

# Comparing Oral Health Services Use in the Spanish and Immigrant Working Population

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**Abstract** We aim to analyze oral health services use and related factors in the immigrant working population compared to the Spanish counterparts. Cross-sectional study of working population ( $n=8591$ ) that responded Spanish National Health Survey (SNHS), 2011–2012. The association between oral health services use and migration status was estimated using logistic regression. Immigrant men presented a greater probability of oral health service use a year or more prior (aOR 1.63; 95% CI 1.26–2.02), independently of oral health, sociodemographic and socioeconomic characteristics. In immigrant women, greater probability of use of oral health services one year or more prior disappeared after adjusting for the same variables (aOR 1.15; 95% CI 0.91–1.45). Occupational social class and education level could explain better a high percentage of oral health service use one year or more prior in immigrant women but there is a persistent inequality in oral health service use in immigrant men.

**Keywords** Emigrants and immigrants · Migrant workers · Dental health · Health surveys

## Introduction

Oral health is a component of general health and an important public health topic. According to the American Dental Association (ADA), regular visits to the dentist are important because they help with the timely identification of oral health problems and other problems with dental implications; thus, dental visits are recommended at least once or twice per year [1]. The proper frequency of oral health service use can contribute to improvements in self-perception and state of oral health, which influences quality of life at both an individual and collective level [2, 3].

According to Aday and Andersen's model [4], health service use depends on an interaction between individual and contextual factors. Different aspects have been identified that could influence and modify both access as well as use of oral health services: pre-disposing factors related to sociodemographic profile, lifestyles and individual biological conditions; facilitation factors related to public health insurance coverage; and factors related to the state of oral health and result in the need for these services [5].

In Spain, oral health services are mostly private. The Ministry of Health defines oral health promotion activities, distinguishing between specific groups. In the area of general dentistry, the adult population only has access to check-ups and extractions in the presence of an acute infection. Furthermore, health promotion and prevention activities are only directed at the child population [6]. This type of coverage means that, in Spain, access to oral health services is assumed privately.

A study of 24 European countries including Spain recognized the existence of socioeconomic inequalities in the use of oral health services [7]. Identification of the population groups most affected by these inequalities is especially important.

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One group that has emerged as a group to study is the immigrant population, which has gradually increased in Spain, reaching 10% of the population [8]. One of the principal motivations for migrating to another country is related to work. From 2001 to 2011, the immigrant working population increased from 5.6 to 12.5% [9]. Various studies have shown inequalities in access to certain health services for the immigrant population [8–10]. Related to inequalities in access to oral health services and state of oral health, countries like Canada and the United States have carried out studies of different age groups and have identified the existence of disparities in the use of oral health services and the state of oral health between the autochthonous and immigrant population [11–15].

In Spain a 2009 study related to health service use of the adult immigrant population-based on health surveys in Catalonia in 2006, Madrid in 2005, Canary Islands in 2004, and the Valencian Community in 2005- includes a “visit to a dentist” in its analysis; there were fewer dental visits among the immigrant population with origins in Africa and Asia compared to the Spanish population, adjusted by age, social class and self-reported state of oral health-dental decay, gingival bleeding and tooth loss- [10]. To the best of our knowledge, there have not been studies in Spain focused on use of oral health services in the immigrant and Spanish working populations.

Therefore, this study was proposed with the objective of comparing the use of oral health services- and associated factors- between the immigrant and Spanish working populations, using data from the Spanish National Health Survey of 2011–2012 (SNHS 2011–2012).

## Methods

### Data Source

Data come from the Spanish National Health Survey (SNHS) [16]. This is a cross-sectional survey carried out from July 2011 to July 2012 through personal interviews, which are freely accessed and confidential in nature in accordance with the criteria of the Spanish Law on Public Statistics for Confidentiality and Anonymity of Data [17].

Interviewees were selected after a three-stage, stratified sampling process. First, census sections were grouped into strata according to municipal size. Second, households were randomly selected and third, an adult in each household was randomly selected. Questionnaires were administered through computer assisted personal interviews within the interior of each home across the country. The response rate was 71.06% [17].

