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Is low educated women's health worsening faster than other educational groups? Results from Catalonia (Spain)

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Abstract

Background: Health expectancies vary worldwide according to socioeconomic status (SES). The lower SES usually show health disadvantage and the higher SES a health advantage compared to the average. The educational level of individuals is strongly linked to their SES.

Objective: We propose to identify the evolution of SES differentials in health by gender, paying special attention to the trends for females. We focus on the Catalan population (Spain), aged 55 or older.

Methods: We used individual cross-sectional data obtained in 1994 and in 2012 from the Catalan Health Survey. We examined three comprehensive health indicators to disentangle the health and disability statuses in order to document social differences in health. We applied logistic models for each indicator, controlling for socio-demographic characteristics, living arrangements and health behaviors.

Results: Low educated, particularly females, suffered significant increments in the prevalences of functional and daily living limitations between 1994 and 2012. Higher educated individuals widened their health differences with the less advantaged groups. Behaviors such as smoking, drinking or sedentarism were associated with higher probabilities of bad self-perceived health and functional limitations.

Conclusions: Health policies should take into account that the population with lower SES is more likely to suffer from poor health and disability as they age. Lower educated females are more vulnerable than males. Adopting a lifestyle based on avoiding sedentarism, excessive drinking and smoking promotes health and personal autonomy.

Introduction

The remarkable gains in longevity in Europe in recent history raise a number of questions about the impacts on health and the quality of life of older individuals. Europeans live longer and beyond their working years, and spend decades in retirement, but a significant part of their life expectancy is lived with diseases and disability (Solé-Auró and Alcañiz, 2014). Large variations in health expectancies according to socioeconomic status (SES) are observed across and within Europe (Crimmins et al, 2003, Maje et al 2011; Mäki et al. 2013) and in the United States (Solé-Auró et al. 2014; Meara et al., 2008). These variations provoke an important health concern that should promote the reduction of health differentials and the increase of healthy active aging in Europe (Jagger at al., 2013; Rechel et al., 2013; Marmot et al., 2008; Mackenbach et al., 2008).

Health and aging of the population

Aging is gratifying but there are a number of components involved across our lifespan that modify our vital trajectory from birth to death. These cause the body to slowly degrade both at functional and at cellular level. The sizeable gains in life expectancy have led to more severe differences in the way old people face the last stage of life. As Aureli and Baldazzi (2002) pointed out individual's "registered age" and "biological age", the real age of their body, no longer coincide. Education is one of the most determinant leading factors in the way of approaching old age, as the more educated opt for new commitments and innovative resources more than the least educated. Moreover, individual's lifestyle, perceived health and sociodemographic characteristics, such as professional status, income or household, have been found to be predictors of adjustment to aging (Von Humboldt et al., 2014). There are other indicators, such us preserving vision or the ability to perform activities (or instrumental activities) of daily living that are not essential for functioning but allow individuals to live

independently in a community and directly correlate to successful aging and a good valuation of old age (Jopp et al., 2008).

Socio-economic differences in health: the European context

We know that women live longer and spend more years with health problems than men. But, is *low educated women's health worsening faster than other educational groups*? There is not a clear answer to this question.

Evidence from Northern European countries show that a high SES is closely linked to healthy behaviors, which enhance a longer life expectancy. Nevertheless, in Central and Southern Europe issues regarding culture and lifestyle seem to be more related than socioeconomic variables to risk factors such as smoking, physical inactivity or high body mass index (BMI) (Mäki et al, 2014). Material factors, such us financial problems, income or employment status are also important on succesful aging. For instance, analyzing Dutch data, Schrijvers et al. (1999) suggested that the relation between educational level and mortality is deeply founded not only in behavioral factors, but also on material factors.

When we look at the Southern Spanish population with lower levels of education, Morales-Asencio et al. (2012) found out an inverse gradient of cardiovascular risk factors and level of education, concluding that low educated people had higher prevalences of increased BMI and physical inactivity, associated with hypertension and hence a higher risk of cardiovascular disease.

