Gac Sanit. 2018;32(6):547–552

Original article

Current active and passive smoking among adults living with same sex partners in Spain

Jaime Perales[a,*], Irene Checa[b], Begoña Espejo[b]

[a] Department of Preventive Medicine and Public Health, University of Kansas Medical Center, Kansas City, KS, USA
[b] Department of Behavioural Sciences Methodology, University of Valencia, Valencia, Spain

ARTICLE INFO

Article history:
Received 13 February 2017
Accepted 16 March 2017
Available online 19 May 2017

Keywords:
Sexual minorities
Tobacco
Tobacco smoke pollution
Surveys
Spain

ABSTRACT

Objective: To assess the association between current active and passive tobacco smoking and living with a same-sex partner in Spain.
Methods: We analysed data from two cross-sectional national surveys of the Spanish population 15 years and older (2011-Encuesta Nacional de Salud en España and 2014-Encuesta Europea de Salud en España). Analyses included only people living with their partner. Associations were calculated using multiple logistic regressions adjusting for gender, social class and age.
Results: Current active and passive smoking were significantly associated with living with same sex partners (odds ratio: 2.71 and 2.88), and particularly strong among women.
Conclusions: Spanish adults living with same-sex partners are at higher risk of active and passive smoking. This risk varies by gender. Spanish national surveys should include items on sexual orientation for improved data on health disparities.

Tabaquismo activo y pasivo en personas adultas que viven con una pareja del mismo sexo en España

Palabras clave:
Minorías sexuales
Tabaco
Contaminación por humo de tabaco
Encuestas
España

RESUMEN

Objetivo: Evaluar la asociación entre tabaquismo activo y pasivo y el hecho de vivir con una pareja del mismo sexo en España.
Métodos: Analizamos datos de dos encuestas nacionales de diseño transversal representativas de la población española de 15 y más años de edad (Encuesta Nacional de Salud en España 2011 y Encuesta Europea de Salud en España 2014). Los análisis incluyeron solamente gente que vivía con pareja. Las asociaciones se calcularon usando regresiones logísticas múltiples ajustando por sexo, clase social y edad.
Resultados: El tabaquismo, tanto activo como pasivo, se relacionó significativamente con vivir con una pareja del mismo sexo (*odds ratio*: 2,71 y 2,88, respectivamente), y la asociación fue especialmente fuerte en las mujeres.
Conclusiones: Las personas adultas españolas que viven con una pareja del mismo sexo tienen un riesgo mayor de tabaquismo, tanto activo como pasivo. Este riesgo varía según el sexo. Las encuestas nacionales españolas deberían incluir ítems sobre orientación sexual para una mejor recogida de información en desigualdades en salud.

Introduction

Tobacco use is the top preventable cause of death in Spain, killing more than 53,000 people yearly or one in every seven deaths.[1] The top causes of death and disability in Spain are highly associated with tobacco use.[2] In addition, the tobacco financial burden in Spain exceeds four billion Euros in yearly healthcare expenditures.[3]

A recent review of the literature indicated that tobacco use is more prevalent among sexual minorities.[4] Hypothesized mechanisms for this association include higher levels of alcohol use, depression, discrimination, homophobia, and targeting by the tobacco industry.[4–6] For example, according to the minority stress model, sexual minorities might experience a culturally rooted, chronic stress in the shape of negative experiences and depreciation that increases the risk of poor mental health.[4] Poor mental health is associated with health risk behaviours such as smoking that serve as coping mechanisms.[7] Sexual minorities are also more likely to be surrounded by people who smoke, which is associated with tobacco use, barriers in cessation and increased morbimortality.[8,9] However, many studies assessing tobacco disparities among sexual minorities have used non-probabilistic samples, and there is a lack of representative data. Most of these studies (about 85%) have been conducted in the USA.[10]

* Corresponding author.
E-mail address: jperales@kumc.edu (J. Perales).