For this study, only cases of those actively working at the time of the interview were selected (in any paid

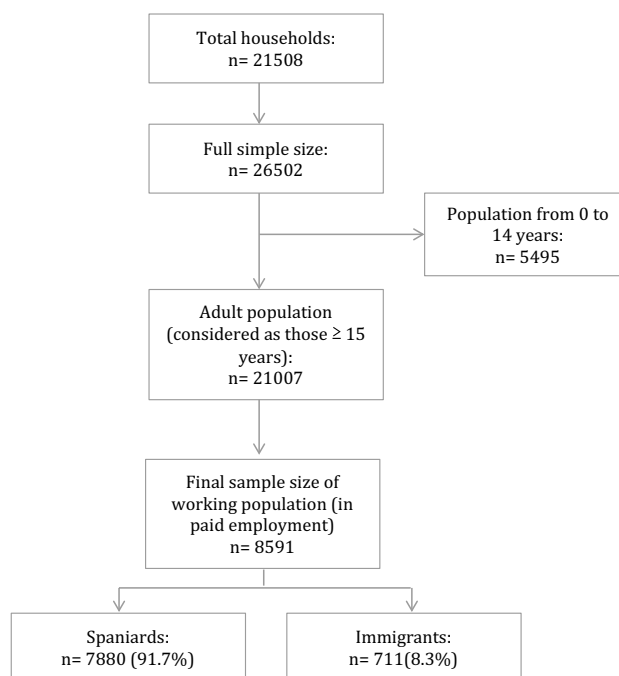
employment). The sample size was 8591 individuals. Figure 1 shows the flowchart for the selection of the final sample.

### Study Variables

The dependent variable is use of oral health services, obtained from responses to the question regarding one’s last visit to a dentist, stomatologist or dental hygienist for an exam, consultation or treatment for dental problems (question N56 of the questionnaire). The response options were re-categorized to construct a dichotomous variable: less than 1 year prior (categories “less than 3 months ago,” and “between 3 months and 1 year ago” were unified); and 1 year or more prior (categories “1 year or more” and “never”).

The principal independent variable was migration status. Immigrants were defined as persons born in low income countries (not classified by the International Monetary Fund as advanced economies) and who had resided in Spain for at least 2 years, following the definition of Eurostat [18]. Spaniards were defined as the population born in Spain and served as the reference group.

With respect to state of oral health, variables used were self-reported dental decay, tooth loss and gingival bleeding. These are included in the question related to self-reported oral health, and the variables were re-categorized into



**Fig. 1** Flowchart for the process of the selection of the final sample

“yes” (presence of the problem) and “no” (absence of the problem).

The sociodemographic variables included: age in years; sex; education level grouped in three categories: “university studies”, “secondary school or basic education level”, and “no schooling”; occupational social class dichotomized in the categories “manual” and “non-manual” [19]; employer relationship in terms of labor contract, via five categories: “business with employees”, “self-employed/ contractor without employees or with family support”, “permanent or official contract”, “temporary contract”, “verbal contract or no contract”, and finally “other situation”.

## Analysis

Weights derived from the complex sample design were included. All analyses were stratified by sex. Prevalences and Chi square tests were carried out to study the differences between qualitative variables, the Mann–Whitney U test was calculated with respect to age. Seven logistical regression models were developed to estimate the adjusted odds ratios (aOR) with confidence intervals of 95% (CI 95%). Model 1 uses the variable “migration status” adjusted by age, Model 2 builds upon Model 1 and adjusts for “state of oral health” (self-reported dental decay, tooth loss and gingival bleeding). For Models 3 through 5, each variable was included independently and separately, building on Model 2. Model 6 builds upon Model 2 and adjusts for education level and occupational social class, and Model 7 includes adjusting by all of the variables. Sampling weights were applied derived from the sample design. All of the statistical analyses were carried out using statistical software SPSS version 20.

## Ethics

This study is based on secondary sources of data provided for the Ministry of Health Social Services and Equity in Spain. The microdata files are open access and the participants cannot be identified. Ethical approval of the study was not necessary.

## Results

Table 1 shows the distribution of socioeconomic characteristics, state of oral health and use of oral health services in working immigrants and Spaniards, stratified by sex. A greater proportion of Spanish women reported university studies (31.9%) compared to immigrants (12.9%). 74.7% of immigrant men and 82% of immigrant women were manual workers. Immigrants reported greater frequency of temporary contracts (men: 25.2% and women:

21.7%) than did Spaniards (men: 12.5% and women: 16.5%), and among immigrants, there was greater prevalence of temporary contracts in men than in women.

