Research Article

Prevalence of Chronic Diseases in Immigrant and Native-Born Women in Spain During Pregnancy. A Retrospective, Observational Study

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Abstract

Background: Immigration has become a social concern due to the faster increasing proportion of international migrants. Health status in migrant people declines with increased length of stay in the host country and women have higher morbidity. Comorbidities in pregnancy are frequent and that they carry risks in the newborn, the objective of this study is to determine their prevalence according to the different ethnic groups.

Methods: We performed a retrospective observational cohort study in pregnant women between 2012 and 2018 in the Lleida health region. Comorbidity in pregnancy was collected and compared between immigrants and Spanish. The risk of comorbidity was calculated using univariate and multivariate logistic regression analysis with adjustment for the variables included in the descriptive analysis.

Results: We analyzed a sample of 17177 pregnant women representing the 86% of the total of pregnant women in the health region of Lleida. The highest percentage of women come from West Europe (63%) and the lower percentage from Asia and the Middle East (1,4%). Besides, Eastern Europe women were the younger (medium age 29,7 years old) while the older were from West Europe (medium age 30,9 years old).

Sub Saharan Africa women have the highest prevalence of hypertension (7%), furthermore, the prevalence of diabetes mellitus and obesity was observed in these women together with Maghreb's women.

The multivariate model according to country of origin compared with autochthonous population (West Europe) shows an increased risk of overweight and obesity in Sub Saharan, Maghreb, and Latin America population. Asian and the Middle East and Maghreb women had a higher risk of diabetes mellitus while being from Latin America and Eastern Europe has a protective effect for this disease. Only Sub-Saharan Africa women have increased risk of hypertension. Finally Sub-Saharan Africa, Asian and the Middle East and Maghreb had lower risk of depression compared with autochthonous population.

Conclusions: The immigrant population generally presents a higher risk of diabetes, overweight/obesity, and hypertension compared to the native population; however, there are variations in risk depending on the country of origin.

Introduction

Immigration has become a social concern due to the faster increasing proportion of international migrants. From 2010 to 2019 we have seen an increase of 23,1% which represents 272 million of migrants in the world. Europe hosts the largest number of international migrants (82 million), the second is Northern America (59 million) and third Northern Africa and Western Asia (49 million) [1].

In Spain, immigration represents up to 14,4% of the population [2]. During 2019, in Catalonia, 15% more immigrants settled compared to 2018, which represents 203.843 people from outside of Spain. Almost 42% of this population come from America (both Northern and Southern America), 15% come from European Union and around 13% from Africa, and only 10% come from Asia and Oceania [3].

Migrants often encounter linguistic, social, political, and economic barriers, which have been reported to reduce access to health systems and increase morbidity [4-6]. The experiences and health status of the migrant population vary by sex. Although many studies of migrant population have confirmed that within migrant population health status is better at arrival rapidly declines with increased length of stay in the host country [7]. In addition, women have higher morbidity and worse perceived health than men, and a more rapid loss of quality of life once in the host country [8-13].

Some studies reported a higher prevalence of obstetrical and perinatal problems in immigrant women when compared with native residents [14-16]. Even so, there are still controversies about how immigration can affect the state of maternal and fetal health.

Knowing that diseases such as diabetes mellitus and hypertension are frequent and that they carry risks in the newborn, the objective of this study is to determine their prevalence according to the different ethnic groups to influence their prevention and follow-up.

Material and Methods

Study Design and Data Collection

We conducted a retrospective observational cohort study among pregnant women in the health region of Lleida during the years 2012-2018.

The data of women who had given birth at the Arnau de Vilanova Hospital between January 1, 2012 and December 31, 2018 were obtained through the CMBD database ("Conjunt Mínim de Base de Dades"). In particular, the data of all the eligible patients assigned to a primary care unit derived from the computerized clinical history database E-CAP of the Catalan Health Institute; and data from Social Security prescriptions derived from the database of the Servei Català de Salut.