https://doi.org/10.1016/j.gaceta.2017.03.006

To our knowledge, no Spanish study has assessed the association between sexual minorities and tobacco use at the national level. The 2010 European Men Who Have Sex with Men Internet Survey (EMIS) in Spain show that the prevalence of tobacco smoking in this group is 53.9%.[11] This prevalence is markedly higher than the Spanish average in other national surveys (26%).[12] However, the EMIS only included a non-probability sample of men who had sex with other men. Only one study has been conducted in Spain to assess the association between belonging to a sexual minority and smoking in a representative sample at the local level. Results from the Barcelona Health Survey show that the prevalence of current smoking among adults attracted by people the same sex was 61.6% whereas the prevalence among adults who had had sex with people the same sex was lower (42.0%).[13] The odds of current smoking compared to adults attracted or who had had sex exclusively with people the opposite sex were 2.32 and 1.44, respectively, and statistically significant after controlling for covariates. One of the reasons for the lack of research on LGBT disparities in tobacco use might be the non-inclusion of questions in national surveys on sexual orientation.[14] Sexual orientation was not assessed in important national surveys such as the Spanish National Health Survey (ENSE),[15] European Health Interview Survey in Spain (EESE),[16] Spanish Survey on Alcohol and Drugs (EDADES);[17] while other national surveys assessing sexual orientation focused mainly on sexual health, excluding tobacco use and other important health domains.[18,19] The most recent national surveys included information on the gender of those living with the respondent which, like other studies,[20] may be used as a proxy for sexual orientation. Therefore, the aim of this study is to analyse the two most recent Spanish national surveys to assess the association between active and passive tobacco use and living with same sex partners (SSP).

Methods

Design

This study used data from two national population surveys namely the 2011-Spanish National Health Survey (ENSE) and the 2014-European Health Interview Survey in Spain (EESE). Both studies were cross-sectional surveys of the general noninstitutionalized adult population (15 years or older) reached through household interviews. The reasons for analysing both samples were because of their similar methodologies and because, contrary to previous versions of the survey, the household interview obtained household information that could be used as proxy for sexual orientation.

Sample and procedure

Both surveys used similar methodology and were conducted by the Spanish National Institute of Statistics (INE: http://www.ine.es/). A detailed description of the methodology for both projects has been previously published.[15,16] A three-stage sampling design was used to obtain nationally representative samples. Stages were census tracts, households and the respondent. Interviews were conducted face-to-face at respondents' homes using Computer-Assisted Personal Interviewing (CAPI). Fieldwork was conducted from July-2011 to June-2012 (ENSE) and January-2014 to January-2015 (EESE). De-identified databases are available publicly online at https://www.msssi.gob.es/estadisticas/microdatos.do. Given that this investigation used de-identified public-use databases, it was not necessary to obtain the approval of an ethics committee according to Spanish legislation.

The total sample sizes were 21,007 and 22,842 for ENSE and EESE. Response rates were 61% and 71%, respectively. Information was collected on behalf of proxy respondents when selected respondents were hospitalized, unable to respond due to a severe condition or language barriers. Only respondents living with their partner were included in the final sample. The final sample size was 24,052 participants living with their partners, 11,562 from the 2011 ENSE and 12490 from the EESE. Among the participants, 90 lived with a SSP (21 women and 25 men from the 2011 and 19 women and 25 men from the 2014 surveys).

Measures

1) Living with same or opposite sex partners

Both surveys included information on the gender and relationship of those living with the respondent of the adult survey. Therefore, men who lived with male spouses or partners and women who lived with female spouses or partners were considered living with SSP whereas women or men who lived with spouses or partners of the opposite sex were considered living with opposite sex partners (OSP).