The immigrant working population registered a lower proportion of oral health visits within 1 year prior (men: 33.6% and women: 41.7%) compared to the Spanish population (men: 45.0% and women: 50.2%). A greater proportion of self-reported dental caries was observed in immigrant women (28%) than in Spanish women (23.9%). The prevalence of extractions (lost teeth) was greater in the Spanish population (men: 69.9% and women: 69.4%) than in immigrants (men: 63.8% and women: 55.9%). The prevalence of gingival bleeding was greater in Spanish women (19.2%) than in immigrant women (13.7%) (Table 1).

Table 2 shows the prevalence of oral health service use 1 year or more prior in men and women, both Spanish and immigrant, taking into account sociodemographic, socioeconomic and state of oral health related variables. Related to education level, those with the greatest prevalence of oral health service use more than 1 year prior were those with secondary education, with the greatest difference in prevalence in the immigrant population (men: 74.9 and women: 75.5%), compared to the Spanish population (men: 69.9% and women: 64.0%). Also, there was a greater prevalence of oral health service use 1 year or more prior in the manual social class, with a greater proportion among the immigrant population (men: 80.0% and women: 79.5%), compared to the Spanish population (men: 59.2% and women: 53.6%). Related to employer relationship related to labor contract, there was a greater prevalence observed in oral health service use a year or more prior in the immigrant population (men: 27.2% and women: 23.6%) than the Spanish population with temporary contracts (men: 13.4% and women: 16.5%).

Table 3 shows the multivariate logistic regression models for oral health service use. Model 1, which adjusts the principal independent variable “migration status” by age, shows that immigrants have a greater probability of oral health service use 1 year or more prior than Spaniards (men aOR 1.63; IC95% 1.30–2.05, women aOR 1.41; IC95% 1.13–1.76). In Model 2, which adds the variable “oral health status” (self-reported dental decay, tooth loss and gingival bleeding) to Model 1, the greater probability of health service use 1 year or more prior persists in the immigrant population (men aOR 1.60; IC95% 1.26–2.02, women aOR 1.30; IC95% 1.03–1.63). In immigrant men, this greater probability compared to Spaniards is maintained in Model 7 (aOR 1.45; IC95% 1.15–1.84), which adjusts for all variables. In the case of immigrant women, however, the greater probability of oral health service use 1 year or more prior disappears once education level is included, in Model 3 (aOR 1.16; IC95% 0.93–1.46) and in later models.

**Table 1** Percentage distribution of the Spanish and Immigrant working population according to sociodemographic, socioeconomic, use of oral health services and oral health status, by sex. SNHS 2011–2012

Variables <sup>a</sup>	Males <sup>a</sup>			Females <sup>a</sup>		
	Spanish	Immigrants	p-value <sup>c</sup>	Spanish	Immigrants	p-value
	n (%)	n (%)		n (%)	n (%)	
Age <sup>b</sup> , median (IR)	42 (34–51)	39 (33–46)	<0.001	41(33–49)	39 (33–47)	0.175
Education						
University	977 (22.2)	63(17.8)	0.15	1108 (31.9)	46 (12.9)	<0.001
Secondary	3021 (68.6)	255(72.1)		2112 (60.7)	264 (74.0)	
Primary/no studies	404 (9.2)	36 (10.1)		257 (7.4)	47 (13.1)	
Occupational social class						
Non-manual	2026 (46.4)	90 (25.3)	<0.001	1785 (51.6)	63 (18.1)	<0.001
Manual	2341 (53.6)	264 (74.7)		1677(48.4)	286 (81.9)	
Labour relationship						
Manager (with employees)	311 (7.1)	19 (5.3)	<0.001	145 (4.2)	10 (2.8)	<0.001
Self-employed (without employees)	668 (15.2)	37 (10.5)		350 (10.1)	23 (6.4)	
Permanent contract	2688 (61.1)	189 (53.4)		2203 (63.3)	188 (52.7)	
Temporary contract	550 (12.5)	89 (25.2)		562 (16.2)	77 (21.7)	
Verbal/no contract	125 (2.9)	9 (2.6)		162 (4.7)	45 (12.6)	
Other	59 (1.3)	11 (3.0)		56 (1.6)	14 (3.8)	
Use of oral health services						
<1 year	1981 (45.0)	119 (33.6)	<0.001	1747 (50.2)	149 (41.7)	0.002
≥1 year/never	2421 (55.0)	235 (66.4)		1731 (49.8)	208 (58.3)	
Self-perceived oral health status						
Dental caries						
Yes	1219 (27.7)	100 (28.2)	0.078	833 (23.9)	100 (28.0)	0.004
No	3072 (69.8)	238 (67.3)		2563 (73.7)	240 (67.2)	
Lost teeth						
Yes	3076 (69.9)	226 (63.8)	0.016	2414 (69.4)	199 (55.9)	<0.001
No	1320 (30.0)	128 (36.2)		1060 (30.5)	155 (43.4)	
Gingival bleeding						
Yes	685 (15.6)	48 (13.5)	0.310	668 (19.2)	49 (13.7)	0.013
No	3710 (84.3)	306 (86.5)		2807 (80.7)	305 (85.6)	
Total	4402 (92.5)	354 (7.4)		3478 (90.7)	357 (9.3)	

