official translators into migrant languages. It was then pilot tested in a sample of 10 migrants per language before the initial launch of the questionnaire to assess its originality and reliability in understanding the questions posed in order to give an answer. The focus of the pilot study was to identify potential unclear or confusing wordings that could lead to possible misunderstandings, as well as to measure the time for the questionnaire's administration. The questionnaire was translated into Arabic, Farsi, Dari, Pashto, Somali (consensus between partners based on the most frequent migrant languages spoken in each country), as well as the languages of the partner countries. In each interview setting, a collaborator from the partner country was present along with an interpreter when necessary. All study interviewers were recruited by each partner and received training on the questionnaire prior to the initiation of data collection. In cases where the study participants were able and chose to communicate in the host country's language, the services of an interpreter were not required. In each setting, a special area ensuring privacy was allocated for questionnaire completion.

Participants were first recruited in the 10 Mig-Healthcare project partner countries from reception centers, primary healthcare units and welfare offices from April 2018 to September 2019. The participating countries included Austria, Bulgaria, the Republic of Cyprus, France, Germany, Greece, Italy, Malta, Spain, and Sweden. However, three countries (France, Germany, and Malta) were excluded from the final sample due to insufficient sample size, resulting in a total of 1294 migrants (N_1 = 1294). Ethical review was provided by the National and Kapodistrian University of Athens, Medical School (No. 1718034664), with additional ethical approvals obtained as needed by partner organizations (University of Valencia, French School of Public Health, University of Uppsala). Data collection took place from April 2018 to September 2019, with no identifiable personal data collected. Each participant was assigned an anonymous identity that was available to the main researchers. Further information about the methodology and other published results from the Mig-HealthCare project are also reported in previous publications [7–9].

2.2. Measures

2.2.1. Questionnaire Development and Description

The study questionnaire comprised 60 questions. These questions were presented in 12 sections, including demographics, household, education and employment, access and interaction with healthcare services, screening, dental care, immunization status and perceptions about health Discrimination.

Sociodemographic Measurements

To better understand the study sample, the following sociodemographic characteristics were collected: age, gender, country of origin, country of interview, education level, marital status, immigration status, parental status and fluency in the language of the country of interview.

Discrimination in Medical Settings (DMS)

Discrimination experienced in medical settings was assessed through the Discrimination Scale in Medical Settings, which is based on the article by Peek et al. (2011) (DMS scale) [33]. DMS assessment was based on answers to the following questions: "when getting healthcare of any kind, have you ever had any of the following things happen to you? 1) you are treated with less courtesy than other people, (2) you are treated with less respect than other people, (3) you receive poorer service than others, (4) a doctor or nurse acts as if they think you are not smart, (5) a doctor or nurse acts as if they are afraid of you, (6) a doctor or nurse acts as if they are better than you, and (7) you feel like a doctor or nurse is not listening to what you were saying." Five answer choices were given with each assigned a numeric score (1 = never, 2 = rarely, 3 = sometimes, 4 = most of the time, and 5 = always). The mean of all seven questions was found to assess perceived discrimination, with scores closer to 5 speaking for higher perceived discrimination. The reliability of the DMS scale was demonstrated by Pearson correlations between the DMS score and its seven component items, which were positive and larger than 0.3, and the diagonal Cronbach's results, which scored more than 0.9.

Mental and General Health

Mental and general health were assessed using the mental and general health scale of the Short Form 36 (SF-36) [34], which has been translated into many languages, including the consortium country languages. The SF-36 is a tool to measure health based on 36 questions and 8 domains. Regarding mental health from SF-36, the following five questions were used with scoring from 0 (low) to 100 (high): "Have you been a very nervous person? Have you felt so down in the dumps that nothing could cheer you up? Have you felt calm and peaceful? Have you felt downhearted and blue? Have you been a happy person?". Answer choices were assigned a numeric score of 1 (all of the time) to 6 (none of the time), which were recoded to values of 0, 20, 40, 60, 80 and 100, respectively. Regarding general health from SF-36, the following five questions were used with scoring from 0 (low) to 100 (high): "In general, would you say your general health is excellent/very good/good/fair/poor, I seem to get sick a little easier than other people, I am as healthy as anybody I know, I expect my health to get worse, My health is excellent". Answer choices were assigned a numeric score of 1 (definitely true/poor), 2 (mostly true/fair), 3 (do not know/good), 4 (mostly false/very good), and 5 (definitely false/excellent), which were recoded to values of 0, 25, 50, 75 and 100, respectively. After inversing the score of some questions, the recoded values were summed, and the mean was taken as the score. The reliability of the general and mental health scale was proven by Pearson correlations between the general health score and its five component items and mental health score and its five component items, which were positive and larger than 0.3 and total Cronbach's was also acceptable in both scales (>0.7).

