

Obesity, job satisfaction and disability at older ages in Europe

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Abstract:

This study explores the effect of obesity on the levels of job satisfaction reported by older workers (aged 50-64) without and with disabilities in ten European countries. Using longitudinal data from the Survey of Health, Ageing and Retirement in Europe (SHARE) for the years 2004, 2007 and 2011, we estimate a job satisfaction equation (with panel data techniques and running instrumental variable analysis) which includes a set of explanatory variables measuring worker's obesity and disability status (non-disabled, non-limited disabled, and limited disabled). Our results show that obesity has a negative and significant impact on the job satisfaction scores reported by all older workers. However, this negative effect of obesity on job satisfaction is found lower for workers with disabilities (especially for those who are limited in their daily activities) as compared to workers without disabilities. In addition, we find important differences in terms of job satisfaction by disability status between non-obese and obese workers in most of the European countries analysed. Public policy recommendations are given.

Keywords: obesity, job satisfaction, disability, the elderly, Europe.

JEL codes: J28; I18

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Introduction

The level and trends of overweight and obesity rates worldwide have become a major public health concern. According to the World Health Organization, in 2008, 35% of adults were overweight (i.e. Body Mass Index (BMI) ≥ 25 kg/m²). The worldwide prevalence of obesity has nearly doubled since 1980 (World Health Organization, 2010). In developed countries more than half of the adult population is overweight or obese (OECD, 2013). Even in countries where overweight rates are much lower (Japan, Korea, France or Switzerland) compared with others (the English-speaking countries), they have been increasing during the past decades. Overweight and obesity lead to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance (World Health Organization, 2010). As a consequence, the risk of a number of non-communicable diseases increases with BMI. The most important are cardiovascular diseases (mainly heart disease and stroke), type 2 diabetes, musculoskeletal disorders (especially osteoarthritis) and various types of cancer (endometrial, breast, and colon) (World Health Organization, 2000). At a basic level, obesity is the result of consuming more calories than one expends over an extended period of time. In her survey of the factors behind this rising phenomenon, Rosin (2008) explores the range of possible causes, from biological characteristics to behavioural aspects, to changes in transport, working conditions and food industry which together promote an obesogenic environment (Swinburn, Egger, and Raza, 1999).

Alongside its adverse effects on health, numerous studies have found that obesity is negatively correlated with both the psychosocial well-being and the socioeconomic prospects of individuals, also affecting negatively the economic productivity of the workforce (Sassi, 2010). Particularly in older adults, the presence of obesity is related to increased disability (Samper-Ternent and Al Snih, 2012) and, consequently, to increased probability of early retirement (Renna and Thakur, 2010). However, the interaction of these variables deserves further investigation in

order to expand the evidence on the causal relation between obesity, disability and labour market outcomes. Cawley (2000) concludes that there is no evidence of body weight causing disability, so the observed correlation might be explained by the other two alternatives, that is, disability causing an individual to be overweight or unobserved factors causing both. Nonetheless, Burkhauser and Cawley (2004) find some evidence that body weight increases the odds of having health-related work limitations. In order to obtain better information on the impact of obesity and disability and their interaction on labour outcomes, we focus on a variable that has been surprisingly neglected within this literature on obesity: job satisfaction.

The aim of this paper is to investigate the influence of obesity in job satisfaction among older people in Europe with different levels of disability. For this purpose, we will test the three following hypotheses: a) Overweight people have lower job satisfaction than people with normal weight independently of their degree of disability; b) Overweight people without disabilities experience more job satisfaction than overweight people with disabilities, and c) The degree of limitation in the daily activities of people with disabilities significantly affects the levels of job satisfaction of overweight people. Our first contribution is to investigate the causal relationship between body weight and job satisfaction. To our knowledge this interaction has not been previously analysed. We have an important body of literature on job satisfaction for older people in general (for example, Groot 1999; Eichar et al. 1991; Blanchflower and Oswald, 2008; Jung et al. 2007), but only a few studies have focused on the existing relationship between disability and job satisfaction (e.g., Burke, 1999; Renaud, 2002; Uppal, 2005; Pagán and Malo, 2009; and Pagán, 2011 and 2012). The relationship between BMI and general life satisfaction has been studied and found to be negative in the works of Oswald and Powdthavee (2007), Stutzer (2007), Katsaiti (2012), and Böckerman et al. (2014), although only in the first and last studies are some measure of disability considered as a control. Muenster et al. (2011) analyse the relationship between being overweight/obesity and perceived job insecurity, which might be considered a major source of stress and lack of job satisfaction. Our second contribution is introducing the degree of disability as a control in our estimation. Previously, Oswald and Powdthavee (2007) and Böckerman et al. (2014), introduced a measure of disability or functional capacity,

respectively, as a control for life satisfaction. Our third contribution is to aid in the design of policies aimed at prevention and correction of the consequences of this problem.