IR interquartile range

<sup>a</sup>Values are weighted. Missing values: Occupational social class (n=59); self-perceived dental caries (n=227), lost teeth (n=12), gingival bleeding (n=12)

<sup>b</sup>Age in years

<sup>c</sup>Mann–Whitney Test for non-parametric data and Chi square test for categorical variables

## Discussion

This study compares oral health service use between immigrant and Spanish workers accounting for the influence of sociodemographic variables and the state of oral health of men and women. The results show significant differences in the proportions of oral health service use among men and women, immigrants and Spaniards. More than 50% of both population groups uses oral health services 1 year or more prior, with a greater proportion among immigrants. The greater probability of oral health service use 1 year

or more prior in immigrant men and women is maintained when adjusting by age and state of oral health, however, when adjusting by other variables such as educational level and social class this greater probability disappears in immigrant women and, in contrast, is maintained in men.

Over 50% of both Spanish and immigrant workers fail to comply with ADA recommendations [1] and those of health authorities of Organization for Economic Cooperation and Development (OECD) countries [20] related to frequency of annual dental visits. The lowest use of services is among immigrants. It should be noted that, in

**Table 2** Prevalence of use of the oral health services (1 year or more prior) between Spanish and Immigrant workers according to sociodemographic, socioeconomic, use of oral health services and oral health status, by sex. SNHS 2011–2012

Variables	Males <sup>a</sup>		Females <sup>a</sup>	
	Spanish	Immigrants	Spanish	Immigrants
	n (%)	n (%)	n (%)	n (%)
<b>Education</b>				
University	459 (19.0)	26 (11.1)	457 (26.4)	22 (10.6)
Secondary	1692 (69.9)	176 (74.9)	1107 (64.0)	157 (75.5)
Primary/no studies	270 (11.2)	33 (14.0)	167 (9.6)	29 (13.9)
<b>Occupational social class</b>				
Non-manual	979 (40.8)	47 (20.0)	799 (46.4)	42 (20.5)
Manual	1420 (59.2)	188 (80.0)	922 (53.6)	163 (79.5)
<b>Labour relationship</b>				
Manager (with employees)	147 (6.1)	11 (4.7)	65 (3.8)	1 (0.5)
Self-employed (without employees)	378 (15.6)	25 (10.6)	201 (11.6)	13 (6.3)
Permanent contract	1462 (60.4)	123 (52.3)	1053 (60.8)	111 (53.4)
Temporary contract	325 (13.4)	64 (27.2)	285 (16.5)	49 (23.6)
Verbal/no contract	73 (3.0)	7 (3.0)	89 (5.1)	31 (14.9)
Other	36 (1.5)	5 (2.1)	38 (2.2)	2 (1.0)
<b>Self-perceived oral health status</b>				
<b>Dental caries</b>				
Yes	800 (34.3)	76 (34.4)	492 (29.6)	70 (36.1)
No	1529 (65.7)	145 (65.6)	1172 (70.4)	124 (63.9)
<b>Lost teeth</b>				
Yes	1589 (65.8)	142 (60.4)	1157 (67.0)	101 (49.0)
No	827 (34.2)	93 (39.6)	571 (33.0)	105 (51.0)
<b>Gingival bleeding</b>				
Yes	391 (16.2)	27 (11.5)	363 (21.0)	27 (13.2)
No	2025 (83.8)	208 (88.5)	1366 (79.0)	178 (86.8)
<b>Total</b>	<b>2421 (55.0)</b>	<b>235 (66.4)</b>	<b>1731 (49.8)</b>	<b>208 (58.3)</b>

<sup>a</sup>Values are weighted. Missing values: Occupational social class (n=59); self-perceived dental caries (n=227), lost teeth (n=12), gingival bleeding (n=12)