2) Smoking

Active smoking was assessed with the question "Could you please tell me if you smoke?" with four response options: a) yes, daily; b) yes, non-daily; c) no, but I smoked in the past; and d) no, and I have never smoked on a regular basis. Categories were clustered into 0 (no; c and d) and 1 (yes; a and b). Passive smoking was assessed differently in both surveys keeping the same question stem (how frequently are you exposed to...) and response options (never or almost never, less than an hour a day, from one to five hours a day and more than five hours a day). However, the ENSE asked three questions and the ENSE only one. The ENSE asked questions related to settings including home, public indoor spaces/transportation and indoor work spaces. Categories were clustered into 0 (no; never or almost never in all three items) and 1 (yes; at least less than one hour a day in any of the three items). The EESE asked only one question about indoor spaces. Categories were clustered into 0 (no; never or almost never) and 1 (yes; at least less than one hour a day). The reason for dichotomising the outcomes was the small sample of people living with SSP and that there is no safe level of smoking.[21]

3) Sociodemographic and variables related to tobacco use

Both surveys gathered standardised socio-demographic information including age, gender, education level, marital status, nationality and social class of the person who provided the highest income of the household. Education level of the individual was collapsed into three categories: primary or less (cannot read or write, incomplete and complete primary), secondary (first and second phases of secondary school and early technical school) and tertiary education (late technical school and university). Social class was gathered from the person in the household who provided the highest income and grouped using the 2011 Spanish National Classification of Occupations.[22] Other variables related to tobacco use[7,23] included in both surveys were the frequency of consumption of five or six (depending on the gender) standard units of alcohol in the past 12 months or whether they had ever had depression, chronic anxiety or other mental disorders.[15,16]

Statistical methods

Descriptive analyses included percentages and frequencies. Given the small sample of people living with SSP, descriptive statistics only stratified for gender in the main outcomes (active and passive smoking). Chi-square tests were used for bivariate associations. Multiple logistic regressions (odds ratio [OR], 95% confidence interval [95% CI]) were used for adjusted associations. Adjusted

associations controlled for potential confounders, namely gender, age (continuous), and social class. The choice of these sociodemographic variables was based on the literature.[24] Social class was included rather than level of education given that the level of education is partly implicit within the social class categories. Associations were also stratified by gender. Analyses were conducted for each survey and for a sample that was the result of the combination of both surveys. Both samples were combined to increase the sample size of people living with a SSP and therefore decrease the margin of error. Standard guidelines were followed to analyse the combined dataset with samples from 2011 and 2014.[25] The combination of both datasets was possible as they used the same methodology. Data were weighted to account for sampling design. For the combined dataset, new weights were calculated by computing the mean of the weights for both surveys. The level of statistical significance for all analyses was set at 0.05. Imputations for missing data were not used. All analyses were performed using the SPSS version 22.0 using complex samples analyses.[26]

Results

In the combined sample, there was a higher percentage of participants living with a SSP compared to an OSP who were younger, not married (36.4% *vs* 8.6%), non-nationals (21.6% *vs* 10.9%), had higher levels of education (43.2% *vs* 25.0% for tertiary education), belonged to a higher social class (53.5% *vs* 25.5% for class 1), were current active (53.5% *vs* 25.5%) and passive smokers (37.2% *vs* 16.0%) and binge drinkers (15.7% *vs* 7.1%) (Table 1).

Table 2 shows the adjusted associations of living with a SSP with current active and passive smoking controlling for age, gender and social class. In the combined sample, people living with a SSP had 2.71 (95%CI: 1.62-4.52) and 2.88 (95%CI: 1.74-4.79) higher odds of being current active and passive smokers respectively. When stratifying by gender, women living with a SSP had 4.54 (95%CI: 2.20-9.40) and 4.00 (95%CI: 1.88-8.49) higher odds of being current active and passive smokers compared to women living with an OSP. However, the association with active smoking was not statistically significant (OR: 1.86; 95%CI: 0.94-3.70) among SSP men. Men living with SSP had 2.20 (95%CI: 1.10-4.43) higher odds of being current passive smokers compared to men living with OSP. When analysing the separate surveys, women living with SSP were consistently more likely to be current active and passive smokers, whereas their male counterparts were only more likely to be passive smokers in the 2014 survey.

