



THE RELATIONSHIP BETWEEN EMPLOYMENT AND MENTAL HEALTH PROBLEMS IN ITALY: EVIDENCE FROM EHIS2 MICRODATA

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THE RELATIONSHIP BETWEEN EMPLOYMENT AND MENTAL HEALTH PROBLEMS IN ITALY: EVIDENCE FROM EHIS2 MICRODATA

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Abstract. This paper investigates the role that permanent and full-time job have on the mental health variables of employees using microdata from the 2nd Wave of the European Health Interview Survey controlling for gender, socio-economic status, tighter (marital status, social network) and looser (degree of urbanization of the area in which the individual lives, geographical area) socio-environmental variables, and health status (chronic diseases, chronic anxiety).

Employing a linear regression model with a large dummy-variables set, the main results on the relationship between the employment and mental health problems of the entire sample of individuals between 25–64 years show that in Italy employees with permanent and full-time job have lower probability of having mental health problems compared to the employees without permanent and full-time job; the economic sector where the probability of suffering from MH problems is higher in Energy and Manufacturing, while are the managers to have a lower probability of suffering from MH problems.

Furthermore, the results seem to confirm that in Italy there are gender differences in mental health problems, with males suffering less from overall MH compared to the females, taking into account education, income or the economic sector where they work or the occupation they carry on. Also, the results seem to confirm that there are differences between the Italian regions: a high level of education increases the probability of suffering from mental health problems in the Southern regions while a narrow social network seems to be an important factor in order to increase mental health problems in the Northern regions. To weight status is associated a higher probability of having mental health problems, more in the Southern regions than in the Northern ones.

Albeit with the limitations discussed in the paper, the results we obtained by analyzing the relationship between mental health problems and employment in Italy underline the key dimension of mental health of our all lives.

Keywords: Health; Public health; Economics of gender; Labor contracts; Econometric model;

JEL classifications codes: I10; I18; J16; J41; C50.

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1. Introduction

Mental ill-health has become a key issue for the well-functioning of OECD's labour markets and social policies calling for a stronger focus on policies addressing mental health and work issues (OECD, 2012) for two main reasons: the change in the pattern of employment and the rise in unemployment across OECD countries. Due to the greater competition and technological change driven by globalisation, the employment in the types of jobs typically related to stress (*i.e.* low-skilled occupations) has increased over time: the share of workers employed in manufacturing and other good-producing industries has fallen substantially while the share of workers employed in professional and technical occupations has grown strongly; the percentage of workers in clerical occupations has fallen while the proportion of sales workers has increased.

Moreover, the proportion of workers with a temporary contract has, overall, been rising. As a consequence, the mental health of those at work is also likely to suffer as a result of an increase in economic restructuring and job insecurity. Rising unemployment during the recent recession in all OECD countries has also likely affected the mental health of many people who lost their jobs during this period.

If the change in the pattern of employment and the rise in unemployment summarize the role that employment has on mental health, Layard (2013, 2016) underlines that in advanced countries mental health problems are the main illness of working age, amounting to 40% of all illness under 65 and that mental health is a major factor of production because it affects life satisfaction, earnings, educational success, employment and physical health and that, within healthcare system mental, health promotion and social care would establish parity of treatment for mental illness and physical illness (Layard, 2013, p. 13).

Recently, OECD (2018, ch. 1, p. 39) underlines the socio-economic consequences of this widespread phenomenon.

More than one in six people across EU countries had a mental health problem in 2016, with an estimated 25 million people suffering from anxiety disorders, 21 million from depressive disorders, 11 million people living with drug and alcohol use disorders, almost 5 million people suffering from bipolar disorder, and schizophrenic disorders affecting an estimated 1.5 million people. For each of these individuals, mental illness will affect their daily lives, their relationships, their jobs, their physical health, their economic status and opportunities.

Further on, OECD (2018, ch.1, p. 40) observes that mental ill-health is not distributed evenly across the population, and there are important age, gender and socio-economic differences in the burden of disease:

Some groups are also less likely to be the target of promotion or prevention interventions. Supporting vulnerable groups, such as older people or unemployed people, is important to build more inclusive and active societies, but at present far fewer policies reach these groups. Just as mental ill-health reduces the likelihood of being in employment, unemployment increases the risk of having poor mental health. Actions to prevent mental illness and promote good mental health - reducing loneliness, encouraging social participation, building support structures - can bring lifelong benefits to children and their families, workplace interventions can reduce absenteeism and presenteeism, and suicide prevention strategies can prevent tragic losses of life and potential.