**Table 3** Multivariate logistic analysis for the probability of use of oral health services (1 year or more prior) in immigrant workers living in Spain, stratified by sex. SNHS 2011–2012

Variables (multivariate logistic analysis) <sup>a</sup>	Males OR (95% CI)	Females OR (95% CI)
Spanish	1.00	1.00
Immigrants	1.62 (1.29–2.03)	1.41 (1.13–1.76)
Model 1: adjusted by age	1.63 (1.30–2.05)	1.41 (1.13–1.76)
Model 2: Model 1 + adjusted by Self perceived oral health status (dental caries, Lost teeth, gingival bleeding)	1.60 (1.26–2.02)	1.30 (1.03–1.63)
Model 3: Model 2 + adjusted by Educative level	1.56 (1.23–1.97)	1.16 (0.93–1.46)
Model 4: Model 2 + adjusted by Occupational social class	1.46 (1.15–1.85)	1.19 (0.94–1.50)
Model 5: Model 2 + adjusted by labour relationship	1.56 (1.23–1.97)	1.27 (1.01–1.59)
Model 6: Model 2 + adjusted by educative level, occupational social class	1.47 (1.16–1.86)	1.15 (0.91–1.46)
Model 7: adjusted by all variables	1.45(1.15–1.84)	1.15 (0.91–1.45)

<sup>a</sup>All models were conducted with weighted data

the OECD's health report, Spanish is one of the 5 countries with the lowest probabilities of dental visits [20]. It is possible that these results and inequalities observed among the immigrant and Spanish working population is due to the limited oral health service coverage in Spain [2]. As previously observed, those who live in countries with low levels of coverage tend to report more frequent dissatisfaction of dental needs than those in countries with higher levels of coverage [7].

The greater probability of oral health service use 1 year or more prior among immigrant women disappears when taking into account occupational social class and education level, which indicates that inequalities in education level and occupational social class have great influence on oral health service use. These inequalities could be related to work load and remuneration type, among other aspects. Immigrant women in Spain are potentially the most vulnerable group with the least employment protection [9]. In agreement with these results, some studies have shown socioeconomic inequalities in the lack of oral health service use in the general population [15, 20, 21]. In one study carried out in 24 European countries, in two-thirds of studied countries, women cited financial reasons as their principal reason for not seeking dental attention. A social gradient related to education level was also identified in the lack of oral health services [7].

In this study, we found that being a male immigrant worker was significantly associated with oral health service use 1 year or more prior, compared to working Spanish men (after adjusting for different variables). This situation is similar to what was found in a study by Regidor et al., which also included a multivariate model with similar variables, in which the majority of immigrants—especially those from Africa, Asia and Oceania—had less frequent use of oral health services than the Spanish population, with the exception of immigrants from Western countries [10].

The differences found between immigrant men and women in the probability of oral health service use 1 year or more prior could be related to other study results, in which women were found to have more favorable oral health habits and more frequent use of oral health services than men [3, 22]. These differences can be explained from a gender perspective, in which standards related to beauty and personal aesthetics can lead to a greater demand for dental care by women compared to men [3].

The self-perceived state of oral health is a factor that determines use of health services. The literature has reported important gaps in the normative need for oral health care and the self-perceived need [2, 23]. In this study, inequalities in occupational social class and education level explain a high percentage of oral health service use 1 year or more prior in immigrant women.

Among its limitations, this study is based on a survey that is self-reported, and therefore the state of oral health could be underestimated or overestimated in the studied population. However, self-reported health variables are being used more frequently in epidemiologic studies thanks to their validity in predicting morbi-mortality and their use in follow-up of population groups with specific health problems as well as measurement of the effectiveness of interventions [24]. Further studies that categorize migration status by country of origin could be of great importance, given that the cultural and ethnic diversity of the immigrant population could also influence oral health service use. To study this, a larger and more representative sample of the immigrant population would be needed, at least in terms of those groups most relevant in Spain.

In conclusion, migration status appears to be related to inequalities in access to oral health services among working men, independent of sociodemographic and socioeconomic factors. It could be that there are other variables, such as cultural variables, that may explain this inequality. Immigrant women working in Spain confront inequalities in access to oral health services that can be explained by socioeconomic situation and education level. Access to oral health services can contribute to the improvement in health with repercussions for both personal and labor related quality of life. Therefore, policies that favor equity in access to these services are recommended.

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**Compliance with Ethical Standards**

**Conflict of interest** All authors declares that they have no conflict of interest.

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