Discussion

To our knowledge, this is the first attempt to examine the association between living with a SSP and smoking at the national level in Spain. A strength of this study is that we used a sample from surveys representative of the Spanish population. We found that compared to people living with OSP, those living with SSP were more likely to be current active and passive smokers. We also found that the association between current smoking and living with a SSP is especially strong among women living with SSP, as they are about four times more likely to be current active and passive smokers than women living with OSP.

With some exceptions, the association between sexual minorities and cigarette smoking is widely established in the USA, but evidence is lacking elsewhere.[5,10] Associations found in this manuscript resemble those found among adults attracted for people the same sex in Barcelona.[13] The prevalence of smoking found in this study is also similar to the prevalence found in the 2010 EMIS in Spain.[11] Results from this study are in line with findings from a recent review showing that the association between sexual minorities and smoking is stronger among women.[10] Our findings are particularly similar to findings from the 2003–2010 National Health and Nutrition Examination Surveys in which associations between sexual orientation and different outcomes of active smoking were only found among lesbians and associations with passive smoking were stronger in this group too.[8] Stronger associations between passive smoking and women living with a SSP suggest that the social network of women living with a SSP might be more likely to be formed by smokers. Evidence shows that smoking by social network members is linked to higher rates of smoking and lower rates of cessation.[27,28] The findings showing the higher prevalence of passive smoking among adults living with SSP are consistent with data from the USA National Longitudinal Study of Adolescent Health in which same-sex-attracted youth had a higher frequency of tobacco use in their peer networks than did opposite-sex-attracted youth.[29]

Demographic characteristics including the younger age and higher percentage of non-nationals among adults living with SSP are consistent with results from the 2011 Spanish census.[30] Younger cohorts might be more likely to live together due to an increasingly higher acceptance of same sex relationships, especially on behalf of people their generation. For example, a survey conducted in 39 countries, found that the view that homosexuality should be accepted by society increased in Spain from 82% in 2007 to 88% in 2013.[31] Results from this study also found that younger groups had more tolerant views. The favourable conditions of Spain both in legal and tolerance terms might increase immigration of SSP from other countries.[31,32]

This study has some limitations. First, we only included participants living with their partner. Previous studies have used this approach as a proxy for sexual orientation in population surveys.[20] This approach fails to include respondents not living with a partner and is insensitive to bisexuality or other reasons for being in a relationship. People living with SSP might be less likely to disclose such information leading to lower associations. Second, transgender people were not included in the study. Third, the institutionalized population was excluded which might have a different smoking prevalence. Fourth, all measures were self-reported. Measurement of active and passive smoking was one of the many aims of the two surveys, and therefore, using biomarkers such as carbon monoxide would have been impractical. Fifth, causality may not be inferred given the cross-sectional design. Sixth, possible non-response bias should be taken into account given that response rates were 61% and 71% in the 2011 and 2014 surveys. Seventh, the sample size of people living with SSP was small despite combining samples from the two surveys affecting statistical power. The consequence of this small sample size of people living with SSP is that estimates for this group have relatively large margins of error.[33] Therefore, the sample is useful and a good first approach, but far from ideal, for the purpose of studying sexual minorities. Moreover, the small sample size does not allow meaningful analysis of subgroups based on sociodemographic or other characteristics.

Research is needed to ascertain the mechanisms explaining the association between sexual orientation and smoking including longitudinal studies, mediation analysis and research on exposure of LGBT people to tobacco industry campaigns. Spain and other countries need to include items on different domains of sexual orientation (behaviour, attraction and identity) in national adult and youth surveys to improve health disparities monitoring and to implement policies and interventions accordingly. Several methods have been suggested to decrease reluctance of some LGBT participants to identify themselves to researchers and to obtain quality samples with relatively small populations.[33] A particularly interesting approach is oversampling sexual minorities in population surveys to allow richer analyses. Meanwhile, countries

Table 1
Socio-demographic characteristics of the samples from the 2011 ENSE, 2014 EESE and the combination of both by living with a same or opposite sex partner.