Methodology

Data

We used data obtained between 1994 and 2012 from the Catalan Health Survey (ESCA) (Generalitat de Catalunya 2013). The Department of Health in Catalonia (Spain) – a highly populated Mediterranean region located in the northeast corner of the Iberian Peninsula – is responsible for the technical execution of this official survey. The ESCA is the only source of micro data for Catalonia, containing information on socio-demographic variables, health behaviors and individual's state of health. The sample follows a stratified design, based on age, gender and geographical area. The random collection of the data is performed using personal interviews. The questionnaires of each time-period are designed to be comparable.

This cross-sectional survey was collected in 1994 and continuously during the period 2010 to 2014 (Alcañiz et al. 2014). In the last time period we combined data of the last four year's available (last semester of 2010, 2011, 2012, 2013 and the first semester of 2014) to increase our sample size, and considered 2012 our midpoint year. Hence, when we refer to the year 2012 in our analysis, we include data from the years 2010 to 2014. As the aim of this study is to examine trends in SES differentials by gender when health problems start to show in the population, we focus on respondents who were 55 years of age and older. Our sample is comprised of 10,307 Catalan non-institutionalized residents (4,446 individuals in 1994 and 5,861 individuals in 2012) randomly selected aged 55 years and older.

Measures

Conceptual health framework

Health is difficult to define and operationalize because it is a multidimensional concept. Mainly, health can be defined in terms of morbidity, functional health and subjective health (Cambois et al., 2011). These various health dimensions describe a process from disease to disability and death, well-known as the disablement process (Verbrugge and Jette, 1994). The disablement process depends in part on the individual's resources (income, double health

coverage,…) and environmental factors (physical, intellectual, social, behavioral,…) to maintain persons activity. Therefore, we can examine different health transitions across the process.

Indicators

We use three health indicators to disentangle the health and disability statuses in order to document social differences in health. These health measures are based on the conceptual framework of the disablement process: 1) *Self-perceived health*: we consider persons reporting being in bad or very bad health, as opposed to those who report being in excellent, very good or good health; 2) *Physical and sensory functional limitations:* our indicator of functional limitations is based on a positive answer (yes versus no) – reporting difficulty in at least one of following five items: (i) limitations in seeing; (ii) limitations in hearing; (iii) mobility problems, such as the inability to move out of the house without receiving help from another person; (iv) walking problems, which may require using special equipment; and (v) other important mobility limitations, such as the difficulty to walk up and down a flight of stairs, and standing without using special equipment. Our last health measure is the restrictions on *activities of daily living (ADL)* (difficulty in or need of assistance for eating, washing, getting dressed or toileting). ADL limitations, a more severe indicator, is usually located at the end of life in the disablement process.

Socio-economic status was measured by education, as the level of education is relatively well reported and stays constant throughout adult life for most people. Importantly, it is less likely to be reverse causation between education and health at older ages than with other measures of socio-economic status such as income, wealth or occupation. We consider three educational groups based on the level of education achieved, using the International Standard Classification of Education (ISCED): 0-2 for the low-educated (primary and lower secondary

education), 3-4 for the middle-educated (upper secondary education) and 5-6 for the high-educated (tertiary education). In the regression material, we include marital status as a dichotomous variable (married versus not); self-reported smoking behavior with three categories (non-smoker, past or current smoker); and the alcohol intake differentiating between at risk drinkers, and moderate or non-drinkers, according to the classification provided by the Spanish Society of Family and Community Medicine (Robledo and Córdoba, 2005). Sedentery lifestyle reports individuals with no regular physical activity versus people that have some. Spain provides universal public coverage, but can be voluntarily complemented through private health insurance. Thus, we also include controls for double health coverage.

Analyses

Prevalence

We examine descriptive data on prevalence of good self-perceived health, functional limitations (sensory plus mobility) and ADL difficulties for individuals aged 55-plus by gender, documenting differences in the prevalences of these health indicators. We have standarized our samples to make comparisions in both periods, so that each population has the same age structure that the whole 2012 national population. Thus, the differences in our indicators due to a different demographic structure between 1994 and 2012 is eliminated.

