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Educational Level as a Determinant for Health: A Case Study of Portugal

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Education level can be considered as a proxy for socio-economic status and as a determinant for health and quality of life. The purpose of this research was to analyze the sensitivity of the SF-36 Health Survey to different education levels. The sample used was representative of the Portuguese working age adults between 18 and 64 years of age. 2459 individuals from 822 households were interviewed in both rural and urban areas of Portugal. As a result from this study it was evident that, in general, perceived health status declined with age. However, low education and being female have negative impact on the quality of life. People in low educational level show the lowest health status scores. On the other hand, the health dimensions with the highest standardized differences by education vary with age.

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Various authors consider education level as a good proxy for socio-economic status (19). Using this rationale, if the mortality between 18 and 74 years of age among the low educated individuals were the same as that of the educated ones, we should observe a substantial reduction of 40,000 deaths (3). It is commonly accepted that individuals with higher socio-economic deficits have higher mortality and higher frequency of health problems than those in higher socio-economic strata (1, 4, 5, 10, 11, 12). In Portugal, a study conduced in 1995 showed that women younger than 45 years old and living in rural areas, manual workers, low educated, and widows perceived their health status worse than men (15).

On the other hand, Latin countries like Portugal are characterized by having lower perceived health status than other countries (13). This is not exclusively explained by the absolute differences in nation's health status. Cultural issues and a subjective way of looking to themselves may be more relevant in explaining the differences in person's perceived health.

Portugal, a country placed in the 27th ranking in the United Nations socio-economic classification (16) and in the 24th health level ranking by the World Health Organization (19) is a good context to test the association between education level and personal health-related quality of life.

Several measures have been widely used to assess health-related quality of life, even at a population level. Sickness Impact Profile (2), Nottingham Health Profile (8) and the SF-36 Health Survey (17) are examples of instruments already translated and culturally validated to Portuguese. Among these, the SF-36 is perhaps the most used one in Portugal.

The main objective of this study was to analyse the sensitivity of the SF-36 Health Survey's health dimensions to different education levels in Portuguese working age adults.

Methods

The sampling universe was the Portuguese adults of working age between 18 and 64 years of age. Trained interviewers collected a representative sample of 2554 individuals corresponding to 822 households, in seven months. 850 households have been selected in urban and rural areas of Portugal main land, being 28 excluded after a second attempt to be interviewed with no one at home. At the end, the interviewed population corresponded to 96% of the anticipated contacts; refusals were more frequent in the urban areas. Concerning with its representativeness, statistical tests showed no significant differences between the general population census and the sample used in this study.

The measurement instrument used to assess subjects' perceptions of health status was the Portuguese version of the MOS SF-36 (6, 18). As described elsewhere (9), this questionnaire allows us to measure eight major multi-item health dimensions: physical function (PF), health limitations due to physical health problems (RP) or to emotional problems (RE), bodily pain (BP), general health (GH), vitality (VT), social function (SF) and mental health (MH). The scoring system used to obtain the dimensions as well as the procedures to handle missing values were the ones proposed by the authors. For operative reasons, age values were grouped into three categories (18-34 years, 35-54 years, and 55 years and older) and education scores were also divided into three groups (low education, middle education, and high education). Low education means unable to read or to write, or with an education at most equivalent to basic education; middle education is equivalent to secondary level; and high education encompasses the polytechnic and the university levels.

The comparing analyses were performed in men and women with respect to the highest education level. The internal consistency of the eight dimensions of the SF-36 in the age groups were very good, all of them above 0.70 except for social functioning dimension in female aged 25-44 years, which had the value of 0.63.

To compare, for each SF-36 dimension, the scores obtained in each education level, we used the effect sizes. These values were calculated by computing the absolute differences between each education level and the score corresponding to the highest education level, divided by the standard deviation of the whole population. Following some authors, an effect size of 0.2 is called a small difference, a value of 0.5 moderate one and a value of 0.8 a large difference (9).