This article is part of the Iler Pregnancy project, retrospective cohort study conducted in Lleida with the aim of evaluating the prevalence of chronic pathologies in pregnancy (hypothyroidism, depression, diabetes mellitus and obesity) and therapeutic adherence to prescribed drugs [17-21].

Study Population

Women who have had a birth at the Arnau de Vilanova University Hospital in Lleida between January 1st, 2012 and December 31st, 2018 were included in the study. Women who did not

Table 1: Number of births registered in our sample in comparison to the Lleida health region per years.

Year	Deliveries in our sample	Deliveries from Idescat	Sample/Idescat
2012	3635	3788	96%
2013	3370	3535	95%
2014	3308	3592	92%
2015	3162	3426	92%
2016	3180	3283	97%
2017	3034	3197	95%
2018	3001	3029	99%

belong to Lleida health region were excluded. To evaluate the representativeness of the sample, we calculated the percentage of pregnant women studied compared to the total of pregnant women in the health region of Lleida. Data were obtained from the database of the "Instituto Statistics of Catalonia" (Idescat) (Table 1). We included data from the date of the last period to the date of delivery.

The following variables were recorded: region of origin (Sub Saharan Africa, Latin America, Asia and the Middle East, West Europe, Eastern Europe, and Maghreb) (19); body mass index (BMI) which is classified according to low weigh (BMI under

18.5 Kg/m2), overweigh (BMI between 25 to 29.9) and obesity (IMC more than 30); number of pregnancy and twin pregnancy; risk during pregnancy; diabetes and mellitus (code O24.9 at CIE-10.); arterial hypertension (code I10-I16 at l'ICD-10); dyslipidemia (code E78 at l'ICD-10) and depression (codes F32.0-F32.9, F33.0-

F33.3, F33.8, F33.9, F34.1, or F41.2 at l'ICD-10).

Data Analysis

We performed a descriptive analysis. Numerical variables were described by mean and standard deviation, and categorical variables by absolute and relative frequencies. Differences between groups were evaluated using Student's t-test or Chi-square test, depending on whether the variables were numerical or categorical, respectively. The relationship between hypothyroidism and other variables was analyzed using multivariate logistic regressions and adjusted Odds Ratio (OR) and the respective 95% Confidence Intervals (CI) were reported.

Ethical Aspects

This study was approved by the ethics and clinical research committee at the Institut d'Investigació IDIAP Jordi Gol under the code 19/195-P and carried out in accordance with the principles of the Declaration of Helsinki. Information was obtained from electronic medical records stored in the centralized ECAP database and extracted by the Department of Healthcare Evaluation and Research Management. Therefore, it was not necessary to ask participants for their informed consent. The variables in the ECAP database were processed anonymously and with full confidentiality guarantees as established by national law and Regulation 2016/679 of the European Parliament and of the Council on the protection of natural people regarding the processing of personal data, and to the free movement of such data.
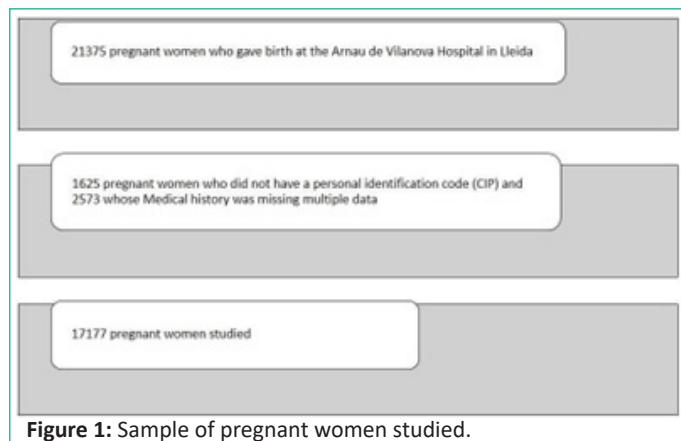
Results

We started with a sample of 21375 women who had given birth at the Arnau de Vilanova Hospital in Lleida between 2012 and 2018 (both included). Of this sample 1625 were excluded

because they did not have a personal identification code (CIP), and 2573 because multiple data from the clinical history were missing. The final sample included 17177 patients (Figure 1).