	2011 ENSE, n = 11,562 n (%)		2014 EESE, n = 12,490 n (%)		2011 ENSE + 2014 EESE, n = 24,052 n (%)	
	Same sex, n = 46	Opposite sex, n = 11,516	Same sex, n = 44	Opposite sex, n = 12,446	Same sex, n = 90	Opposite sex, n = 23,962
Age, years[a,b,c]						
17-29	6 (11.2)	510 (5.6)	6 (20.1)	436 (4.7)	12 (15.9)	946 (5.1)
30-39	20 (42.4)	2,351 (22.2)	16 (38.8)	2,357 (21.0)	36 (40.5)	4,708 (21.6)
40-49	9 (20.1)	2,557 (23.6)	10 (15.1)	2,952 (24.3)	19 (17.5)	5,509 (24.0)
50-59	6 (16.1)	2,207 (19.7)	9 (20.3)	2,449 (20.4)	15 (18.3)	4,656 (20.0)
60+	5 (10.1)	3,891 (28.9)	3 (5.7)	4,252 (29.6)	8 (7.8)	8,143 (29.3)
Gender						
Women	21 (43.8)	5,760 (49.2)	19 (40.5)	6,072 (48.4)	40 (42.0)	11,832 (48.8)
Men	25 (56.2)	5,756 (50.8)	25 (59.5)	6,374 (51.6)	50 (58.0)	12,130 (51.2)
Marital status[a,b,c]						
Single	17 (36.0)	878 (8.7)	13 (29.1)	582 (5.5)	30 (32.4)	1,454 (7.0)
Married	27 (61.3)	10,439 (89.5)	28 (65.7)	11,719 (93.2)	55 (63.6)	22,158 (91.4)
Widowed	1 (0.5)	45 (0.4)	0 (0.0)	22 (0.2)	1 (0.2)	67 (0.3)
Legally separated	1 (2.2)	54 (0.5)	0 (0.0)	34 (0.3)	1 (1.0)	88 (0.4)
Divorced	0 (0.0)	102 (0.9)	3 (5.3)	86 (0.7)	3 (2.8)	188 (0.8)
No Spanish nationality[b,c]	4 (15.5)	730 (12.1)	7 (27.2)	710 (9.9)	11 (21.6)	1,440 (10.9)
Education[a,b,c]						
Primary or less	2 (4.1)	2,795 (21.8)	2 (5.3)	4,111 (31.0)	4 (4.7)	6,906 (26.6)
Secondary	24 (50.2)	6,220 (56.2)	21 (53.8)	4,852 (41.2)	45 (52.1)	11,072 (48.4)
Tertiary	20 (45.7)	2,501 (22.0)	21 (41.0)	3,483 (27.8)	41 (43.2)	5,984 (25.0)
Social class[b,c]						
I	10 (23.3)	1,308 (11.5)	8 (17.7)	1,521 (12.2)	18 (20.3)	2,829 (11.9)
II	6 (11.2)	921 (7.9)	9 (19.7)	1,070 (8.5)	15 (15.6)	1,991 (8.2)
III	9 (18.5)	2,148 (18.5)	11 (25.1)	2,395 (19.4)	20 (22.0)	4,543 (19.0)
IV	7 (18.1)	1,914 (17.1)	5 (8.3)	2,094 (16.4)	12 (12.9)	4,008 (16.7)
V	9 (17.3)	3,724 (32.6)	11 (29.3)	3,903 (31.3)	20 (23.6)	7,627 (31.9)
VI	4 (11.8)	1,338 (12.5)	0 (0.0)	1,360 (12.2)	4 (5.6)	2,698 (12.3)
Active smoking[a,b,c]	21 (47.7)	2,868 (26.4)	23 (58.8)	2,902 (24.6)	44 (53.5)	5,770 (25.5)
Women[a,b,c]	13 (59.5)	1,221 (22.7)	9 (61.5)	1,222 (20.8)	22 (60.5)	2,443 (21.7)
Men[b,c]	8 (38.5)	1,647 (30.1)	14 (57.0)	1,680 (28.2)	22 (48.5)	3,327 (29.1)
Passive smoking[b,c]	13 (29.7)	1,986 (18.7)	17 (44.0)	1,496 (13.4)	30 (37.2)	3,482 (16.0)
Women[a,b,c]	9 (41.7)	1,009 (18.8)	7 (46.0)	741 (13.5)	16 (43.9)	1,750 (16.1)
Men[b,c]	4 (20.4)	977 (18.6)	10 (42.7)	755 (13.4)	14 (32.4)	1,732 (15.8)
Binge drinking at least once a month[a,c]	5 (12.4)	369 (3.9)	6 (19.3)	900 (10.5)	11 (15.7)	1,269 (7.1)
Ever had						
Depression	3 (6.4)	955 (7.6)	3 (6.5)	1,218 (9.5)	6 (6.5)	2,173 (8.6)
Chronic anxiety	3 (6.0)	1,017 (8.7)	3 (6.4)	1,082 (8.7)	6 (6.2)	2,099 (8.7)
Other mental diseases	0 (0.0)	124 (1.0)	0 (0.0)	151 (1.2)	0 (0.0)	275 (1.1)