In order to analyze the relationship between employment and mental health, an useful definition of mental health is provided by the World Health Organization (WHO, 2007): "a state of wellbeing in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a

contribution to his or her community”. Mental ill-health encompasses two categories: *Psychological distress* (or symptoms that do not reach the clinical threshold of a diagnosis within psychiatric classification systems) and *Mental disorders* which do reach the clinical threshold of a diagnosis.

It is also interesting to note that the WHO (1946, p.1) defines health as “not merely the absence of disease or infirmity” but “a state of complete physical, mental and social well-being”. In this view, health is not only the absence of illness (e.g., depression, stress, anxiety) (*negative health*) but considers both physical and psychological components of well-being as an important constitutive part of health (*positive health*).

Although WHO (2014) recently highlighted the relevance of positive health, usually only negative health is taken into account in surveys. Moreover, population surveys including clinical interviews are unfrequent and where they exist, usually do not collect detailed information on social and economic variables needed to assess labour market outcomes while population surveys with sufficient labour market detail rarely collect information to measure the prevalence of mental ill-health. Finally, as mentioned by the OECD (2012, p. 20), clinical-epidemiological research suggests that asking people about the existence of a mental illness *directly* does not give reliable outcomes; as an alternative to direct questions, there are various mental health instruments – consisting of a set of questions on e.g. irritability, nervousness, sleeplessness, etc. – many of which have been validated in medical research as providing a very good *proxy* for a more in-depth clinical interview, i.e. as measuring the prevalence of a mental disorder.

The Second Wave of European Health Interview Survey combines main labour market information with a mental health instrument: it collects main labour market information and includes the Patient Health Questionnaire depression scale – PHQ-8 (Kroenke and Spitzer 2002) – which permits identification of individuals who presently suffer from depression. According to Kocjan and Lavtar (2016), this scale has a firm theoretical underpinning and represents a valid measure of depression, which it is also supported in research (e.g. Kroenke et al. 2009)¹.

Our research analyzes the relationship between employment and mental health problems using Italian microdata from the Second Wave of the European Health Interview Survey² (EHIS2): in addition to the usual information (age, sex, education, income, etc.), there are self-reported information on weight, height, mental health variables, health status, self–

¹ As underlined by Kocjan and Lavtar (2016), mental health is not only the absence of mental illness (*negative health*) but also the presence of an individual’s fitness (*positive health*). With PHQ-8 EHIS 2 only addressed the aspect of mental illness, whereas mental health and well-being of respondents were not assessed. In light of the clear theoretical and empirical arguments that mental health cannot be equated with the absence of mental illness, we argue that the third wave of EHIS (EHIS 3) should include measures of mental illness as well as mental health and well-being.

² The European Health Interview Survey (EHIS) was developed between 2003 and 2006. It consists of four modules on health status, health care use, health determinants, and socio-economic background variables. EHIS targets the population aged at least 15 years and living in private households. The four modules cover the following topics: (1) Background variables on demography and socio-economic status such as sex, age, education, labour status, etc.; (2) Health status such as self-perceived health, chronic conditions, limitations in usual activities, disease-specific morbidity, physical and sensory functional limitations, etc.; (3) Health care use such as hospitalisation, consultations, unmet needs, use of medicines, preventive actions, etc.; (4) Health determinants such as height and weight, consumption of fruits and vegetables, smoking, alcohol consumption, etc. The European Health Interview Survey is run every five years. The first wave of The European Health Interview Survey (EHIS1) was conducted between the years 2006 and 2009 without any binding legal basis. The second wave (EHIS2) took place between 2013 and 2015 in all EU Member States, Iceland, and Norway, according to the Commission Regulation 141/2013 as regards statistics based on the European Health Interview Survey (EHIS). See Hintzpeter (2019) for further details on the EHIS2 Survey.

declared labour status, status in employment, full-time/ part-time work, occupation in employment, economic sector in employment.

Among the mental health variables in the EHIS2, there are low interest, depression, sleep troubles, tiredness, eating disorders, sense of failure, low concentration and slow moving/speaking. Sleep troubles and eating disorders are particularly interesting because they are relatively new mental health problems compared to the most common ones such as depression or sense of failure. In our paper, we consider the relationship between employment and mental health problems, including sleep troubles and eating disorders, using the self-reported information about employment in the EHIS2 database³: self-declared labour status, status in employment, full-time/part-time work, economic sector in employment and occupation in employment⁴. Of the EHIS2 sample, we consider only those who self-declared employed and, among them, those who self-declared to be employees with a permanent job/ work contract of unlimited duration and to have a full-time work⁵; for this sample, we investigate the role that their employment status (permanent and full-time employees) have on their mental health variables, controlling for gender, socio-economic status, tighter (marital status⁶, social network) and looser (degree of urbanization of the area in which the individual lives, geographical area) socio-environmental variables and health status.