The population distribution according to the region of origin was Sub Saharan Africa (5,6%), Latin America (4,8), Asia and the Middle East (1,4%), West Europe (63%), Eastern Europe (10,3%), and Maghreb (14,9%). There was a similar percentage in the different years of study (Table 2). The lower age was observed on Eastern Europe women (29,7 years old) and women from the West Europe were the oldest (medium age 30,9 years old). The BMI was higher between Sub Saharan Africa pregnant women. According to pregnancy number the most part of the sample was on the first or the second pregnant process. Almost 50% of the patients do not present any risk of pregnancy except the Sub-Saharan Africa women where only 37,9% were free of risk (Table 3).

Table 2: Distribution by years according to region of origin.

	Sub Saharan Africa	Latin America	Asia and the Middle East	West Europe	Eastern Europe	Maghreb
2012	118(14%)	131(18,3%)	49(22,1%)	1436(15,2%)	216(14,1%)	377(16,9%)
2013	115(13,7%)	117(16,3%9	29(13,1%)	1409(14,4%)	196(12,8%)	291(13%)
2014	113(13,5%)	103(14,4%)	21(9,5%)	143(15,2%)	230(15%)	308(13,8%)
2015	116(12,6%)	85(11,9%)	30(13,5%)	1388(14,7%)	220(14,4%)	312(14%)
2016	106(12,6%)	105(14,6%)	33(14,9%)	1309(13,8%)	225(14,7%)	339(15,2%)
2017	132(15,7%)	94(13,1%)	33(14,9%)	1273(13,5%)	238(15,5%)	291(13%)
2018	140(16,7%)	82(11,4%)	27(12,2%)	1208(12,8%)	208(13,6%)	315(14,1%)

Figure 1: Sample of pregnant women studied.

Table 4 shows a distribution of chronic disease according to region of origin. On the one hand, is observed than 7% of Sub-Saharan Africa women have hypertension compared the 1,2% of Asia and the Middle East women. On the other hand, 14,4% of this woman present diabetes mellitus, being the ones with the highest prevalence along with the maghribs women. A lower prevalence of dyslipidemia was observed on Asia and the Middle East women but this was not statistically significant. Finally, the highest prevalence of obesity was observed on the African woman (both Sub Saharan and Maghreb).

The multivariate model according to country of origin compared with autochthonous population (West Europe) shows and increased risk of overweight and obesity in Sub Saharan (OR 2,79, 95% CI 2,35-3,30), Maghreb (OR 3,71, 95% CI 3,33-4,15), and Latin America population (OR 1,43, 95CI 1,20-1,71). Asian and the Middle East (OR 1,88, 95% CI 1,26-1,71) and Maghreb (OR 1,48, 95% CI 1,28-1,72) women had a higher risk of diabetes mellitus while being from Latin America (OR 0,73, 95% CI 0,53-0,99) and Eastern Europe (OR 0,80, 95% CI 0,63-0,98) has a protective effect for this disease. Finally Sub-Saharan Africa (OR 0,28, 95% CI 0,12-0,55), Asian and the Middle East (OR 0,15, 95% CI 0,01-0,67) and Maghreb (OR 0,53, 95% CI 0,37-0,75) had lower risk of depression compared with autochthonous population. All this difference were statistically significant (Figures 2-6).

Discussion

We analyzed a sample of 17177 pregnant women representing the 86% of the total of pregnant women in the health region of Lleida. The highest percentage of women come from West Europe and the lower percentage from Asia and the Middle East. Besides, Eastern Europe women were the younger while the older were from West Europe.