The structure of the paper is the following. Section two reviews the literature on the relationship between obesity, disability and satisfaction. In the third section the database, the variables, and the economic model are described. The fourth section discusses the main results, and the last section includes the main conclusions, provides public policy recommendations, and suggests future venues for research.

Review of literature

Economic literature provides a large body of evidence for a negative association between obesity and labour market outcomes. We have studies on obesity and employment, with obese individuals (especially women) less likely to be employed or to regain employment (Cawley and Danziger, 2005; Morris, 2007; Greve, 2008; Caliendo and Lee, 2013). There is also a large body of research examining the relationship between obesity and wages; in most cases evidence of a negative association is found, with a heavier wage penalty for women, both in the United States (Averett and Korenman, 1996; Cawley, 2004; Gregory and Ruhm, 2011) and in Europe (Lundborg et al., 2007; Garcia and Quintana-Domeque, 2007). Brunello and D'Hombres (2007) also find that the negative impact of the BMI on earnings is stronger in Southern Europe. The great majority of this literature has used BMI, both measured and self-reported, together with a number of socioeconomic controls. Nonetheless, the results from some studies that use fat-free mass and body fat to measure obesity (Wada and Tekin, 2010; Bozoyan and Wolbring, 2011) confirmed the results of previous investigations that used BMI.

Perhaps the most important methodological concern of this type of research has been to disentangle correlation from causation (Averett, 2011). That is, to determine whether the observed relationship between obesity and poor labour market outcomes is basically due to: a) low wages causing obesity; b) obesity causing low wages, or c) a third unobserved factor causing both. Among the econometric methods used to circumvent this potential endogeneity we count the introduction of lagged indicators of BMI (Averett and Korenman, 1996; Cawley, 2004) in order to remove the effects of contemporaneous BMI on wages. Nonetheless, the rest of potential

factors which affect BMI and wages (time-preferences, e. g.) continue untreated. So, a complementary strategy is the estimation of a sibling or individual fixed-effect estimator to account for family or individual unobserved heterogeneity (Averett and Korenman, 1996; Cawley, 2004). Nonetheless, this presupposes that all unobserved heterogeneity is constant over time.

One important step ahead has been the introduction of the method of instrumental variables since Cawley (2000). The instruments used in the literature have been mainly the BMI of the respondent's sibling (Cawley, 2004; Shimokawa, 2008; Gregory and Ruhm, 2011), based on the notion that it must be strongly correlated with that of the respondent herself but not with her wage (except through BMI). Others studies use parent BMI (Kline and Tobias, 2008; Lindeboom et al., 2010), area obesity level (Morris, 2007) or birth order, sibling sex and spousal obesity (Lundborg et al., 2007). The vast majority of studies suppose a linear relationship between wages and BMI. Nonetheless a number of recent studies are challenging this notion (Shimokawa, 2008, Gregory and Ruhm, 2011 or Caliendo and Gehrsitz, 2014). Atella et al. (2008) adopt a quantile regression and conclude that a significant amount of heterogeneity is masked when regular regression analyses are used. Burkhauser and Cawley (2004) add another important conclusion for our investigation: if obesity is not treated as endogenous (they use the method of instrumental variables), the link between obesity and disability tends to be dramatically underestimated.

There are some empirical studies exploring the effect of obesity on life satisfaction or subjective well-being (Oswald and Powdthavee, 2007; Stutzer, 2007; Katsaiti, 2012; Böckerman et al., 2014). These studies tend to find that obesity has a negative effect on life satisfaction after introducing a number of socioeconomic covariates in their regressions. However, in Böckerman et al. (2014), once controls for health and normal functioning status are introduced, the negative association between obesity and subjective well-being disappears almost completely. Muenster et al. (2011) find a significant relationship between being overweight/obesity and perceived job insecurity. However, any potential endogeneity is not corrected. In her review on the relationship between obesity and depression, Granberg (2011) concludes that although the association is clear,

evidence shows that it operates in both directions, with each condition contributing to the development of the other, a view shared by Luppino et al. (2010).

Data and methods

Sample

This study employed the three available waves (2004/05, 2006/2007 and 2010/11) from the “*Survey of Health, Ageing, and Retirement in Europe (SHARE)*”. This survey contains valuable information on the lifestyle of individuals older than 50, such as questions relating to health (consumer habits, physical exercise, etc.), physiological aspects (mental health, well-being and satisfaction), socio-economic status (job activity and characteristics, wealth, consumption habits, education, housing) and social support (social networks and volunteer work), among others. Although this information is available for 19 European countries and Israel, in our case, we leave out of our analysis those countries for which we do not have relevant information for the three waves. Specifically, our sample is formed by 10 countries representing different regions: Northern Europe (Denmark and Sweden), Western Europe (Austria, Belgium, France, Germany, Holland and Switzerland), and Southern Europe (Italy and Spain). As we are interested in determining the degree of job satisfaction, we include some restrictions when selecting our final sample. Specifically, we only select for our sample those individuals between 50 and 64 who are working and who are “*salaried*”. After eliminating any observations with nonexistent or incomplete information for the key variables used in this study, the final sample is made up of 13,277 observations (which correspond to a total of 10,147 individuals).¹

Measures

The SHARE survey includes a large number of questions referring to characteristics of the individual’s job, among which is the level of job satisfaction. Furthermore, the SHARE survey provides information about certain body characteristics in those individual surveyed, such as,

¹ Due to size limitations in our final sample, it has not been possible to estimate job satisfaction equations for each of the European countries included in our sample

among others, weight and height. Based on these two variables, the “*Body Mass Index (BMI)*” is constructed.