Our paper contributes to the increasing interest towards the relationship between employment and mental health taking into account the Italian case⁷.

This paper is structured as follows: in section 2, we will outline the literature on the relationship between employment and mental health variables. In section 3, we will describe the Italian case and the data and the variables taken into account; in section 4, we will focus on the empirical design; in section 5, we will present the main empirical findings on the relationship between the employment and mental health variables; in section 6, we will provide some robustness checks. Discussion of the results and conclusions are in the last section.

2. The relationship between employment and health in the economic literature

³We are well aware that, because of its main aim, the EHIS2 Database does not provide the detailed information usually collected through labour market surveys (i.e. working hours, working conditions, etc.) but, in our opinion, albeit with this limitation, the relationship between employment and mental health using EHIS microdata keeps its interest.

⁴The EHIS2 variables we used are self-declared labour status (i.e. carries out a job or profession, including unpaid work for a family business or holding an apprenticeship or paid traineeship, etc.), status in employment (i.e. employee with a permanent job/work contract of unlimited duration), full-time work, economic sector in employment (i.e. NACE code; see sections 2 in EHIS2 survey), occupation in employment (see ISCO-08 coded at 2-digit level).

⁵ In order to reduce the problems of endogeneity and/or problems of direct causality we consider only full-time permanent employees individuals in a specific economic sector/occupation, even if we do not know whether this occupation is the result of a choice or not, his/her work history, working conditions and more detailed information usually collected through labour surveys.

⁶ We consider only the variable legal marital status (MARSTALEGAL=2: Married or in a registered partnership).

⁷ Since 2013 OECD published ten reports looking at how the broader education, health, social and labour market policies are being tackled in this relationship: Australia, Austria, Belgium, Denmark, Netherlands, New Zealand, Norway, Sweden, Switzerland and United Kingdom. A report on the Italian situation has not yet been published by the OECD.

Recently, OECD (2019, ch.2, p. 46) considers again the bidirectional relationship between health and employment, paying particular attention to both physical and mental health. Several recent studies, based on longitudinal data, provide evidence of the direct impact of the health status on employment prospects (OECD, 2017; Devaux and Sassi, 2013; OECD, 2016): chronic diseases (such as cardiovascular diseases, respiratory problems, diabetes, and serious mental health conditions) as well as risk factors (smoking, obesity) have important labour market impacts in terms of reduced employment, earlier retirement, higher number of sick leave and lower income. The literature also provides evidence of reverse causality, running from work to health: employment (e.g. employment status, working hours) and working conditions (e.g. job decision latitude, job demand, and job strains) influence both people's physical and mental health (James, Devaux and Sassi, 2017).

The relationship between employment and health is the subject of several research studies, but the economic literature on this relationship is not so huge as in other disciplines such as sociology, epidemiology and psychology because causal mechanisms are difficult to identify and subjective variables are difficult to study (Bassanini and Caroli, 2015; Barnay, 2016). The same difficulty arises in analyzing the relationship between mental health and employment: mental health problems cause reduced work productivity and increase in unemployment and sick leaves. This relationship is bidirectional and thus leads to reverse causality problems (Barnay, 2016), from work to mental health. Employment has evident positive effects on people's mental health by providing social status, income security, a time structure, a sense of identity and achievement and a source of self-esteem, while also enabling social contact. As such, work is a key factor for social inclusion and it is not surprising that most inactive people with a mental disorder also express a desire to obtain employment; but the quality of work plays a key role (OECD, 2012, p. 40). Job satisfaction is an important moderating variable for the mental health effects of employment; jobs in which workers have high job satisfaction enhance personal growth, self-esteem and mental health, but jobs with low satisfaction can be detrimental to mental health and as bad as being unemployed (Winefield et al., 2002). These differences are important in view of different working conditions in different occupations and different mechanisms between the work environment, work-related stress and mental health.

There could be other factors related to both mental health and employment such as risk preferences (Zhang et al., 2009), workers' involvement at work and the ability to give satisfaction (Nelson and Kim, 2008), personality traits, family background (Banerjee et al., 2017) and risky health behaviours (smoking, alcohol and overweight), which in most household surveys remain unobservable acting as confounders.

In recent years, the economic crisis raised unemployment, highlighting the need to study in depth the link between unemployment and health. Having a job is associated with better mental health outcomes than being unemployed. This conclusion holds for people with and without mental disorder (OECD, 2012, p. 55). On average, people who are unemployed have almost twice the prevalence of mental health problems than those who are employed (OECD, 2012, p. 40). These findings are consistent with various studies that have established the presence of a higher incidence of mental health problems, and lower levels of "well-being" among the unemployed (Clark, 2003; Alonso *et al.*, 2004; Shields and Wheatly Price, 2005; Baumeister and Härter, 2007).