Sub Saharan Africa women have the highest prevalence of hypertension, furthermore, the prevalence of diabetes mellitus and obesity was observed in these women together with Maghreb's women.
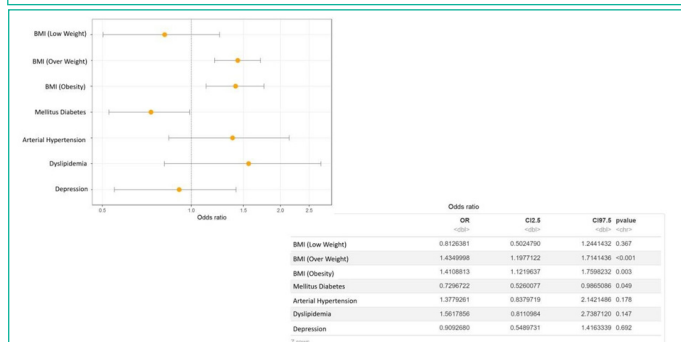
The multivariate model according to country of origin compared with autochthonous population (West Europe) shows an increased risk of overweight and obesity in Sub Saharan, Maghreb, and Latin America population. Asian and the Middle East and Maghreb women had a higher risk of diabetes mellitus

Table 3: Distribution according to characteristics of pregnant women.

	Sub Saharan Africa	Latin America	Asia and the Middle East	West Europe	Eastern Europe	Maghreb	Valor p
Age	30,6(5,8%)	29,5(6,4%)	29,1(5,8%)	30,9(5,7%)	28,7(5,6%)	29,8(5,7%)	<0,001
Body Mass Index	26,9(5,8%)	25,2(4,8%)	24(4,2%)	24,2(4,9%)	24,1(4,4%)	27,2(4,7%)	<0,001
Pregnancy Number							<0,001
> 4	70(8,3%)	15(2,1%)	7 (3,2%)	169(1,8%)	19(1,2%)	98(4,4%)	
1	336(40%)	436(60,8%)	108(48,6%)	5313(56,2%)	899(58,6%)	766(34,3%)	
2	239(28,5%)	182(25,4%)	74(33,3%)	2896(30,6%)	455(29,7%)	735(32,9%)	
3	136(16,2%)	63(8,8%)	26(11,7%)	830(8,8%)	126(8,2%)	451(20,2%)	
4	59(7,0%)	21(2,9%)	7 (3,2%)	253(2,7%)	34(2,2%)	183(8,2%)	
Twin Pregnancy							1,000
No	840(100%)	717(100%)	222(100%)	9460(100,0%)	1533(100%)	2233(100%)	
Yes	0(0,0%)	0 (0,0%)	0 (0,0%)	1(0,01%)	0 (0,0%)	0 (0,0%)	
Risk of Pregnancy							<0,001
High risk	208(27,5%)	140(21,3%)	42(23%)	1483(17,4%)	205(14,4%)	381(19,2%)	
Medium risk	240(31,7%)	170(26%)	50(27,3%)	2561(30%)	386(29%)	553(27,8%)	
Very high risk	22(3%)	12(1,8%)	0 (0,0%)	173(2%)	15(1,1%)	23(1,2%)	
Risk free	287(37,9%)	335(51%)	91(49,7%)	4322(50,6%)	724(54,4%)	1029(51,8%)	

Table 4: Prevalence of chronic diseases according to region of origin.