Finally, ordinary least squares regression technique was used to explain the effect of education, age and gender in the SF-36 dimension scores. Dummy variables were

Table 1

Distribution of Men and Women by Age and Education Level

Education Level	Men			Women			Total		
	18-24	25-44	45+	18-24	25-44	45+	18-24	25-44	45+
Total	330	810	346	230	501	337	560	1311	683
High	36	70	25	19	38	24	55	108	49
Middle	252	252	35	164	208	57	416	460	92
Low	42	488	286	47	255	256	89	743	542

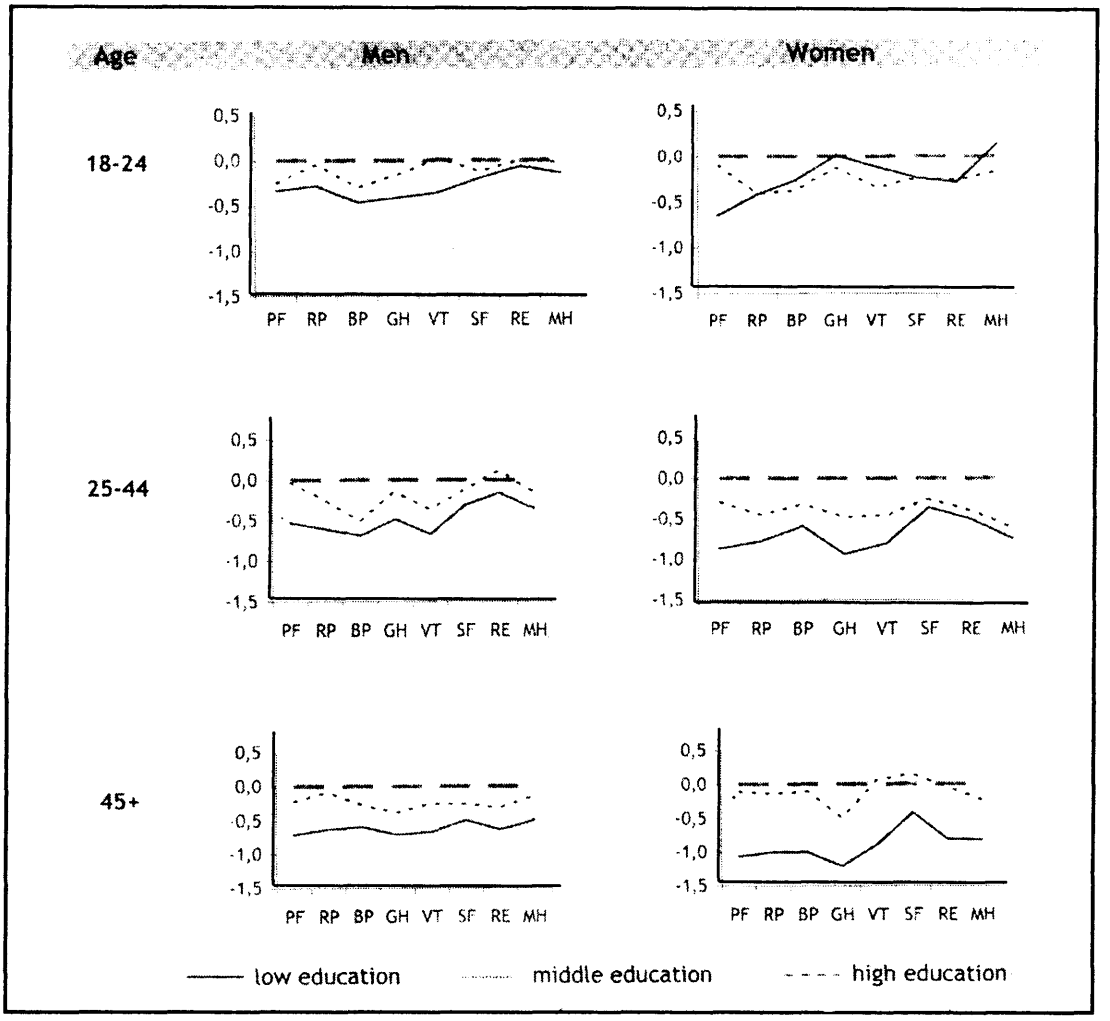

Fig. 1

Effect Sizes between High Education and the Other Education Levels

Table 2

Mean Scores of SF-36 Dimensions

Age	Men			Women		
	18-24	25-44	45+	18-24	25-44	45+
Physical functioning						
Whole population	86.1	79.4	73.4	84.2	71.2	61.5
High education	92.1	86.4	88.1	87.9	87.9	86.2
Middle education	86.0	85.8	82.5	85.6	80.0	83.3
Low education	84.0	73.1	70.1	72.7	64.2	56.6
Role physical						
Whole population	77.6	76.6	71.4	79.1	71.2	60.9
High education	79.6	86.5	83.8	86.4	86.3	84.5
Middle education	78.6	80.5	81.7	78.2	75.2	80.5
Low education	73.3	72.0	68.0	78.1	67.0	56.5
Bodily pain						
Whole population	75.5	69.7	62.6	68.5	57.3	49.6
High education	82.4	83.0	74.4	75.4	68.2	70.4
Middle education	75.7	70.8	67.7	67.3	60.5	67.8
Low education	72.1	66.5	60.3	69.8	54.1	45.5
General health						
Whole population	63.9	60.2	54.3	62.3	53.0	45.6
High education	67.4	65.5	65.0	63.9	65.7	66.2
Middle education	64.6	63.0	58.2	61.8	57.2	56.5
Low education	59.9	57.1	52.5	64.1	49.1	42.5
Vitality						
Whole population	67.8	64.1	58.6	60.1	52.6	43.9
High education	68.9	74.5	71.3	65.4	66.9	60.9
Middle education	69.3	66.8	65.4	58.8	56.6	62.4
Low education	62.1	60.5	55.9	63.2	48.6	40.1
Social functioning						
Whole population	77.6	80.1	74.8	76.3	73.8	68.1
High education	80.3	84.2	84.4	80.6	80.5	76.0
Middle education	77.7	81.9	78.5	75.7	74.7	79.6
Low education	76.3	78.0	73.1	75.9	72.3	66.0

Table 2 (Contd.)
Mean Scores of SF-36 Dimensions

Age	Men			Women		