Dental Healthcare Access and Dental Health Perception

Dental healthcare services access was measured through 4 questions. We asked respondents to choose one of the two following statements: "I know where to go when I need a dentist" and "I don't know where to go when I need a dentist." Dental screening frequency was measured with the question of "last visit to a dentist," and respondents were given the following response options: "Never," ">5 years ago," "2–5 years ago," "1–2 years ago," "<12 months ago," and "Don't remember." Perception of dental health was measured by self-assessment of dental health with the following response options: "Poor," "Fair," "Good," "Very Good," and "Excellent." For subsequent analyses, dental health status was coded into the following two categories: "Good dental condition" and "Not good dental condition." "Good dental condition" incorporated migrants who reported "Excellent," "Very Good," and "Good" perceptions of their dental health, whereas "Not Good dental condition" incorporated respondents with "Poor" and "Fair" dental health perceptions. The following three subsequent statements were presented, followed by a yes or no response: "Brush my teeth every day," "I know where to go when I need a dentist," "I have caries" to assess dental health condition and dental healthcare access.

2.2.2. Statistical Analysis

We performed a descriptive analysis for all questionnaire variables. We then ran multivariable logistic regression models to investigate the impact of sociodemographic parameters, sense of discrimination and presence of any kind of permission on perceived dental health in the migrant population of several EU countries in the framework of the Mig-HealthCare European project. In more detail, we ran two multivariable logistic regression models, one with the dependent variable of the perception of dental health ("Good dental condition" and "Not good dental condition") and the second with frequency of brushing their teeth ("daily" and "not every day"). We inserted mental health, general health, sense of discrimination, presence of any kind of permission and sociodemographic parameters in each model as independent variables to investigate their impact in our dependent variables, each adjusted for the others. We added general and mental health in separate models due to collinearity.

For the data analysis, the statistical package for social sciences (IBM SPSS, Chicago) version 20.0 was used and a p value of ≤ 0.05 was regarded as statistically significant. Statistical tests, such as descriptive, chi-square test, Spearman's correlation, and binomial logistic regression, were used.

3. Results

The demographic characteristics of the sample are presented in Table 1.

Table 1. Characteristics of migrants and refugees, except those from Germany, France and Malta (N = 1294).

Country of Interview	***N* (%)**
Austria	126 (9.74%)
Bulgaria	226 (17.47%)
Cyprus	110 (8.5%)
Greece	255 (19.71%)
Italy	271 (20.94%)
Spain	202 (15.61%)
Sweden	104 (8.04%)
Country of origin	
Afghanistan	187 (14.55%)
Iraq	122 (9.49%)
Nigeria	115 (8.95%)
Syria	281 (21.87%)
Other	580 (45.14%)

Table 1. *Cont.*

Country of Interview	N (%)
Gender (males)	816 (63.26%)
Have at least one child	535 (50.71%)
Marital status	
Single	598 (46.36%)
Engaged/married	581 (45.04%)
Separated	55 (4.26%)
Widowed	56 (4.34%)
Possession of any kind of permission (asylum or other kind)	768 (66.4%)
Age (years) (mean ± SD)	32 ± 11
Educational level (years) (mean ± SD)	8.9 ± 5.1

Countries of origin included mainly Afghanistan, Iraq, Syria and Nigeria. Countries clustered under 'other' included Iran, Venezuela, Somalia, Gambia and other North African countries.

Dental health and frequency of dental health screening are presented in Table 2. The following statement can be concluded from the results: "A total of 44.4% of the respondents reported their dental health as poor or fair", while one out of four had never visited a dentist (22.13%).

Table 2. Dental health and screening frequency of migrants and refugees, except those from Germany, France and Malta (N = 1294).