	Sub Saharan Africa	Latin America	Asia and the Middle East	West Europe	Eastern Europe	Maghreb	Valor p
Hypertension							<0,001
No	781(93%)	697(97,2%)	215(96,8%)	9268(98%)	1506(98,2%)	2188(98%)	
Yes	59(7,0%)	20(2,8%)	7(1,2%)	193(2,0%)	27(1,8%)	45(2,0%)	
Mellitus Diabetes 2							<0,001
No	768(91,4%)	673(93,9%)	190(85,6%)	8683(91,8%)	1431(93,3%)	1971(88,3%)	
Yes	72(8,57%)	44(6,14%)	32(14,4%)	778(8,22)	102(6,65)	262(11,7%)	
Hypothyroidism							<0,001
No	822(97,9%)	668(93,2%)	203(91,4%)	8768(92,7%)	1451(94,7%)	2124(95,1%)	
Yes	18(2,1%)	49(6,8%)	19(8,6%)	693(7,3%)	82(5,4%)	109(4,9%)	
Dyslipidemia							0,148
No	829(98,7%)	705(98,3%)	221(99,5%)	9359(98,9%)	1521(99,2%)	2218(99,3%)	
Yes	11(1,31%)	12(1,67%)	1(0,45%)	102(1,08%)	12(0,78%)	15(0,67%)	
Depression							<0,001
No	883(99,2%)	698(97,4%)	221(99,5%)	9186(97,1%)	1497(97,7%)	2198(98,4%)	
Yes	7(0,83%)	19(2,65%)	1(0,45%)	275(2,91%)	36(2,35%)	35(1,57%)	
Obesity							<0,01
No	609(74,7%)	607(85,3%)	197(91,6%)	8192(88,1%)	1364(90,3%)	1620(74,2%)	
Yes	(25,3%)	105(14,7%)	18(8,4%)	1103(11,9%)	146(9,7%)	563(25,8%)	
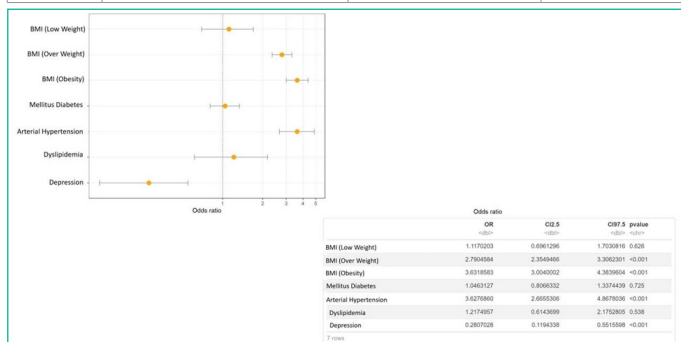
Figure 2: Multivariate model according to Sub-Saharan Africa origin compared with autochthonous population.

Figure 3: Multivariate model according to Latin America Origin compared with autochthonous population.

while being from Latin America and Eastern Europe has a protective effect for this disease. Only Sub-Saharan Africa women have increased risk of hypertension. Finally Sub-Saharan Africa, Asian and the Middle East and Maghreb had lower risk of depression compared with autochthonous population.

In our study the sub-Saharan Africa women present more comorbidity than other population, Brown et al. study, carried out in 2020 and which analyzes the risk of severe maternal morbidity among 1.280.925 delivery hospitalizations among women of different races, also confirms that deliveries among black women had a rate of maternal morbidity of 225,7 per 10.00 compared to 104,7 per 10.000 white women (OR 2,2, 95% CI 2,1-2,3). Brown et al. also demonstrates that 7% of black women had three or more comorbidities, compared to 4% of white women, 4% of Hispanic women and 3% of Asian women, this fact is also observed in our study, where African women (both sub-Saharan and Maghreb women) have a higher prevalence of obesity, hypertension, and diabetes mellitus [22].

Admon et al. [23] shows in his study that women with multiple chronic conditions have 3.8 times the rate of severe maternal morbidity and mortality compared to women without chronic conditions. In our study, Sub-Saharan women have more prevalence of comorbidities than other women and have more risk in pregnancy, almost 50% of the patients do not present any risk of pregnancy except the Sub-Saharan Africa women where only 37,9% were free of risk.