	18-24	25-44	45+	18-24	25-44	45+
Role emotional						
Whole population	76.1	78.8	75.0	75.0	73.1	65.9
High education	76.3	79.6	88.5	80.1	83.6	84.3
Middle education	76.4	82.3	80.8	74.4	73.9	83.2
Low education	74.8	76.0	72.5	73.8	71.2	62.2
Mental health						
Whole population	70.1	71.6	68.5	65.6	61.4	56.2
High education	71.2	76.7	77.5	67.8	76.5	73.0
Middle education	70.6	73.4	74.3	64.5	62.0	67.5
Low education	67.9	69.3	66.3	70.6	58.9	53.4

female (FEM) and having low (LOWED) or middle (MIDED) education. Being blue collar was also used as a dummy variable (BLUE) to explore other possible explanations of the dependent variable, i.e., of the eight MOS SF-36 dimensions.

Results

Table 1 shows the number of individuals interviewed distributed by gender, age and educational level. As observed in this table, a large majority (94.5%) of low educated people is older than 25 years, with 42.2% of them older than 45 years. At the other extreme, higher educated people are, as expected, older than 25 and younger than 45 years. Older people are in its majority (79.3%) low educated.

Table 2 shows the mean scores of the SF-36 dimensions, split by gender, for the whole population, for each education level and for each age group.

It is evident that perceived health status declined at the same time that educational level decreases: the lower the education, the lower is the perceived health status. However, looking at the magnitude of the effect sizes, we observe some reversals, i.e. higher education cells with standardized differences have lower mean scores than other corresponding to lower education. Using the criteria proposed by Kazis, these few observed reversals are not significant. Performing statistical tests to compare the corresponding mean values do support this last conclusion.

Fig. 1 plots the values of the effect sizes obtained from Table 2, for men and women and for each age group. Here, even not being significant, the reversals are easily observed.