[a] χ^2 test: association between variable and living in a same sex relationship significant at the 0.05 level in a 2011 ENSE sample.
[b] χ^2 test: association between variable and living in a same sex relationship significant at the 0.05 level in a 2014 EESE sample.
[c] χ^2 test: association between variable and living in a same sex relationship significant at the 0.05 level in a combined sample.

Table 2
Multiple logistic regression showing associations (coefficient, 95% confidence interval) with living with a same sex partner on active and passive smoking by gender and survey. Associations adjusted for age (continuous), gender and social class of person who provides the highest income in the household.

Survey	Outcome	SSP women		SSP men		SSP women and men	
		OR	95%CI	OR	95%CI	OR	95%CI
2011 ENSE	Active smoking	4.40[a]	1.63-11.85	1.25	0.47-3.35	2.14[a]	1.09-4.21
	Passive smoking	3.14[a]	1.20-8.24	1.05	0.34-3.22	1.78	0.88-3.60
2014 EESE	Active smoking	4.85[a]	1.70-13.83	2.70	0.98-7.43	3.49[a]	1.63-7.48
	Passive smoking	5.23[a]	1.67-16.37	4.03[a]	1.56-10.40	4.56[a]	2.21-9.44
2011 ENSE + 2014 EESE	Active smoking	4.54[a]	2.20-9.40	1.86	0.94-3.70	2.71[a]	1.62-4.52
	Passive smoking	4.00[a]	1.88-8.49	2.20[a]	1.10-4.43	2.88[a]	1.74-4.79

95%CI: 95% confidence interval; OR: odds ratio; SSP: same sex partner.
[a] Association significant at the 0.05 level.

conducting surveys that gather data on the household members' gender and their relation to the respondent may conduct analyses like the present study. Tobacco control strategies including raising tobacco taxes should be combined with efforts to tackle disparities among sexual minority populations including prevention of discrimination and homophobia or prevention of targeting by the tobacco industry and anti-tobacco campaigns in the general and LGBT media.[5,34] Anti-tobacco messages should include the harms caused by second hand smoke to themselves, to their family, friends and other people around them and take into account the potential

role of gender.[9] The high association between people living with a SSP and passive smoking suggests that prevention and smoking cessation efforts addressed at same-sex couples might be especially effective. This approach is similar to approaches suggested to prevent sexually transmitted infections among stable same-sex couples.[35]

Conclusion

We found that current active and passive smoking were more prevalent among Spanish adults living with SSP compared to those living with OSP. Associations were especially strong among women living with SSP. The Spanish government should make further efforts to monitor and implement initiatives to improve the health of sexual minorities as part of their plans to tackle health disparities.

What is known about the topic?