In line with other previous studies on disability (e.g. Gannon, 2005; Jones et al., 2006; Gannon and Munley, 2009; Pagan, 2011), we split the disabled sample into two different groups: (a) Limited disabled individuals, i.e. those reporting a chronic illness or disability and saying that it severely limits them in their daily activities or those who report a chronic illness or disability and saying it limits them but not severely (to some extent); and (b) Non-limited disabled individuals, i.e. those who report such a condition but state that it is not one which limits them in their daily activities (either because of the low severity of their disabilities or because they have compensated their disabilities with different technological devices or both).

Method

To estimate the factors affecting job satisfaction in the workers, we use the theoretical framework proposed by Clark and Oswald (1996) which is based on defining the utility reported by the persons employed in the following way:

$$U_j = u_j(y, h, i, w) \quad j = N, NLD, LD \quad [1]$$

where y represents the worker’s income, h the working hours, i is a vector of the worker’s personal variables (age, gender, civil status, nationality, education level, body mass index, degree of disability, country of residence and year of interview) and w is another vector of variables related to the type of work that a person has (salary, weekly working hours, experience, type of contract, having a second job, having the right to a pension, occupation, industry). In order to estimate this utility function, previous literature has employed the variable job satisfaction (as a proxy variable) and used different econometric techniques. In our case, and to correct for any potential problems of endogeneity in the variable measuring an individual’s body mass, we have employed a random effects model with instrumental variables to estimate our job satisfaction equation in two stages and in line with previous studies on obesity for the general population, such as, Cawley (2001) and Burkhauser, and Cawley (2004). In function of the variables available in the three waves used in the SHARE, the instruments utilized to estimate the body mass index in the first stage were the following: a) Whether the person habitually drinks in the last three

months (Question: “During the last 3 months, how often have you drunk any alcoholic beverages, like beer, cider, wine, spirits or cocktails?”) and b) the weekly frequency that a person takes medication (Question: “Do you currently take medication at least once a week for problems mentioned on this card?”). For these instruments to be valid, they must have an effect on the BMI and not be correlated with our key variable “job satisfaction”. Previous literature has found a significant correlation between these two variables and BMI. For example, Colditz et al. (1991) and Lukasiewicz et al. (2005) find a negative relation between the consumption of alcohol and obesity. There are also studies which have analyzed the relation between obesity and the use of medication, although the results are mixed (see, for example, Bray, 1993; Padwal and Majumdar, 2007). In our case, the estimates obtained in the first stage confirm the negative effect of alcohol consumption and use of medication on the levels of an individual’s body mass, while neither of these two variables has any effect on the levels of job satisfaction observed for all of the worker subsamples. Once this first stage is estimated, we include in the job satisfaction equation the BMI prediction obtained and proceed to its estimation to determine the real effect of this variable on the dependent variable “job satisfaction”.

Results

Descriptive analysis

Figure 1 shows the average job satisfaction of salaried workers according to their BMI and degree of disability. Taking into account the World Health Organization classification, we group the individuals into four categories according to their BMI: Underweight (>10 - <18.5), Normal (18.5 - <25), Overweight (25 - <30) and Obese (≥ 30). To correctly interpret the results we have to take into account the fact that the sample is composed mainly (82%) of individuals of normal weight or who are overweight. Obese individuals make up 17% of the sample, while barely 1% of those surveyed report being underweight. As for disability, 36% of the sample report suffering from one to some extent: 21% with a higher degree of severity and 15% without it restricting their daily activities. The most significant result of this comparison is that the average levels of job satisfaction and the non-disabled persons and the non-limited disabled are very similar for the main categories (*normal and overweight*), while the limited disabled report significantly lower

levels of satisfaction. Notwithstanding, for the category of most interest to our study (obese), the differences between the three collectives according to level of disability are statistically significant. Persons with limited disability report lower levels of satisfaction than non-limited disabled people, which at the same time, are below the levels of persons without disabilities. As for the category *underweight*, the persons without disabilities continue to show higher levels of satisfaction than the rest. In this case, the statistical interpretation is much more problematic, given that we only have 226 individuals who report being underweight.