Unemployment invariably results in adverse impacts on the mental health of workers and newly unemployed. Barnes et al. (2009), using the British Household Panel Survey,

investigate the effect of two recession years (1991 and 2008) on negative social outcomes such as depression. The results show that in both recessionary periods people who lost their jobs were more likely to suffer from depression in the shorter-term than people who remained employed. Moreover, females are found to be more vulnerable to longer-term risks of depression as a result of job loss in an economic recession.

Farré (2018) lists at least three different mechanisms which can lead to observe that unemployed workers are less healthy than employed ones. Firstly, ill workers more likely become unemployed (Bockerman and Ilmakunnas 2009; Garcia-Gomez et al. 2010); secondly, poor health causes longer unemployment spells (Stewart, 2001); thirdly, unemployment itself can negatively affect health and well-being through monetary and non-monetary costs (Mossakowski, 2009).

From this literature, clearly emerges that mental health is *a key dimension of our all lives* (Layard, 2013, p. 1), even if there are many methodological problems in establishing the role that mental health has in employment. Barnay and Defebvre (2019) underline that health indicators are characterized by justification biases⁸ and measurement errors as well as social heterogeneity⁹ (Akashi-Ronquest et al. 2011, Etilé and Milcent, 2006, Shmueli, 2003) and that, as with physical health status, selection effect are also at work.

3. Mental health and employment in Italy

As said in the Introduction, the Second Wave of European Health Interview Survey (EHIS2) collects main labour market information and includes the Patient Health Questionnaire depression scale – PHQ-8 (Kroenke and Spitzer 2002) – which permits identification of individuals who presently suffer from depression.

Data about mental health from EHIS2 show that in Italy the rate of individuals (with more than 15 years) suffering from any depression is 4,3% (UE 6,8%), while the rate of those suffering from major depression is 1,6% (UE 2,8%) (Alleva, 2017, p. 12 -13).

We will consider the Italian case, where the data about individuals suffering from mental health problems (as percentage of the entire sample N=10727) are the following: low interest (2%), depression (2%), sleep disorders (5%), tiredness (5%), eating disorders (2%), sense of failure (1%), low concentration (1%) and slow moving/speaking (1%), while 54% of the entire sample declares as employment status to be an employee with permanent job/work contract of unlimited duration and full-time job.

Nevertheless, it is interesting underline that in Italy 5% of the sample has had sleep troubles, that is trouble falling or staying asleep, or sleeping too much over the last two weeks, higher than 2% due to depression. Both of them are mental health variables in the EHIS2; in our opinion, sleep troubles a fairly new phenomenon in Italy that deserves to be explored.

3.1 Data and Variables

Table 1 of the Appendix defines the EHIS2 variables variables used in our empirical analysis, while Table 2 of the Appendix describes the statistics of these variables. In both tables, there is a composite indicator so called “overall mental health” (MH) taking value

⁸ Individuals may alter their health status declarations (Zhang et al., 2009; Lindeboom and Kerkhofs, 2009; Gannon, 2009).

⁹ The same objective health status is reported differently, depending on individual characteristics such as gender, age or general health status.

1 if individual has suffered from at least one problem of mental health in the last two weeks, 0 otherwise.

For the sake of clarity and brevity, we only illustrate the statistics that consider the entire sample of individuals between 25–64 years. The statistics confirm that a low percentage of individuals (ranging from 1% to 5%) has mental health problems; as said before, it is interesting underline that the in Italy 5% of the sample has had sleep troubles, that is trouble falling or staying asleep, or sleeping too much over the last two weeks, higher than 2% due to depression. 46% attained a high level of education, while 52% have a high family income. The majority (79%) lives in medium-type dwellings. Moreover, a very low percentage claim serious anxiety and chronic disease problems (about 2%) but about 42% of individuals are overweight and experience obesity problems. More than half of individuals assert to be legally married or in a registered partnership (57%) and to be an employee with permanent and full-time job (54%) while a very high percentage of individuals (98%) declare that they have been helped by multiple persons (more than 2) with their personal problems, thus establishing very strong social networks. Finally, most of individuals (43%) live in medium level of urbanization areas. Comparing Southern to Northern regions, it is possible to observe that there are differences in the rates of individuals which are married, low income, overweight/obese, living in an highly urbanized area: they are higher in the South. There is no substantial difference between the Italian regions as far as concerns the eight mental health variables, except that the percentage of individuals suffering from sleep troubles is higher in the Northern regions (6%) than in the Southern ones (4%).