Furthermore, Metcalfe et al. developed a study in USA from 1993 to 2012, which concluded that women of minority race and ethnicity are at a higher risk of having chronic conditions during pregnancy, despite an overall increase in rates of chronic conditions among all pregnant women, with the difference in prevalence of one or more pre-existing comorbid conditions for black women (9,9%) nearly twice that of white women (5,6%) [24].

In a parallel line of research, other studies like Shah et al. one [25,26], has shown that Asian populations develop type 2 diabetes, gestational diabetes, and lower body mass index values than Europeans, which agrees with our study where being from Asia and de Middle East have a protector effect to develop diabetes mellitus. Similar results were observed in a study carried out in France [27], where they observed that women from North Africa and Turkey had a higher risk of overweight and gestational diabetes mellitus, while women from Eastern Europe and Asia had a lower risk of that; in addition, Sub-Saharan Africa had a higher risk of being overweight or obese pre pregnancy, these data are also consistent with those observed in our work.

Regarding arterial hypertension, Bastola et al. [28] carried out a study with women of Finnish origin and they conclude that the risk for any hypertensive disorders of pregnancy after adjustment for confounders was lower for women of migrant origin, with an exception for women of Sub-Saharan African origin. Knutzen et al. [29], also demonstrated the prevalence of chronic hypertension was higher in black (1,1%) and colored (1,7%) women compared to white women (0,6%). All these data are similar in our analysis, sub-Saharan African women show more risk than the rest of the groups.
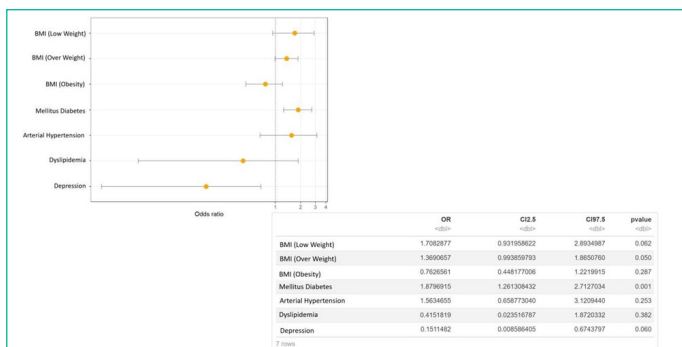
Figure 4: Multivariate model according to Asian and the Middle East origin compared with autochthonous population.
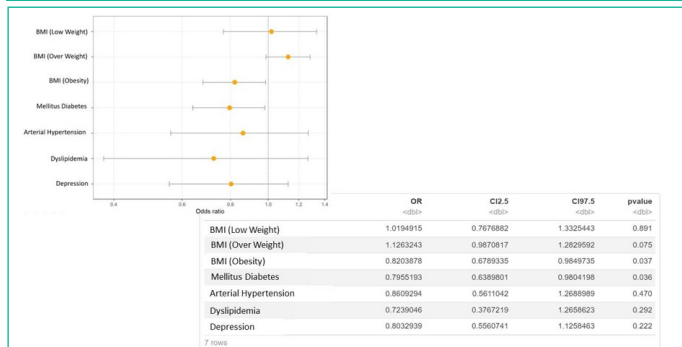

Figure 5: Multivariate model according to Eastern Europe origin compared with autochthonous population.
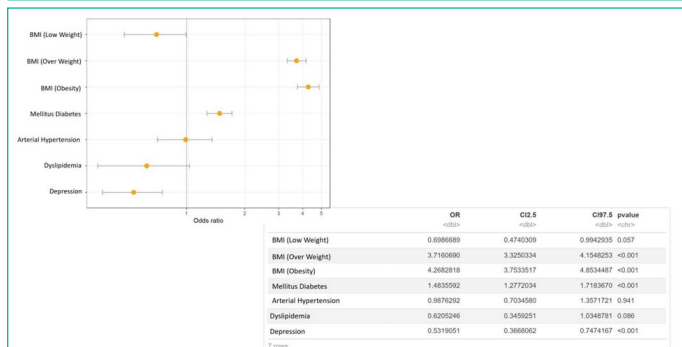

Figure 6: Multivariate model according to Maghreb origin compared with autochthonous population.