[Figure 1]

It is of interest to analyse the average satisfaction taking into account whether the individual is obese or not in the countries in our sample. To calculate the differences in average job satisfaction by country we construct a dummy that takes the value of one when the BMI is greater than or equal to 30 and zero otherwise. This study reveals that in France, the maximum satisfaction is reached (0.334) among workers with limited disability, with this difference being significant at 1%. For this same collective, another central European country, Switzerland (-0.188) shows at a 10% level. There are clearly greater satisfaction differentials in Nordic countries (Sweden, Holland and Denmark). For example, for non-disabled persons the maximum differentials are in Sweden (0.139) and Holland (0.108) with a level of significance of 1% and 10% respectively. In the case of individuals with non-limiting disability, the highest differential with a significance of 10% is found for Denmark (-0.209). Also, for the limited disabled, Switzerland (-0.189) and Denmark (0.171) are among the countries with the highest significant differences.

[Figure 2]

Table 1 shows the personal and job characteristics of the salaried workers with and without disability (limited or not), depending on whether they are obese or not. There are no significant differences by age. According to *sex*, obese males predominate in both levels of disability. Non-obese women with some type of disability (limited or not) represent a higher percentage, with the differences being significant in both cases. *Married* in all cases is higher than 70%, although the only significant differences are those between obese and non-obese individuals with some form

of disability. Practically all of the individuals in the sample are from the country in which they work, with the significant difference only in the case of the non-limited disabled. With regard to *education level*, the incidence of obesity is higher in those workers who only have attained the first three educational stages, primary, secondary, and post-secondary, with these significant differentials for non-disabled and non-limited disabled in the two lower education levels (primary and secondary); in the third level (post-secondary) the significant differences are only in the case of the disabled for limited as well as non-limited individuals. A noteworthy result is that this trend changes in the highest education level, where a percentage of non-obese workers is significantly higher in the three categories. This result is in line with other studies that show that individuals with a higher education level show a lower risk of suffering from obesity (e.g., Devaux et al., 2011).

[Table 1]

Regarding job characteristics, the *number of hours worked* turns out to be similar in both cases (obese and non-obese), with the main significant differences being concentrated in the limited disabled. In terms of salary, the workers without disability and the non-obese workers with disability obtain higher salaries, with significant differences in all of the cases, and the highest being in the limited disabled (-0.134 points). This conclusion coincides with other studies such as that of Brunello and D'Hombres (2007) or Cawley (2004). Differences in tenure are significant for non-obese workers, with these differences being significant for the non-disabled and the limited disabled. Although more than 86% of all the workers report having a permanent or indefinite contract, the differences between obese and non-obese are only significant for the non-disabled and the limited disabled. With respect to the characteristic *having a second job*, there are significant differences between obese and non-obese, in favor of the former, except for the non-disabled. Over 80% of all workers have the right to receive a *future pension*, with significant differences observed in the case of the non-disabled and limited disabled, in favor of the non-obese.

The relation between obesity and the category *occupation* turns out to be coherent with that previously observed in relation to education. Thus, non-obese workers (with and without

disabilities) who have a higher level of education, hold higher occupational categories (management and professional) in a significantly greater degree than the obese. The results for the two characteristics related to health are similar. Thus, the percentages of the non-obese workers who *take medication and drink alcohol on a daily basis* (between five and seven days a week) are on average higher than the obese, showing a significant differential in almost all of the cases. This would be in line with the econometric results of the model. Lastly, at the *industry* level, numerous significant differences are also detected between the obese and non-obese workers. Employees without problems of obesity, with significant differences, are concentrated in the sector: education (in the three subsamples), sales (in the case of non-disabled), public administration, banking and finance (for the case of the non-limited disabled) and construction, hotels-restaurants (limited disabled). On the contrary, obese workers are mainly represented in sectors such as transport, communications and other activities (in the three subsamples), manufacturing, electricity and construction (in the case of the non-limited disabled). In the survey's first year (2004) in all of the subsamples, the percentage of non-obese is higher than that of the obese, with these differences being significant. For the second year analyzed (2007), this trend holds only in the case of the limited disabled, while in the case of the non-disabled and non-limited disabled there is a greater incidence of obese workers, with the all the differences being equally significant. Finally, in the last year considered (2010), there are only significant differences in the case of the non-disabled and the limited disabled; in the first case the non-obese represent a higher percentage, while in the second group the percentage of obese surpasses that of the non-obese.

Econometric analysis

Table 2 shows the results obtained from the estimation of estimating our job satisfaction equation using a G2SLS Random-effects Instrumental Variable Regression for all workers. Before analyzing the results, it must be said that although the results of the first stage are not shown in this table (as previously indicated), the coefficients of the variables used as instruments to correct for any potential endogeneity of the BMI variable (that is, consumption of alcoholic drinks and use of medication) are significant and negative (these results are available from the authors). In