Because of methodological problems (i.e. measurements problems, omitted variable bias and reverse causality), the causality mechanism between mental health and employment is not clear. Because of the unavailability of longitudinal observations and of reliable instrumental variables, we first analyse the correlations between study variables taking into account gender, education, employment status (employee with permanent and full-time job), income, type of dwelling, weight status, health status (chronic disease, chronic anxiety), marital status, social network, the degree of urbanization and, finally, the macro area in which the individual lives. The Pearson correlations between study variables are shown in Table 3 of the Appendix.

We found that females suffer more than males from mental health problems: gender plays a role as reported in most of the literature (Blehar and Oren 1995; Costa-Font and Gil 2006).

There is a positive association between depression, sleep troubles, tiredness and a low level of education; a positive association between depression, low concentration when there is a medium level of education. This could be due to indirect effects through occupation, job satisfaction, income, etc.

The association between eating disorders is negative in the case of high type of dwelling (proxy of the wealth of individuals): in luxurious homes live individuals with lower mental health problems; in case of low type of dwelling there is instead a positive association with depression, sense of failure and low concentration.

We found a negative association between employment status (employee with permanent job/work of unlimited duration and full-time work) and depression.

We found a positive association between weight status and eating disorders. It is interesting to underline that obesity associated to eating disorders raises problems when the individuals are still investing in their education (Stroebele et al. 2013).

There is a negative association between two mental health variables (low interest and depression) and having a social network to count on in case of difficulty: wider the social network, lower the probability of having mental health problems. Also, a negative association there is between marital status and two mental health variables (low interest and depression).

It emerges that different mental health variables result significantly associated to different degrees of urbanization, with different sign. There is a negative association between all the mental health variables and intermediate degrees of urbanization; there is a positive association between sleep troubles, low concentration and a high degree of urbanization.

Moreover, considering looser socio-environmental variables, for the individuals it emerges a positive association between sleep troubles and the living area (the North, that is North-West and North-East).

Finally, mental health, as expected, is positively associated to health status variable¹⁰ (chronic diseases and chronic anxiety).

4. Empirical Design

In order to analyse the relationship between employment status and mental health, we assess an econometric model using a “Linear regression model with a large dummy-variable set” (LRLDMS). This model is particularly suitable in our case, since there are a lot of dummy variables with many groups (related to age classes). Moreover, this approach is designed for datasets with many groups, but not a number of groups that increases with the sample size.

We are conscious that there are several caveats to take into account using EHIS2 microdata: information used for building our variable employment status are self-reported as well as those about height, the eight mental health variables (low interest, depression, sleep troubles, tiredness, eating disorders, sense of failure, low concentration, slow moving/speaking) and health status variables (chronic disease and chronic anxiety); furthermore, the data are cross-section. Nevertheless, we are interested to underline that EHIS2 provides new and useful information in the study of the association between employment status and mental health variables.

In particular, our model tries to assess the role that the employment status of an individual i has on his/her mental health variables, controlling for some specific characteristics of individual i . Formally and using a general framework, the LRLDMS model is described as follows:

$$Mental\ health_i = a + b_1 Employment - status_i + c_i Controls_i + \varepsilon_i \quad (1)$$

where *Mental Health* is the vector of different mental health indicators¹¹; *Employment status* stands for employees with permanent job/work of unlimited duration and full-time

¹⁰ It is worth recalling that Costa-Font and Gil (2006) did not have “anxiety” as variable but captured it through smoking.

work; *Controls* represents the vector of four types of characteristics: a) *Individual* (gender [males and females; females as benchmark group], education [high vs. low; low as benchmark group], source of income (high vs low; low as benchmark group), type of dwelling (high vs. low; low as benchmark group), weight status; b) *Socio-environment* (tighter ones [social network and marital status] and looser ones, i.e. macro regions of Italy (North-East, North-West, Centre, South & Islands; South & Islands as benchmark group) where the individual lives and urbanization (densely-populated area, medium-populated area, low-populated area; high as benchmark group)); c) *Health status* represents the vector of some health status variables: [chronic anxiety, chronic disease] (see Table 1 of the Appendix for more details about the description/definition of these variables, while Table 2 of the Appendix for more details about statistics of these variables); d) *economic sector in employment and occupation* (economic sector [primary, secondary (building and energy & manufacturing), tertiary; primary as benchmark group), (public and private; private as benchmark group), and occupation [managers, executives, workers and other position: other as benchmark group]). These factors have a role on the mental health of individual i ; b_i and c_i are parameter vectors; and ε_i are error terms, which are assumed to be clustered and bootstrapped with 2000 replications.

5. Empirical Evidence: The relationship between the employment status and mental health

In this section, we present the main results analysing the relationship between the employment status and mental health of the entire sample of individuals between 25–64 years (Table 4 of the Appendix), where Overall Mental Health (MH) is a composite indicator taking value 1 if individual has suffered from at least one problem of mental health in the last two weeks, 0 otherwise.