Several studies show that smoking is more prevalent among sexual minorities. Most of these studies come from the United States of America. Some Spanish national surveys include key information in their household section that may be used as a proxy for sexual orientation.

What does this study add to the literature?

This is the first study to examine the association between living with a same sex partner and smoking at the national level in Spain. The present study has found that Spanish adults living with same sex partners are at higher risk of active and passive smoking, especially women.

Editor in charge

Carlos Álvarez Dardet.

Transparency declaration

The corresponding author on behalf of the other authors guarantee the accuracy, transparency and honesty of the data and information contained in the study, that no relevant information has been omitted and that all discrepancies between authors have been adequately resolved and described.

Authorship contributions

J. Perales was involved in the conception and design of the work and carried out the analysis. J. Perales, I. Checa and B. Espejo were involved in the interpretation of data. The first version of the manuscript was written by J. Perales and was subsequently improved by I. Checa and B. Espejo, with important intellectual contributions. All authors have approved the final version and are jointly responsible for adequate revision and discussion of all aspects included in the manuscript.

Acknowledgments

J. Perales is grateful to his mentors at KUMC for giving him the opportunity to learn about tobacco-related disparities. J. Perales would like to thank Maica Rodríguez and the Spanish National Institute of Statistics (INE) for their statistical advice, and to Emma Green for her assistance with language. The authors are grateful to the people and organizations involved in the 2011 ENSE and 2014 EESE.

Funding

None.

Conflicts of interest

None.

References

1. Banegas JR, Díez-Gañán L, Banuelos-Marco B, et al. [Smoking-attributable deaths in Spain, 2006]. Med Clin. 2011;136:97–102.
2. World Health Organization. Country statistics and global health estimates: Spain. 2015. Geneva: World Health Organization [consultado 6 May 2017]. Disponible en: http://www.who.int/gho/countries/esp.pdf?ua=1
3. González-Enríquez J, Salvador-Llivina T, López-Nicolas A, et al. [The effects of implementing a smoking cessation intervention in Spain on morbidity, mortality and health care costs]. Gac Sanit. 2002;16:308–17.
4. Blosnich J, Lee JG, Horn K. A systematic review of the aetiology of tobacco disparities for sexual minorities. Tob Control. 2013;22:66–73.
5. Lee JG, Griffin GK, Melvin CL. Tobacco use among sexual minorities in the USA, 1987 to May 2007: a systematic review. Tob Control. 2009;18:275–82.
6. Pelster ADK, Fisher CM, Irwin JA, et al. Tobacco use and its relationship to social determinants of health in LGBT populations of a Midwestern State. LGBT Health. 2015;2:71–6.
7. Lawrence D, Mitrou F, Zubrick SR. Smoking and mental illness: results from population surveys in Australia and the United States. BMC Public Health. 2009;9:285.
8. Cochran SD, Bandiera FC, Mays VM. Sexual orientation-related differences in tobacco use and secondhand smoke exposure among US adults aged 20 to 59 years: 2003-2010 National Health and Nutrition Examination Surveys. Am J Public Health. 2013;103:1837–44.
9. Öberg M, Jaakkola MS, Woodward A, et al. Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries. Lancet. 2011;377:139–46.
10. Bravo A, Cabrera MC, Gómez LF, et al. [Tobacco consumption in stigmatized populations: a PubMed tobacco literature review on stigmatized populations.] Revista Colombiana de Neumología. 2015:27.
11. Ministerio de Sanidad, Servicios Sociales e Igualdad. [Men-Who-Have-Sex-With-Men Internet Survey (EMIS): results in Spain.] Madrid: MSSSI; 2013.
12. World Health Organization. WHO global report on trends in prevalence of tobacco smoking 2015. 2015. Geneva: World Health Organization [consultado 6 May 2017]. Disponible en: http://apps.who.int/iris/bitstream/10665/156262/1/9789241564922_eng.pdf
13. Pérez G, Martí-Pastor M, Gotsens M, et al. [Health and health-related behaviors according to sexual attraction and behavior]. Gac Sanit. 2015;29:135–8.
14. Requena ML, Suárez M, Pérez O. [Current situation of health surveys in Spain]. Rev Esp Salud Pública. 2013;87:549–73.
15. Ministerio de Igualdad y Servicios Sociales; Instituto Nacional de Estadística. 2011-2012. [National Health Survey: methodology]. Madrid: MISS: 2011.
16. Instituto Nacional de Estadística. [2014 European Health Interview Survey in Spain: Methodology]. Madrid: INE; 2014.
17. Ministerio de Sanidad, Servicios Sociales e Igualdad. [2013 Household Survey on Alcohol and Drugs in the general population in Spain (EDADES)]. Madrid: MSSSI; 2013.
18. Ministerio de Sanidad, Política Social e Igualdad, Observatorio de Salud de las Mujeres. [2009 Sexual Health National Survey]. Madrid; 2009.
19. Suárez M, Belza M, de La Fuente L, et al. [2003 Health and Sexual Habits Survey. General report]. Madrid: Instituto Nacional de Estadística y Ministerio de Sanidad y Consumo; 2006.
20. Heck JE, Jacobson JS. Asthma diagnosis among individuals in same-sex relationships. J Asthma. 2006;43:579–84.
21. Schane RE, Ling PM, Glantz SA. Health effects of light and intermittent smoking: a review. Circulation. 2010;121:1518–22.
22. Domingo-Salvany A, Bacigalupe A, Carrasco JM, et al. [Proposals for social class classification based on the Spanish National Classification of Occupations 2011 using neo-Weberian and neo-Marxist approaches]. Gac Sanit. 2013;27:263–72.
23. Humfleet G, Muñoz R, Sees K, et al. History of alcohol or drug problems, current use of alcohol or marijuana, and success in quitting smoking. Addict Behav. 1999;24:149–54.
24. 2008 PHS Guideline Update Panel, Liaisons, and Staff. Treating tobacco use and dependence: 2008 update U.S. Public Health Service Clinical Practice Guideline executive summary. Respir Care. 2008;53:1217–22.
25. Wendt M. Considerations before pooling data from two different cycles of the General Social Survey. Ottawa: Social and Aboriginal Statistics Division, Statistics Canada; 2007. p. 1–17.
26. IBM, Corp. Released 2013. IBM SPSS Statistics for Windows. Version 22.0. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp; 2013.