the first place, and according to Table 2, we can observe that the coefficient BMI is negative and statistically significant at 10%, indicating that a higher value of said variable lowers the levels of satisfaction reported by workers. This result is in line with those previously obtained in the existing literature. In the second place, the coefficients of the explanatory variables related to the degree of disability of the individual are negative and statistically significant with respect to the reference category “*non-disabled*”. Furthermore, the penalization in terms of job satisfaction for having a disability is greater for those individuals who are limited in their daily activities in comparison to those who were not (-1.060 *versus* -0.895). Just as before, this result is consistent with previous literature on the relation between disability and job satisfaction (i.e., Pagan and Malo, 2009; Pagan et al., 2014). Third, a series of interaction terms between the variable disability and BMI to identify the existence of a differential effect of the BMI variable according to the degree of disability that an individual has (i.e., non-disabled, non-limited disabled and limited in daily activities disabled). According to Table 2, it can be observed that the coefficients estimated for the two terms of interaction are statistically significant and positive at conventional levels of significance. That is, being disabled slightly lowers (by 0.035 and 0.036 points for the non-limited and limited, respectively) the negative and individual effects of the BMI and disability variables on the variable “*job satisfaction*”. For example, for persons with disabilities that are limited in their daily activities, the total effect on levels of job satisfaction would be -1.355 (= -0.331-1.060+0.036), while for non-limited disabled it is -1.191 (= -0.331-0.895+0.035).

With respect to the rest of the explanatory variables, no significant differences can be discerned for reasons of “*sex*” or “*nationality*”, although they can be for the variables “*married*” and “*age*”, with the youngest workers in our sample (between 50 and 54) having the highest level of job satisfaction. The variables linked to the worker’s “*education level*” “*hours of work*”, “*second job*” and “*right to a pension*” do not show significant coefficients. As for job characteristics, the coefficients “*salary*”, “*tenure*” and “*permanent job*” are significant. Furthermore, all of the jobs show significantly lower levels of job satisfaction than the reference category (legislators and managing directors). The coefficients of the variable related to the productive sector are chiefly non-significant. With regard to the variable “*country*”, all the

coefficients are significant (except Austria and Switzerland), with job satisfaction in all cases lower than Denmark, which is the reference country in the regression. The control variable for the year of the survey is not significant.

Discussion

This study has analysed the incidence of obesity in job satisfaction among older people with different levels of disability. Three hypotheses have been tested: a) Overweight people have less job satisfaction than normal weight people independently of their degree of disability; b) Overweight people without disabilities have more job satisfaction than overweight people with disabilities, and c) The degree of limitation in daily activities of people with disabilities significantly affects the levels of job satisfaction of overweight people. Using the data from the three waves of SHARE, we have estimated a G2SLS Random-effects Instrumental Variable Regression; our results indicate that obesity has a negative and significant impact on the reported job satisfaction of all workers, which confirms the first hypothesis. This result is in line with the literature on the relation between obesity and other labour market outcomes (Averett, 2011). Similar negative effects have also been found in the studies on the relationship of obesity and life satisfaction (Oswald and Powdthavee, 2007; Stutzer, 2007; Katsaiti, 2012; Böckerman et al., 2014). The second and third hypotheses are also confirmed: workers' disability status and degree of disability have a negative and significant impact on job satisfaction, a result which is in line with previous literature (for example, Pagán et al., 2014). These results suggest that the impact of obesity on job satisfaction cannot be fully captured until a measure of disability is included in the model. This is consistent with the study of Böckerman et al. (2014), who find that the negative association between obesity and subjective well-being tend to disappear when controls for health and functional capacity are introduced. Another interesting result is that the negative effect of obesity on job satisfaction is found to be lower for disabled workers, both limited and not limited in their daily activities. That is, the negative impact of obesity and disability does not aggregate completely, perhaps owing to the fact that both conditions have the same kind of negative impact (limitations in normal functioning, for example) on job satisfaction. In addition, we find important

differences in job satisfaction by disability status between non-obese and obese workers in most of the European countries in the sample.

From the point of view of public policy, the results are relevant for achieving improved understanding of the workplace performance of people with disabilities and/or obesity, which might help design better measures to maintain and promote the employment for this collective. Obesity is a factor that contributes negatively to job satisfaction. Nonetheless, worksite settings are considered to provide unique opportunities for the effective promotion of healthier lifestyles, both from the point of view of nutrition and of physical activity (Katz et al., 2005). In addition, employers have every reason (increased productivity, less safety incidents) to keep their workers healthy and fit (Goetzel et al., 2011). Our results show that obesity is a burden that, in terms of job satisfaction, varies across different types of workers. This implies that public policy efforts should be targeted to each collective. On the side of prevention and correction, recommendations and incentives that might make a difference should take into account the particular environmental and psychosocial difficulties of people with disabilities.

The European Disability Strategy 2010-2020 proclaimed among its objectives, to “enable many more people with disabilities to earn their living on the open labour market”. Its key actions included to “increase knowledge on employment situation of people with disabilities” and “address the issue of quality of jobs, such as salaries, working hours and career advancement of people with disabilities”. In regard to the foregoing, our results suggest that obesity and disability do not just have a negative impact on job satisfaction. Indeed, they might also have the same kind of negative impact (due to limitations in normal functioning, for example), so the same kind of interventions in the workplace (to help overcome these limitations) might be required in order to improve the levels of satisfaction and productivity of both disabled and overweight individuals.