Firstly, we observe that, as expected, the employment status plays an important role in the overall MH (column 9): an employee with permanent job/work contract of unlimited duration and full-time job have a lower probability of suffering from mental health problems compared to employees without permanent and full-time job.

Secondly, the Energy & Manufacturing sector raises the probability of suffering from overall MH problems compared to primary sector; analysing each mental health variable, we noticed that sleep troubles and sense of failure have positive and significant coefficients while depression (weakly statistically significant, $p < 10\%$), eating disorders and low concentration (weakly statistically significant, $p < 10\%$) negative ones. In both private and public tertiary sector, the MH variables sleep troubles and sense of failure have positive and significant coefficients while eating disorders and low concentration are significant with a negative sign.

Thirdly, we observe the role of occupation on the overall MH: managers have a lower probability of suffering from MH problems. But looking at each MH variable it is possible to observe that:

¹¹ The eight mental health variables in EHIS2 are: (1) Little interest or pleasure in doing things over the last two weeks (low interest); (2) Feeling down, depressed, or hopeless over the last two weeks (depression); (3) Having trouble falling or staying asleep, or sleeping too much over the last two weeks (sleep disorders); (4) Feeling tired or having little energy over the last two weeks (tiredness); (5) Having poor appetite or overeating over the last two weeks (eating disorders); (6) Feeling bad about yourself, feeling like a failure over the last two weeks (sense of failure); (7) Having trouble concentrating on things, such as reading the newspaper or watching television, over the last two weeks (low concentration); (8) Noticeably moving or speaking very slowly, or being noticeably fidgety or restless, over the last two weeks (slow moving/speaking).

- a) managers with higher probability suffer from sleep troubles while with lower probability suffer from depression, eating disorders, sense of failure and low concentration with respect to other position;
- b) executives with lower probability suffer from low interest, eating disorders and sense of failure with respect to other position, moving/slow speaking;
- c) workers with higher probability suffer from depression (weakly statistically significant, $p < 10\%$), tiredness and slow moving/slow speaking with respect to other position, while with lower probability suffer from low interest, sleep troubles and eating disorders.

There are other interesting results looking at the individual and socio-environmental variables. Weight status raises the likelihood of suffering from all the mental health variables. Individuals who live in luxurious homes have a lower incidence of overall MH problems, where the type of dwelling could be considered as a proxy of wealth; the wealthier an individual is, the lower the probability of having overall MH problems. There is a tighter socio-environmental variable which seems to protect the individual from overall MH problems: having a social network to count on in case of difficulty. In particular, having a social network is a protective factor against low interest and depression.

As far as concerns the urbanization levels, a high level of urbanization raises the probability of having overall MH problems.

Finally, health status variables, as expected, explain part of the variability of mental health: individuals with chronic disease and severe chronic anxiety increased the likelihood of suffering from all mental health problems.

The predictability of our model varies from 3 % to 13 % (see adj. R^2 indicator in the Table 4 of the Appendix). In other words, the variability of the analyzed phenomenon is explained only for 3%-13 %.

6. Robustness checks

In order to make our results more reliable and to further examine whether empirical evidence is confirmed, several robustness checks are performed. In particular, we face and address the heterogeneity problems (grouping by gender, i.e. males and females) and the economic dualism between the Italian regions (i.e. grouping by geographical areas, i.e. Northern, Central and Southern regions). In Table 5 of the Appendix are reported the results. We only analyse the role that employment has on the overall mental health indicator (MH). As specified in Table 1 of the Appendix, this indicator allows us to capture all the components of mental health.

Firstly, for Central regions, we find that having a permanent and full-time job reduces the probability of suffering from mental health problems; both for Northern and Southern regions we find that highly urbanized area where the individual lives raises the probability of having mental health problems. Weight status increases the probability of suffering from mental health problems in all the regions.

There are some interesting gender differences: medium and high level of education increase for females the probability of having mental health problems, while medium and high level of education reduce it for males. High income increases for males the probability of having mental health problems while reduces it for females (weakly statistically significant, $p < 10\%$). Males with higher probability suffer from overall MH if

marital status is taken into account, while a wide social network seems to be an important factor for females to reduce their mental health problems. Furthermore, in all economic sectors, males suffer less from overall MH compared to the females who instead suffer more. For females this could be due to economic and/or social reasons (i.e. lower wages/job satisfaction, gender discrimination, difficulties in reconciling work and family life; ISTAT, 2019). Similarly, female managers suffer more from overall MH compared to the male ones confirming that gender differences in the mental health problems do exist also at work.