Logistic regression

We applied a logistic regression model in each time period to examine trends in SES differentials by gender for three outcomes. Model 1 examines the effect on having selected health and disability indicators for each outcome controlling for age, sex, level of education (Table 2). Model 2 adds an interaction between sex and educational level. Finally, in Model 3 we introduce the marital status and double health coverage, and control by unhealthy

behaviors such us smoking (current or past), excessive drinking and sedentarism (data not shown yet for ADL limitations). Analyses are weighted using sample weights provided in both years. Analyses are conducted using Stata software, version 12 (StataCorp).

Results

Table 1 presents the sample characteristics for those aged 55-plus in 1994 and in 2012 by sex. The educational distribution across the two time periods has drawn a different picture across generations. In 1994, a higher proportion of males and females belonged to the low educated group (88.5% and 94.4%, respectively); however, the low-educated have been greatly reduced in 2012 (67.8% and 74.6%, respectively). The middle educated group experienced a large increase over time for both genders. Even thought the high educated population represented a minority all along the period, percentages increased from 4.8% and 2.0% in 1994, to 11.3% and 7.2% in 2012, for males and females, respectively.

We also document differences in the prevalence of three health indicators by education using the cross-sectional data in 1994 and in 2012. Low educated women showed moderate increments of physical and sensory functional limitations over time, although the greater concern is an increase of almost 9% in the prevalence of ADL limitations, much higher than the variations observed for the middle and high educated groups. Also for the low educated, the increments of functional limiations for men are greater than for women, and for ADL restrictions more than double for both males and females over time. The perception of bad health has reduced over time for men and women. Both males and females in the middle educated group experienced a worse perception of their health status between 1994 and 2012. Moreover, the increment of this bad health perception is accompanied by increments on functional limitations and ADL restrictions. Again, both most educated men and women experiented a reduction of their bad health perceived health over time. However, high-

educated women experienced increments on both functional limitations and ADL restrictions. As expected, most health and disability prevalences diminish from low to high educational groups; the more educated the least health or disability problems.

[Insert Table 1 about here]

Table 2 shows the odds ratio of the explanatory variables indicating the effect on having fair or poor self-perceived health, functional limitations and ADL limitations. There are three models: model 1 controls for age, being female and level of education (low or high); model 2 adds the interacted term between sex and education; and model 3 controls for health behaviors controls. As expected, age and being female is significantly associated to all health and disability variables in 1994 and 2012, except for adl limitations in 1994. Having low education significantly increases the effect on having fair or poor self-perceived health and functional limitations in both years; however, having higher education significantly reduces the probability of these two health conditions only in 2012. The effects on ADL limitations are somehow different. In 1994, being older is significant; by 2012 age, being older and being female is positively associated on having ADL limitations, but having a low education is not anymore significant when controls for health behaviors are added.

[Insert Table 2 about here]

Conclusions

There are some limitations in the present analysis that could affect our findings. The meaning of education might have changed between our time interval, as well as the health return of education. The investigation of socioeconomic differences in health would provide clarity exploiting the longitudinal nature of the datasets, but no panel data for Catalonia or Spain are available.

Health policies should take into account that the population with lower SES is more likely to suffer from poor health and disability as they age. Lower educated females are more vulnerable than males. Adopting a lifestyle based on avoiding sedentarism, excessive drinking and smoking promotes health and personal autonomy.