27. Unger JB, Chen X. The role of social networks and media receptivity in predicting age of smoking initiation: a proportional hazards model of risk and protective factors. Addict Behav. 1999;24:371–81.
28. Mills AL, Messer K, Gilpin EA, et al. The effect of smoke-free homes on adult smoking behavior: a review. Nicotine Tob Res. 2009;11:1131–41.
29. Hatzenbuehler ML, McLaughlin KA, Xuan Z. Social networks and sexual orientation disparities in tobacco and alcohol use. J Stud Alcohol Drugs. 2015;76:117–26.
30. Cortina C. [Demographics of homosexual couples in Spain]. Revista Española de Investigaciones Sociológicas (REIS). 2016;153:3–21.
31. Kohut A, Wike R, Bell J, et al. The global divide on homosexuality. Pew Research Center. 2013. June.
32. Ley 13/2005, por la que se modifica el Código Civil en materia de derecho a contraer matrimonio. Boletín Oficial del Estado. 1 de julio, 2005.
33. Graham R, Berkowitz B, Blum R, et al. The health of lesbian, gay, bisexual, and transgender people: building a foundation for better understanding. Washington, DC: Institute of Medicine; 2011. p. 89–139.
34. Mayer KH, Bradford JB, Makadon HJ, et al. Sexual and gender minority health: what we know and what needs to be done. Am J Public Health. 2008;98:989–95.
35. Folch C, Casabona J, Muñoz R, et al. [Trends in the prevalence of HIV infection and risk behaviors in homo- and bisexual men]. Gac Sanit. 2005;19:294–301.