Future research and limitations

Our sample includes only older workers (aged 50-64) in a Western European context. In order to provide additional insight into the relationship of disability and obesity, future research should explore whether our results hold with samples including both workers from a broader range of ages, and workers from other countries with different labour markets. It would be interesting to

check, for example, if obesity and disability also weaken the negative effects of each other in younger populations. The answer to this question would help in understanding the mechanisms that govern their association throughout the life cycle. The finding that the satisfaction penalty from obesity is lower for the disabled opens another avenue of future research. Specifically, can we expect to find the same pattern with other labour market outcomes (for example, wages). Future research could also address the role of workplace discrimination against the obese, which might have an important influence on job satisfaction. Finally, a limitation of our study is that, due to the lack of other measures of body fat, we have used simply self-reported BMI, which, although it is widely used in the literature, might be a flawed indicator (Burkhauser and Cawley, 2008).

Due to size limitations in our final sample, it has not been possible to estimate job satisfaction equations for each of the European countries included in our sample

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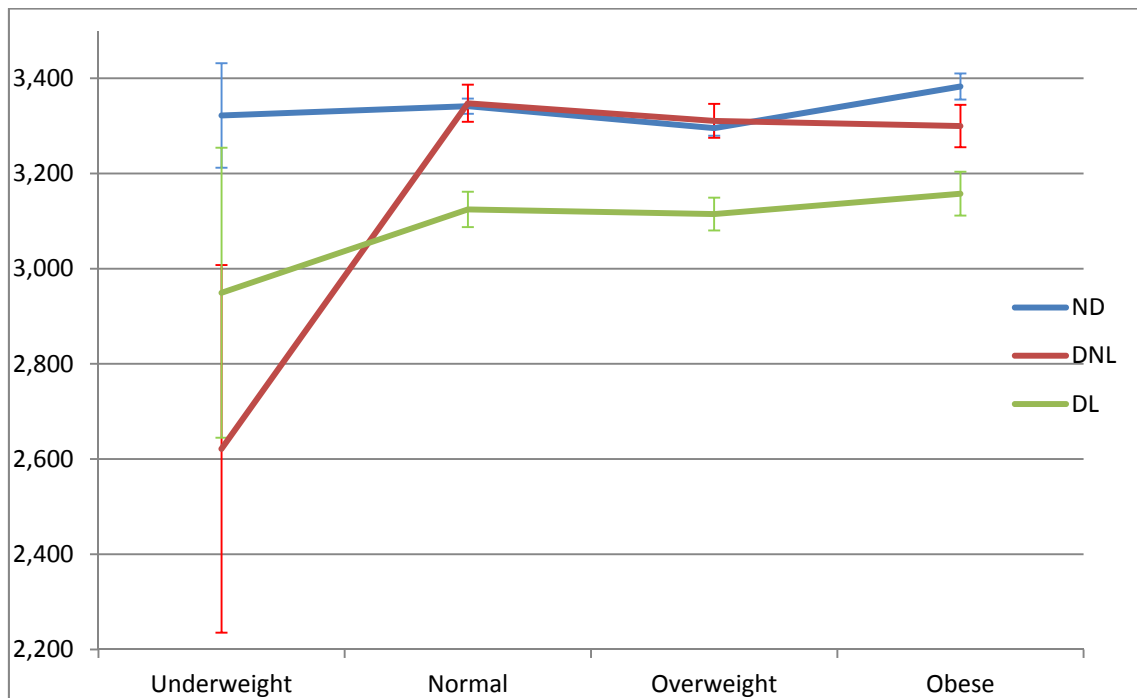
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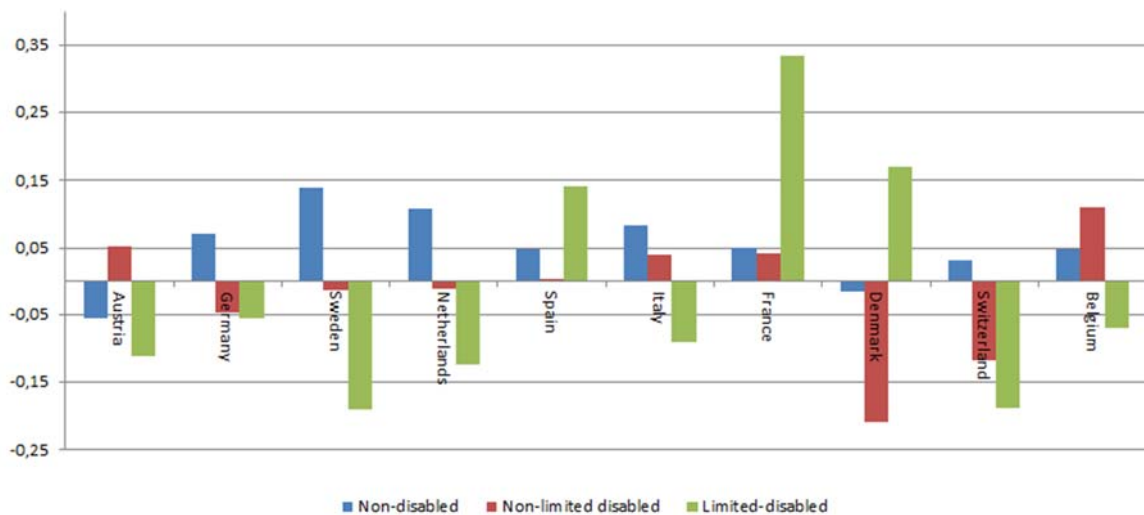
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Figure 1. Mean job satisfaction by Body Mass Index (BMI) and disability status.