Dental/Teeth Condition	N (%)
Poor	212 (16.72%)
Fair	351 (27.68%)
Good	368 (29.02%)
Very good	209 (16.48%)
Excellent	128 (10.09%)
Last visit to a dentist	
Never	279 (22.13%)
>5 years ago	104 (8.25%)
2–5 years ago	148 (11.74%)
1–2 years ago	226 (17.92%)
<12 months ago	352 (27.91%)
Do not remember	152 (12.05%)
Brush my teeth every day (yes)	1135 (90.15%)
I know where to go when I need a dentist (yes)	894 (70.45%)
With caries (bad teeth)	159 (12.29%)

Migrants with good dental condition reported significantly higher educational levels, better general and mental health, lower age, lower sense of discrimination and better access to dentists (Table 3). The possession of any kind of permission to stay and not having any children were also significantly associated with better dental health ($p < 0.05$).

Migrants who brushed their teeth every day reported significantly higher educational levels, better general and mental health and better access to dentists (Table 4). In addition, more migrants from Afghanistan and less from Syria brushed their teeth daily ($p < 0.05$).

Table 3. Descriptive characteristics and other variables by dental/teeth condition.

	Not in Good Dental Condition (*N* = 563)	In Good Dental Condition (*N* = 705)
Years of education (mean ± Standard deviation) **	8.3 ± 4.9	9.4 ± 5.1
General health score (units) **	56.7 ± 24.2	69.7 ± 20.6
Mental health score (units) **	55.7 ± 22	65.3 ± 20
Age (years) (median (interquartile range)) **	32 (25–41)	28 (23–37)
DMS scale (units) **	1.3 (1–2.6)	1 (1–2)
Males (%)	60.4	65.1
Marital status (%) *		
Single	42.0	50.1
Engaged/married	48.8	41.8
Separated	4.6	3.8
Widowed	4.6	4.3
Have at least one child (%) **	59.9	42.7
Possession of any kind of permission (asylum or other kind) (%) *	62.4	69.6
I know where to go when I need a dentist (%) *	67.1	73.1
Country of origin (%) *		
Afghanistan	16.1	13.1
Iraq	7.5	10.1
Nigeria	7.1	10.7
Syria	20.5	22.7
Other	48.8	43.3

* $p < 0.05$; ** $p < 0.001$.

Table 4. Descriptive characteristics and other variables by brushing their teeth.

	Do Not Brush Their Teeth Every Day (*N* = 124)	Brush Their Teeth Every Day (*N* = 1135)
Years of education (mean ± standard deviation) **	6.9 ± 4.8	9.1 ± 5
General health score (units) (mean ± standard deviation) *	57.2 ± 21.8	64.7 ± 23.2
Mental health score (units) *	54 ± 20.2	61.5 ± 21.5
Age (years) (median (interquartile range))	30 (24–39)	29 (23–39)
DMS scale (units)	1 (1–2.4)	1 (1–2)
Males (%)	67.7	62.8
Marital status (%)		
Single	38.2	47.7
Engaged/married	52.7	43.6
Separated	5.7	4.2
Widowed	3.3	4.5
Have at least one child (%)	56.2	49.7
Possession of any kind of permission (asylum or other kind) (%)	72.1	66.0
I know where to go when I need a dentist (%) *	58.2	71.6
Country of origin (%) **		

Table 4. *Cont.*

	Do Not Brush Their Teeth Every Day (*N* = 124)	Brush Their Teeth Every Day (*N* = 1135)
Afghanistan	8.2	14.8
Iraq	9.8	9.0
Nigeria	8.2	9.2
Syria	40.2	20.1
Other	33.6	46.8

* $p < 0.05$; ** $p < 0.001$.

Logistic regression analysis was used to investigate the effect of demographic characteristics, quality of life, sense of discrimination and presence of any kind of permission on dental health (Table 5). Two different logistic regression models, one with general health and one with mental health due to collinearity, were used (Pearson's r = 0.55; $p < 0.001$). Higher educational level indicated significantly higher odds of having good dental conditions in both models (Model 1: OR = 1.072; 95%CI (1.028, 1.118); Model 2: OR = 1.075; 95%CI (1.032, 1.120)). Similar positive correlations to good dental condition were observed for general and mental health, having any kind of permission to stay, and not having any children. Migrants with higher age and DMS score had lower odds of having good dental conditions (for age: Model 1: OR = 0.948; 95%CI (0.928, 0.969); Model 2: OR = 0.947; 95%CI (0.927, 0.968), for DMS score: Model 1: OR = 0.786; 95%CI (0.605, 1.021); Model 2: OR = 0.760; 95%CI (0.586, 0.986)). Widowed migrants had approximately 5 times higher odds of having good dental conditions compared with single migrants (Model 1: OR = 5.338; 95%CI (2.016, 14.136); Model 2: OR = 4.387; 95%CI (1.689, 11.391)). In our sample, migrants who never had visited the dentist reported higher odds of having good dental conditions compared with migrants who had visited the dentist <1 year ago (Model 1: OR = 0.400; 95%CI (0.211, 0.758); Model 2: OR = 0.436; 95%CI (0.231, 0.821)) or had visited the dentist >1 year ago (Model 1: OR = 0.294; 95%CI (0.153, 0.565); Model 2: OR = 0.322; 95%CI (0.169, 0.613)).