About the economic dualism that exists between the Italian, the estimates suggest that marital status raises the probability of having mental health problems, more in the Southern regions than in the Northern ones. A narrow social network seems to be an important factor in order to raise mental health problems in the Northern regions while weight status increases the probability of having mental health problems more in the Southern regions than in the Northern ones.

Finally, we also test if there exists an important link between the occupation and economic sector of employment in order to explain difference in mental health (in Table 6 of the Appendix are reported the results). In other words, we include in the regression the interaction between occupation and economic sector of employment.

The results show that in these interactions:

- 1) the executives in all sectors, both males and females (except of the Energy & Manufacturing sector), more likely suffer from mental health problems;
- 2) in the public tertiary sector female workers more likely suffer from mental health problems;
- 3) individuals in the Southern regions suffer more from mental health problems while individuals in the Northern regions suffer less.

7. Discussion and Conclusions

The main results on the relationship between the employment and mental health (MH) of the entire sample of individuals between 25–64 years show firstly that employment status (employee with a permanent and full-time job) reduces the probability of suffering from mental health problems compared to employees without a permanent and full time job.

Secondly, the Energy & Manufacturing sector raises the probability of suffering from overall MH problems. EHIS2 microdata shed light on the role played by mental health variables in each economic sector: we noticed that sleep troubles and sense of failure have positive and significant coefficients while depression (weakly statistically significant, $p < 10\%$), eating disorders and low concentration (weakly statistically significant, $p < 10\%$) negative ones. In both private and public tertiary sector, the MH variables sleep troubles and sense of failure have positive and significant coefficients while eating disorders and low concentration are significant with a negative sign. These results seem partly to confirm the OECD hypothesis (2012): the mental health of those at work is also likely to suffer as a result of an increase in economic restructuring and job insecurity.

Thirdly, we observe that managers have a lower probability of suffering from MH problems. This result is in line with the results found by Llana-Nozal et al. (2004); they found that mental health appears to be better at higher occupational skill levels (professional/managerial and skilled non-manual), than at the skilled manual and the

partly skilled/unskilled levels. But looking at each MH variable it is possible to observe that:

- 1) managers with higher probability suffer from sleep troubles while with lower probability suffer from depression, eating disorders, sense of failure and low concentration compared to other position;
- 2) executives with lower probability suffer from low interest, eating disorders and sense of failure while with higher probability from tiredness, low concentration and slow moving/slow speaking compared to other position;
- 3) workers with higher probability suffer from depression (weakly statistically significant, $p < 10\%$), tiredness and slow moving/slow speaking compared to other position, while with lower probability suffer from low interest, sleep troubles and eating disorders.

There are other interesting results looking at the individual and socio-environmental variables:

- weight status raises the probability of suffering from all the mental health variables (for sleep disorders this result in line with the literature, i.e Must and Evans, 2011);
- individuals who live in luxurious homes have a lower incidence of MH problems, where the type of dwelling could be considered as a proxy of wealth; the wealthier an individual is, the lower the probability of having MH problems;
- having a wide social network reduces the probability of suffering from depression and low interest;
- a high level of urbanization raises the probability of having overall MH problems.
- as expected, health status variables explain part of the variability of mental health: individuals with chronic disease and severe chronic anxiety have an increased likelihood of suffering from all mental health problems.

The results seem to confirm that in Italy there are gender differences in mental health problems, with males suffering less from overall MH compared to the females. For females, this could be due to economic and/or social reasons (i.e. lower wages/job satisfaction, gender discrimination, difficulties in reconciling work and family life; ISTAT, 2019). We find that males with higher probability suffer from overall MH if marital status is taken into account, while a wide social network seems to be an important factor for females to reduce their mental health problems. Medium and high level of education increase for females the probability of having mental health problems, while medium and high level of education reduce it for males. High income increases for males the probability of having mental health problems, while reduces it for females (weakly statistically significant, $p < 10\%$). Similarly, in all economic sectors, males suffer less from overall MH compared to the females who instead suffer more. Our results confirm that gender plays a relevant role because females suffer more than males from mental health problems (Blehar and Oren, 1995)

There are results about the economic dualism that exists in Italy between Southern and Northern regions. The estimates suggest that having a high level of education increases the probability of suffering from mental health in the Southern regions; a narrow social network seems to be an important factor in order to increase mental health problems in the

Northern regions while weight status increases the probability of having mental health problems more in the Southern regions than in the Northern ones.

Albeit with the limitations discussed in the paper, the results we obtained by analyzing the relationship between mental health problems and employment in Italy underline the key dimension of mental health of our all lives (Layard, 2013).