Finally, Sajuan et al. [30] found racial and ethnic differences in perinatal depression, on the one hand, Asian individuals had lower risk of perinatal depression and anxiety but higher risk of moderate/severe depression during pregnancy compared to Non-Hispanic White individuals; on the other hand, Non-Hispanic Black individuals had higher risk of perinatal depression, comorbid depression/anxiety, and moderate/severe and severe depression.

They also concluded that Hispanic individuals had lower risk of depression during pregnancy and perinatal anxiety but higher risk of postpartum depression and moderate/severe and severe depression during and after pregnancy. Besides, Shakeel et al. [31], who carried out a study in Oslo, reported that women from de Middle Easterners (mainly from Iraq, Iran, and Turkey) and South Asians (mainly from Pakistan and Sri Lanka) had significantly higher risk for depression than other minorities and Western Europeans in logistic regression models, OR 2,81; 95% CI 1,29-6,15 and OR 2,72, 95% CI 1,35-5,48 respectably. The methodological differences present in these studies, in which a screening of pregnant women is carried out, compared to our study that analyses diagnostic codes may justify these differences. A lower prevalence found in our study may be attributed to a lack of addressing the mental health of patients in medical consultations.

Difficulties and Limitations of the Study

We must point out possible limitations. First, we have not assessed the socioeconomic data that may influence health outcomes; on the other hand, the population groups analysed have been grouped into large groups and may not be homogeneous in their composition. This fact can make correct identification as a risk group difficult.

Conclusions

The immigrant population generally presents a higher risk of diabetes, overweight/obesity, and hypertension compared to the native population; however, there are variations in risk depending on the country of origin. These data suggest that the immigrant population from these regions can benefit from medical follow-up that addresses their needs.

Future research should include data on country of origin and examine the role of premigration and postmigration factors in developing chronic diseases and its associated short- and long-term outcomes

Author Statements

Ethics Declarations

This study was approved by the ethics and clinical research committee of the "Institute for Primary Health Care Research Jordi Gol i Gurina (IDIAPJGol)" under the code 19/195-P. The study was conducted in accordance with the principles of the Declaration of Helsinki. Pseudonymized retrospective descriptive cross-sectional study according to Additional Provision 17.2.d LOPD-GDD for research purposes, without the need to obtain the consent of the data holders, there is a technical and functional distance between the research team and the performer pseudonymization, and that the data is only accessible to the research team, and technical measures have been taken to prevent such re-identification and access by third parties through the CMBD database ("Conjunt Minim de Base de Dades") the E-CAP computerized medical history database and the Catalan Health Service database.

Competing Interests

The authors declare they have no competing interests.

Contributions

JS and LG conceptualized the study, analyzed the data, and wrote the first draft of the manuscript; MCS, MO, DP and JMJ contributed to the design of the study, data management, and manuscript development and review; BS also contributed to the

design of the study, and to the creation of data bases and data analysis. All authors read and approved the final manuscript.

Ethical Aspects

This study was approved by the ethics and clinical research committee at the Institut d'Investigació IDIAP Jordi Gol under the code 19/195-P and conducted in accordance with the principles of the Declaration of Helsinki. Information was obtained from electronic medical records stored in the centralized ECAP database and extracted by the Department of Healthcare Evaluation and Research Management. Accordingly, it was not necessary to ask participants for their informed consent. The variables in the ECAP database were processed anonymously and with full confidentiality guarantees as established by national law and Regulation 2016/679 of the European Parliament and of the Council on the protection of natural persons with regard to the processing of personal data, and to the free movement of such data.

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