Note: Individuals aged 50-64. Weighted data. Confidence intervals (95%) are reported for each mean job satisfaction.
Source: SHARE 2004, 2007 and 2011.

Figure 2. Differentials in job satisfaction scores between obese and non-obese employees by country and disability status.



Note: Individuals aged 50-64. Weighted data.
Source: SHARE 2004, 2007 and 2011.

Table 1. Personal and job characteristics of non-disabled, non-limited disabled and disabled employees by obesity status (O= Obese, NO= Non-obese).

	NON-DISABLED			DISABLED					
	O	NO	Diff.	Non Limited			Limited		
				O	NO	Diff.	O	NO	Diff.
Age	54.818	54.891	-0.074	55.398	55.418	-0.020	55.713	55.602	0.111
Female	0.444	0.459	-0.015	0.427	0.486	-0.059*	0.431	0.489	-0.058*
Married	0.762	0.763	0.000	0.686	0.752	-0.066*	0.805	0.749	0.056*
Nationality	0.970	0.973	-0.003	0.991	0.972	0.019*	0.975	0.980	-0.005
Educational level									
Primary	0.173	0.102	0.071*	0.155	0.112	0.043*	0.094	0.085	0.009
Secondary	0.572	0.545	0.027*	0.618	0.512	0.106*	0.638	0.611	0.027
Post-secondary	0.041	0.037	0.005	0.036	0.259	0.010*	0.068	0.046	0.022*
Superior	0.213	0.316	-0.103*	0.192	0.350	-0.159*	0.199	0.258	-0.058*
Hours of work									
<30	0.197	0.180	0.017	0.241	0.202	0.039*	0.231	0.283	-0.052*
30-35	0.135	0.154	-0.019*	0.144	0.154	-0.010	0.132	0.133	-0.001
36-39	0.152	0.148	0.004	0.174	0.167	0.007	0.187	0.148	0.039*
= 40	0.232	0.247	-0.014	0.172	0.213	-0.040*	0.233	0.191	0.042*
>40	0.283	0.271	0.013	0.269	0.265	0.004	0.216	0.245	-0.029*
Ln (net hourly wage)	2.031	2.152	-0.121*	2.022	2.129	-0.108*	1.835	1.969	-0.134*
Tenure	18.831	20.659	-1.829*	19.327	19.596	-0.269	18.447	19.289	-0.842*
Permanent job	0.872	0.908	-0.036*	0.899	0.891	0.009	0.862	0.894	-0.032*
Second job	0.061	0.061	0.000	0.092	0.062	0.030*	0.091	0.067	0.024*
Pension	0.784	0.819	-0.035*	0.848	0.846	0.002	0.840	0.874	-0.034*
Occupation									
Managers	0.072	0.105	-0.033*	0.059	0.086	-0.027*	0.052	0.079	-0.027*
Professionals	0.091	0.162	-0.070*	0.084	0.167	-0.083*	0.069	0.110	-0.040*
Technicians	0.164	0.167	-0.003	0.178	0.178	0.000	0.129	0.156	-0.027*
Clerks	0.158	0.151	0.007	0.141	0.194	-0.053*	0.116	0.130	-0.014
Service and sales	0.156	0.137	0.019*	0.182	0.155	0.028	0.222	0.169	0.053*
Skilled agricultural/fishery	0.021	0.015	0.006	0.011	0.018	-0.007	0.016	0.016	0.000
Craft	0.096	0.097	0.000	0.127	0.070	0.057*	0.124	0.134	-0.010
Operators	0.083	0.069	0.014*	0.087	0.042	0.044*	0.109	0.088	0.021*
Elementary	0.159	0.098	0.061*	0.131	0.090	0.041*	0.163	0.120	0.044*
Health									
Drinker	0.235	0.280	-0.045*	0.192	0.278	-0.086*	0.190	0.193	-0.003
Drugs	0.481	0.625	-0.144*	0.139	0.242	-0.103*	0.112	0.204	-0.092*
Industry									
Agriculture/fishing	0.028	0.020	0.007*	0.018	0.002	-0.002	0.022	0.015	0.006
Manufacturing	0.021	0.024	-0.002	0.067	0.021	0.046*	0.035	0.032	0.002
Electricity	0.161	0.173	-0.012	0.171	0.121	0.050*	0.173	0.195	-0.022
Construction	0.070	0.070	0.000	0.076	0.042	0.034*	0.048	0.075	-0.027*
Sales	0.059	0.087	-0.028*	0.073	0.063	0.010	0.063	0.077	-0.013
Hotels and restaurants	0.021	0.025	-0.004	0.028	0.032	-0.004	0.012	0.029	-0.017*