Especially in what concerns the difference between the two extreme levels of education (high and low), we may observe that low

Table 3

Influence of Gender and Education in the Perceived Health Status

Age	Dependent Varibles (DEPVAR)	Independent Variables					
		FEM		LOWED		MIDED	
		BETA	SIG.	BETA	SIG.	BETA	SIG.
18-24	Physical function			-11.170	0.008		
	Role Physical			-8.270	0.023		
	Physical pain	-7.150	0.000	-8.150	0.032	-7.544	0.018
	Vitality	-7.985	0.000				
25-44	Physical function	-6.907	0.000	-19.850	0.000	-5.203	0.000
	Role Physical	-4.697	0.001	-17.569	0.000	-9.185	0.000
	Physical pain	-11.927	0.000	-14.856	0.000	-9.377	0.000
	General Health	-6.509	0.000	-13.490	0.000	-6.230	0.000
	Vitality	-10.881	0.000	-15.874	0.000	-8.588	0.000
	Social function	-7.046	0.000	-7.714	0.000	-4.701	0.041
	Role emotional	-5.278	0.000	-8.797	0.000		
	Mental Health	-10.021	0.000	-13.796	0.000	-10.231	0.000
45+	Physical function	-10.753	0.000	-23.976	0.000		
	Role Physical	-9.290	0.000	-22.065	0.000		
	Physical pain	-12.095	0.000	-19.632	0.000		
	General Health	-8.180	0.000	-18.230	0.000	-9.144	0.005
	Vitality	-13.759	0.000	-18.157	0.000		
	Social function	-6.135	0.001	-10.645	0.002		
	Role emotional	-8.241	0.000	-19.197	0.000		
	Mental Health	-11.512	0.000	-15.481	0.000		

education has higher negative impact on women's health status than in men's. On the other hand, the largest differences are produced in individual older than 45 years, mainly in the general health (GH) dimension. In youngest individuals (18-24), physical dimensions are the dimensions that differentiate the most : bodily pain (BP) among men, and physical functioning (PF) and physical problems (RP) among women. Education affects older people in general health (GH) for both male and female. Finally, we looked at the various SF-36 dimensions as dependent variables (DEPVR) and attempted to explain each of them by regressions like DEPVAR = beta 1 + beta 2 * FEM + beta 3 * LOWED + beta 4 * MIDED. Table 3 presents the significant results of these series of regressions.

The regression scores show that, for people aged between 18 and 24 years old, low

education implies less 11.2%, 8.3% and 8.1%, respectively in the physical function, role physical and physical pain. Low education is also significantly related to all physical and mental SF-36 dimensions for people older than 25 years old. Similarly, being young female negatively affects the physical pain and the vitality scores. However, older female always have lower scores than men, for all SF-36 dimensions. These results may be biased towards higher values due to the lack of inclusion of variables which may potentially explain the dependent variable. Using another variable (e.g. blue collar) we looked into this last concern; the major conclusions did not change, though. Having a secondary education level is a significant determinant for physical pain in younger adults. However, for elderly, only the dimension 'general health' is affected by this level of education. On the other hand, for middle age adults, every SF-36 dimensions but 'role emotional' is affected.

Discussion

Two major conclusions may be drawn from this study. The first one is that people in lower educational level also show, in general, lower than health status scores. In fact, the scores from the Health Survey in individuals with low education (at most, basic school) are lower than the scores corresponding to the health perceived by people with higher education (polytechnic school or university). The same relations are evident in people with low and middle education. As well as in the study performed by Regidor and colleagues (19) for the Spanish population, these results go along with the public health literature (3, 4, 5). However, contrary to the Spanish study we did not find any significant reversal. This same conclusion is observed when ordinary least squares regression is used.

On the other hand, the health dimensions with the highest education standardized difference vary with age. In fact, within people aged 18 to 24 years old, the largest difference is observed in physical health in women with lower education. These young less educated women have sooner reached the "working" world and feel the physical impact of not being still studying. Between the 24 and 44 years of age, the largest differences are observed in physical health and general health in both genders, but especially in women. Mental health also has large differences. Finally, this paper helps us to increase our knowledge about how educational level relates to health status, its determinants and older factors that influence people's health perception.

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