Table 5. Logistic regression models that investigated the impact of quality of life, sense of discrimination, presence of any kind of permission and demographics on dental health status (dependent variable).

	Odds Ratio	(95% Confidence Interval)
Model 1		
Education (years)	1.072 ***	(1.028, 1.118)
General health (score)	1.020 ***	(1.010, 1.029)
Age (years)	0.948 ***	(0.928, 0.969)
Discrimination Scale (score)	0.786 *	(0.605, 1.021)
Gender (females)	1.134	(0.732, 1.758)
Marital status [+]		
Engaged/married/living with partner	1.531	(0.892, 2.628)
Separated/divorced	1.531	(0.570, 4.108)
Widowed	5.338 ***	(2.016, 14.136)
No possession of any kind of permission	0.631 **	(0.408, 0.978)
Have no children	1.959 **	(1.221, 3.143)
Last visit to the dentist [++]		
<1 year	0.400 **	(0.211, 0.758)
>1 year	0.294 ***	(0.153, 0.565)
Model 2		
Education (years)	1.075 ***	(1.032, 1.120)
Mental health (score)	1.014 **	(1.004, 1.023)
Age (years)	0.947 ***	(0.927, 0.968)
Discrimination Scale (score)	0.760 **	(0.586, 0.986)

Table 5. *Cont.*

	Odds Ratio	(95% Confidence Interval)
Gender (females)	1.162	(0.752, 1.796)
Marital status[+]		
Engaged/married/living with partner	1.311	(0.763, 2.253)
Separated/divorced	1.521	(0.578, 4.004)
Widowed	4.387 **	(1.689, 11.391)
No possession of any kind of permission	0.648 **	(0.419, 1.001)
Have no children	2.043 **	(1.271, 3.283)
Last visit to the dentist [++]		
<1 year	0.436 **	(0.231, 0.821)
>1 year	0.322 ***	(0.169, 0.613)

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$. [+] compared with single status. [++] compared with never.

Logistic regression was used to investigate the effect of demographic characteristics, quality of life, sense of discrimination, and legal immigration status on the odds of migrants brushing their teeth daily (Table 6). Migrants with higher educational levels and better general and mental health reported significantly higher odds of brushing teeth daily (Model 1, 2). Female migrants had approximately 2.37 times higher odds of brushing their teeth daily, compared with their male counterparts (Model 1: OR = 2.319; 95%CI (1.236, 4.349); Model 2: OR = 2.429; 95%CI (1.265, 4.663)). Migrants from Afghanistan had also significantly higher odds of brushing their teeth daily compared with all migrants, except those from Iraq. Sense of discrimination was not significantly associated with the odds of migrants brushing their teeth daily ($p > 0.1$), and it was omitted from the final models, due to the poorer fit of the models with the DMS score.

Table 6. Logistic regression models that investigated the impact of quality of life, presence of any kind of permission and demographics on migrants brushing their teeth daily (dependent variable).

	Odds Ratio	(95% Confidence Interval)
Model 1		
Education (years)	1.083 **	(1.019, 1.145)
General health (score)	1.017 **	(1.005, 1.030)
Age (years)	1.023	(0.994, 1.054)
Gender (females)	2.319 **	(1.236, 4.349)
No possession of any kind of permission	1.187	(0.637, 2.212)
Country of origin [+]		
Iraq	0.697	(0.120, 4.067)
Nigeria	0.240 **	(0.067, 0.860)
Syria	0.160 **	(0.050, 0.516)
Other	0.406	(0.132, 1.247)
Have at least one child (no)	1.278	(0.710, 2.297)
Model 2		
Education (years)	1.100 **	(1.036, 1.168)
Mental health (score)	1.020 **	(1.007, 1.034)
Age (years)	1.029 *	(0.997, 1.061)
Gender (females)	2.429 **	(1.265, 4.663)
Possession of any kind of permission	1.137	(0.600, 2.155)
Country of origin [+]		
Iraq	0.470	(0.078, 2.829)
Nigeria	0.208 **	(0.055, 0.786)
Syria	0.120 ***	(0.035, 0.418)
Other	0.299 **	(0.094, 0.951)
		(0.816, 2.694)
Have at least one child (no)	1.482	

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$. [+] compared with migrants from Afghanistan.