Transport/communications	0.073	0.054	0.019*	0.080	0.058	0.022*	0.071	0.038	0.033*
Banking and finance	0.114	0.089	0.024*	0.061	0.087	-0.026*	0.063	0.050	0.013
Public administration	0.121	0.105	0.016*	0.093	0.133	-0.039*	0.099	0.114	-0.015
Education	0.068	0.126	-0.058*	0.036	0.153	-0.117*	0.049	0.120	-0.071*
Health and social work	0.129	0.122	0.007	0.128	0.140	-0.012	0.128	0.131	-0.003
Other activities	0.134	0.104	0.030*	0.170	0.131	0.040*	0.237	0.124	0.114*
Year									
2004	0.265	0.290	-0.025*	0.250	0.316	-0.066*	0.204	0.250	-0.046*
2007	0.390	0.327	0.062*	0.341	0.298	0.043*	0.241	0.280	-0.039*
2011	0.345	0.383	-0.037*	0.409	0.386	0.023	0.555	0.470	0.085*

Note: Individuals aged 50-64. Weighted data. (*) Difference between obese and non-obese employees is significant at $P < 0.05$.

Source: SHARE 2004, 2007 and 2011.

Table 2. Job satisfaction regression (G2SLS Random-effects Instrumental Variable Regression).

	<i>Coefficient</i>	<i>z</i>
BMI	-0.331	-1.8 ^a
Non-disabled (<i>reference</i>)	-	-
Limited disabled	-1.060	-2.38 ^b
Non-limited disabled	-0.895	-2.08 ^b
BMI x Non-limited disabled	0.035	2.09 ^b
BMI x Limited disabled	0.036	2.09 ^b
Age		
50-54 (<i>reference</i>)	-	-
55-59	-0.120	-6.59 ^c
60-64	-0.093	-5.47 ^c
Female	-0.001	-0.05
Married	0.038	2.45 ^b
Nationality	0.047	1.35
Educational level		
Primary (<i>reference</i>)	-	-
Secondary	-0.014	-0.56
Post-secondary	-0.012	-0.27
Superior	-0.036	-1.09
Hours of work		
<30	-0.013	-0.64
30-35	0.008	0.41
36-39	-0.008	-0.42
40 (<i>reference</i>)	-	-
>40	0.044	2.47 ^b
Ln (gross hourly wage)	0.022	3.98 ^c
Tenure	-0.006	-3.07 ^c
Tenure ²	0.000	2.73 ^c
Permanent job	0.072	2.90 ^c
Second job	0.022	1.01
Pension	0.027	1.40
Occupation		
Managers (<i>reference</i>)	-	-
Professionals	-0.072	-2.89 ^c
Technicians	-0.124	-5.04 ^c
Clerks	-0.124	-5.03 ^c
Service and sales	-0.124	-4.85 ^c
Skilled agricultural and fishery	-0.135	-1.82 ^a
Craft	-0.127	-4.10 ^c
Operators	-0.175	-4.89 ^c
Elementary	-0.267	-8.84 ^c
Industry		
Agriculture and fishing (<i>reference</i>)	-	-
Manufacturing	-0.010	-0.14

Electricity	-0.057	-0.92
Construction	-0.082	-1.29
Sales	-0.081	-1.27
Hotels and restaurants	-0.182	-2.52 ^b
Transport and communications	-0.052	-0.82
Banking and finance	-0.066	-1.05
Public administration	-0.031	-0.50
Education	-0.027	-0.43
Health and social work	-0.012	-0.20
Other activities	-0.001	-0.02
Country		
Austria	-0.341	-1.18
Germany	-0.123	-4.57 ^c
Sweden	-0.066	-2.67 ^c
The Netherlands	-0.151	-6.19 ^c
Spain	-0.211	-6.10 ^c
Italy	-0.265	-8.55 ^c
France	-0.191	-7.84 ^c
Denmark (<i>reference</i>)	-	-
Switzerland	0.006	0.23
Belgium	-0.044	-1.82 ^a
Year		
2004 (<i>reference</i>)	-	-
2007	-0.020	-1.47
2010	-0.002	-0.14
<i>Constant</i>	4.450	8.87 ^c
σ_u		0.367
σ_e		0.534
ρ		0.321
Number of observations		13,277
Number of individuals		10,147

Note: Individuals aged 50-64. Difference between obese and non-obese employees is significant at $P < 0.05$. ^{a, b, c} imply significance at the 10 %, 5 % and 1 % levels, respectively. The standard errors are robust and allow for clustering at a country level.

Source: SHARE 2004, 2007 and 2011.