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Table 1: Sample characteristics by sex in 1994 and 2012. Age-adjusted prevalence of health and disability indicators by gender

		Sample size and distribution				*Health and disability prevalences*					
		1994		2012		Bad Self-perceived health		Functional limitations		ADL limitations	
		N	% weighted	N	% weighted	1994	2012	1994	2012	1994	2012
Men	Education										
	Low educated	1,746	88.5	1,873	67.8	43.9	41.1	26.9	36.1	3.9	10.2
	Middle educated	131	6.6	619	21.8	24.8	31.4	14.4	22.3	1.7	4.9
	High educated	96	4.8	322	11.3	23.4	19.2	17.5	19.6	2.3	4.5
	Married	1,646	83.3	2,219	78.8						
	Health behaviors										
	Current smoker	507	26.3	543	20.6						
	Past Smoker	787	42.6	1,121	43.0						
	Drinking	96	5.0	84	3.2						
	Sedentery lifestyle	472	25.4	802	30.9						
	Double health coverage	365	18.5	626	22.2						
	Total	1,973	-	2,814	-						
Women	Education										
	Low educated	2,335	94.4	2,343	74.6	56.3	50.6	37.7	41.4	4.9	13.8
	Middle educated	89	3.6	487	16.2	31.3	33.1	19.1	22.9	4.4	5.0
	High educated	49	2.0	217	7.2	32.8	26.5	16.2	20.0	2.0	4.0
	Married	1,429	58.3	1,697	56.0						
	Health behaviors										
	Current smoker	37	1.7	223	8.2						
	Past Smoker	46	2.0	287	10.4						
	Drinking	44	1.9	24	0.9						
	Sedentery lifestyle	707	30.1	905	32.3						
	Double health coverage	440	17.7	611	20.1						
	Total	2,473	-	3,047	-						

Source: ESCA 1994-2012

Table 2: Odds Ratio indicating effect on having selected health and disability indicators: 1994 and 2012. Individuals aged 55-plus

1994

Variables	Fair or Poor Self- perceived health			Functional limitations			ADL limitations		
	M1	M2	M3	M1	M2	M3	M1	M2	M3
Socio-demographic characteristics									
Age	1.01	1.01	1.00	1.08 ***	1.08 ***	1.06 ***	1.12 ***	1.13 ***	
Sex (female)	1.63 ***	1.33	1.63	1.55 ***	1.30	1.72	1.09	2.97	
Education									
Low Ed.	2.49 ***	2.24 ***	2.28 ***	2.14 ***	1.95 *	2.25 *	1.17	2.06	
High Ed.	0.91	0.41	0.69	1.00	0.90	0.95	0.87	1.38	
Education x Sex									
*Female*LowEducated*		1.24	1.31		1.20	1.02		0.35	
*Female*High educated*		1.20	1.81		1.27	1.43		0.46	
Married			1.30 **			1.14			
Health behaviors									
Current smoker			1.03			1.06			
Past Smoker			1.58 ***			1.19			
Drinking			0.44 **			0.33 **			
Sedentery lifestyle			2.26 ***			2.65 ***			
Double health coverage			0.72 ***			0.80 *			

2012

Variables	Fair or Poor Self- perceived health			Functional limitations			ADL limitations		
	M1	M2	M3	M1	M2	M3	M1	M2	M3
Socio-demographic characteristics									
Age	1.03 ***	1.03 ***	1.01 ***	1.09 ***	1.09 ***	1.07 ***	1.13 ***	1.13 ***	
Sex	1.47 ***	1.85 **	1.25	1.38 ***	1.15	1.29	1.47 ***	0.92	
Education									
Low Ed.	1.50 ***	1.26 *	1.31 *	1.21 *	1.07	1.16	1.27	0.93	
High Ed.	0.59 ***	0.46 ***	0.44 ***	0.74 *	0.69 *	0.64 **	0.86	0.74	
Education x Sex									
*Female*LowEducated*		0.84	1.35 *		1.27	1.21		1.76	
*Female*High educated*		0.59 *	1.67 *		1.15	1.18		1.29	
Married			1.02			0.94			
Health behaviors									
Current smoker			0.99			0.86			
Past Smoker			1.19 *			1.28 **			
Drinking			1.00			1.40			
Sedentery lifestyle			2.73 ***			4.15 ***			
Double health coverage			0.79 **			0.92			

Source: ESCA 1994-2012