4. Discussion

This study analyzes data from a questionnaire on self-reported health from migrants and refugees in seven countries in the European Union to assess the effect of sociodemo-

graphic factors, as well as other determinants, that may predict poor self-reported dental health of newly arrived migrants, including discrimination and mental and general health. Of the migrants that comprised the sample, the majority identified as male, designated their country of origin as within the Middle East North Africa (MENA) region, and reported their permission status as legal in their country of interview (i.e., granted asylum). Generally, one out of four migrants had never visited a dentist, while almost half of them reported having poor dental health (a finding corroborated in the literature) [35,36]. Previous studies identified barriers to oral healthcare (affordability, awareness, and accommodation) and focused on cultural sensitivity in diets to form recommendations for improving dental health and access [37,38]. Oral health status is influenced by a complex interrelation of factors, as stressed by Pabbla et al. (2021) [38] and this paper tried to explore different sociodemographic factors, as well as other determinants, that may affect oral healthcare uptake in a specific population with specific vulnerabilities, as reported by the migrants themselves in the context of a large European project.

Our study shows that better self-perceived dental health is mainly associated with younger age, higher educational level, legal immigration permission, better general and mental health, childlessness, lower discrimination sense, and never having visited the dentist. More specifically, young age was proven to be a determinant of poor dental health status (in our study). An increased acceptance of dental health practices of the host country among younger migrant populations compared to their older counterparts has been reported [15]. Adolescents generally demonstrate higher uptake of regular brushing as a preventative measure against dental care visits [39]. In terms of gender, migrant women visited dental health providers more frequently compared to their male counterparts, a finding supported by other studies [38]. It seems that gender plays an important role in the perception of general and oral health, dental visits and daily tooth brushing frequency, as well as in the choice of toothbrush and toothpaste. Female migrants, in comparison to males, take significantly better care of their oral health [40]. Our study also showed that female migrants were more likely to brush their teeth daily compared to male migrants. Furthermore, this study reveals that the level of education is another determinant of dental health and may be explained by the previously identified economic and cultural barriers of language and affordability that affect oral healthcare access. Migrants in our study with significantly higher educational levels brushed their teeth every day and were more informed on oral health hygiene issues, as mentioned elsewhere [41]. Permission status in the host country also affects immigrants' perception of dental health status in our study. Those who were legally permitted to stay in the country had a better overview of the dental services access and were more satisfied with their oral health status than those who had no permission in the host country [42]. General and mental health status also affected self-perception of having good teeth. Those who brushed their teeth every day reported significantly better general and mental health and vice versa, a finding confirmed by the literature [43,44]. Parental status was further expressed as a predictor of oral health perception. The results of our study show that childless adults have a higher perception of their dental health compared with those who had children. The literature provides mixed findings about this phenomenon. Some researchers argue that immigrant parents engage in healthy dental practices to maintain their and their children's dental health, while others argue that parental acculturation is unrelated to their child's dmft/DMFT level [45,46]. Finally, feeling discriminated negatively affected self-perceived good oral health in our study, as confirmed elsewhere [37,47,48].

Migrants who had never visited the dentist reported higher odds of having good dental conditions, compared with migrants who had visited the dentist <1 year ago or had visited the dentist >1 year ago. This is an expected outcome, given that those who have never visited the dentist may have never needed treatment. Migrants with the perception that one has the chance of visiting a dentist when needed augmented self-rated oral health status and the perception of having good teeth in our study. Access to dental services is usually limited, especially for undocumented migrants who also report lower oral health

status in other studies [49]. These disparities in dental health outcomes and access within the migrant population are an urgent concern for the public health community, specifically the European public health community, due to its self-ascribed priorities. As part of Health 21, the World Health Organization's EU-focused policy framework to carry out its "health-for-all policy for the twenty-first century" platform, oral health care is prioritized for its impact on quality of life, disease prevention, and maintenance of good health, alongside its ease of prevention. In fact, the WHO notes that oral healthcare is the singular area of public health where "such a major problem can be so easily prevented through very simple methods" [50]. However, oral health services have become marked by a growing dental health divide. The WHO has raised concern that oral health services are not sufficiently used and accessible to those who face housing and diet insecurity, disability, ethnic or racial discrimination [27]. Meanwhile, a 2014 study by Tchicaya and Lorentz revealed "considerable socioeconomic inequalities" in the use of dental care in Europe [51]. Our study highlights this dental divide through the found prevalence of inadequate dental health among migrants with heightened disparities within migrant groups, according to age, sex, and education status, for example. It seems that while obtaining access to dental health services is an entitlement of asylum status, migrants continue to suffer from poor/fair dental health and dental caries, as well as a lack of service uptake.

A future program that addresses the combined issues of diet and dental prevention and hygiene information should be tested on these vulnerable population groups. As is already known, the current diet-print, especially for migrants and refugees from low-income countries in Europe, usually corresponds to low-calorie, fast-food type diets with ultra-processed foods, such as burgers, pizzas, French fries, chips, cakes, biscuits, and sweetened breakfast cereals [13,52], which are cheap, rich in fat, sugar, and other refined carbohydrates [53], but can obviously lead to a high prevalence of obesity and dental caries. [17,18,54–56] This dietary acculturation issues could be fulfilled by the implementation of a voluntary dental network, offering information on diet and dental health hygiene measures, as well as simple treatments, as a temporary solution. [49] However, the voluntary nature of dental care can result in a fragmented provision of oral health care, especially among undocumented migrants. [42] To reduce inequalities in oral health in the long term, systemic barriers in access to oral health care need to be addressed to understand that demographic factors act as risk factors for dental caries perception.

5. Strengths, Limitations, and Future Research Directions

To the best of our knowledge, this is among the first studies to assess demographic determinants of status and access to dental health care among multicultural migrant populations in several EU member states. Other studies [57] have addressed and shown how SES status affects oral health mainly in the general population, but this study has focused specifically on migrants from war-torn or poor countries characterized by specific vulnerabilities, such as feelings of discrimination, when accessing the health system. Another strength includes the breadth of our questionnaire, which investigated numerous demographic factors alongside assessments of physical and mental health. As a result, our study allowed for numerous comparative analyses between demographic and dental health factors. However, this study had also several limitations. Due to the nature of the design, the cross-sectional study provided a snapshot of the respondents' dental condition, and temporal constraints reduced the viability of assessing causal relationships between dental health determinants and outcomes. Furthermore, the self-administered questionnaire depended on self-reported information and assessments of health, which may introduce reporting bias. However, this study did not aim to clinically assess the dental health of newly arrived migrants, but rather to assess demographic factors and health determinants that may have an influence on it, in planning preventive interventions and to potentially predict the dental health status of populations in future migrant waves. In addition, the sample consisted of an overwhelmingly large proportion of male respondents, which may be a result of cultural barriers to female respondents. Finally, self-perception of oral health

was not related to clinical epidemiological oral health indicators or dento-occlusal aesthetic indicators, except for untreated decayed teeth. Although the dmft Index, DMFT Index and dmft/DMFT Index have been used intensively in clinical settings to assess dental caries prevalence, as well as dental treatment needs among populations [58], the use of these scores was not part of the study to check the association with self-perceived oral health, as was the case in other studies. [59] Since the proximal consequence of dental decay is pain [60], it is likely that the contribution of decayed untreated teeth to self-reported oral health is viewed by migrants through their subjective measures [61].

For the basis of prospective studies, our results could be used to further investigate the dental caries prevalence and oral health status in different migrant settings (urban/non-urban) within documented or non-documented people and access among subsets of migrant groups, as divided by the identified demographic determinants.

6. Conclusions

This study showed that many migrants report poor dental health and that the risk factors for poor dental health are numerous. Overall, higher education levels, legal permission status, better general and mental health, lower age, parental status, lower sense of discrimination, and better access to dentists are positive predictors of having good teeth (teeth with no dental caries), and thus generally good oral health. The barriers to oral healthcare-seeking behaviors of immigrants, the change in dietary habits due to immigration, and the limited access to dental services in remote settling areas pose public health problems in the host countries. These findings act as important baseline indicators upon which oral health improvement policy for migrants can be set and monitored in the future.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The limited dataset used for this analysis is available upon reasonable request from the Mig-HealthCare consortium.

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