References

- Alleva, G., 2017. La salute mentale in Italia: cosa ci dicono i dati dell'Istat, XXI Congresso della Società Italiana di Psicopatologia, Roma 22 Febbraio 2017;
- Alonso, J., Angermeyer, M.C., Bernert, S., *et al.*, 2004. Results from the European Study of the Epidemiology of Mental Disorders (ESEMED) Project, *Acta Psychiatrica Scandinavica*, Suppl. 420, 21-54 [doi: 10.1111/j.1600-0047.2004.00330.x](https://doi.org/10.1111/j.1600-0047.2004.00330.x).
- Akashi-Ronquest, N., Carrillo, P., Dembling, B., Stern, S., 2011. Measuring the Biases in Self- Reported Disability Status: Evidence from Aggregate Data, *Applied Economics Letters*, 18: 1053–1060, <https://doi.org/10.1080/13504851.2010.524603>
- Antillón, M., Lauderdale, D.S., Mullahy, J., 2014. Sleep behaviour and unemployment conditions, *Economics and Human Biology*, 14, 22 -32; [doi: 10.1016/j.ehb.2014.03.003](https://doi.org/10.1016/j.ehb.2014.03.003).
- Banerjee, S., Chatterji, P., Lahiri, K., 2017. Effects of Psychiatric Disorders on Labor Market Outcomes: A Latent Variable Approach Using Multiple Clinical Indicators: Psychiatric Disorders and Labor Market Outcomes, *Health Economics*, 26: 184–205; [DOI: 10.1002/hec.3286](https://doi.org/10.1002/hec.3286) ;
- Barnes, M., Mansour, A., Tomaszewski, W., Oroyemi, P., 2009. Social Impact of Recession: The Impact of Job Loss and Job Insecurity on Social Disadvantage, Social Exclusion Task Force, Cabinet Office, United Kingdom;
- Barnay, T., 2016. Health, work and working conditions: a review of the economic literature, *European Journal of Health Economics*, 17, 693 – 709, [DOI 10.1007/s10198-015-0715-8](https://doi.org/10.1007/s10198-015-0715-8);
- Barnay, T., Defebvre, E., 2019. Gender Differences in the Influence of Mental Health on Job Retention, *Labour*, 33 (4), 507 -532, [DOI: 10.1111/labr.12154](https://doi.org/10.1111/labr.12154);
- Bassanini, A., Caroli, E., 2015. Is work bad for Health? the role of constraint vs. choice, *Annals of Economics and Statistics*, n. 119/120, Special Issue on Health and Labour Economics, Dec., 13 -37 [doi:10.15609/annaeconstat2009.119-120.13](https://doi.org/10.15609/annaeconstat2009.119-120.13)
- Baumeister, H., Härter, M., 2007. Mental Disorders in Patients with Obesity in Comparison with Healthy Proband, *International Journal of Obesity*, 31, (7), 1155-1164;
- Blehar, M.D., Oren, D.A., 1995. Women's increased vulnerability to mood disorders: Integrating psychobiology and epidemiology, *Depression*, 3, 3-12; <https://doi.org/10.1002/depr.3050030103>
- Böckerman, P., Ilmakunnas, P., 2009. Unemployment and self-assessed health: Evidence from Panel Data, *Health Economics*, 18, 161–179; [doi: 10.1002/hec.1361](https://doi.org/10.1002/hec.1361).
- Clark, A.E., 2003. Unemployment as a Social Norm: Psychological Evidence from Panel Data, *Journal of Labor Economics*, 21 (2), 323-351, [DOI: 10.1086/345559](https://doi.org/10.1086/345559)

- Costa-Font, J., Gil, J., 2006. Revisiting the ‘Fat and Jolly’ hypothesis: socio-environmental determinants of obesity and depression in Spain, *Socio-Economic Review*, 4, 513-542. <https://doi.org/10.1093/ser/mwl018>
- Baumeister, H., Härter, M., 2007. Mental Disorders in Patients with Obesity in Comparison with Healthy Probands, *International Journal of Obesity*, 031, 7, p. 1155-1164.
- Devaux, M., Sassi, F., 2013. Social inequalities in obesity and overweight in 11 OECD countries, *European Journal of Public Health*, <http://dx.doi.org/10.1093/eurpub/ckr058>
- Etilé, F., Milcent, C., 2006. Income-related Reporting Heterogeneity in Self-assessed Health: Evidence from France, *Health Economics*, 15, 965–981; [doi: 10.1002/hec.1164](https://doi.org/10.1002/hec.1164).
- Farré, L., Fasani, F., Mueller, H., 2018. Feeling useless: the effect of unemployment on mental health in the Great Recession, *IZA Journal of Labor Economics*, 7:8, <https://doi.org/10.1186/s40172-018-0068-5>
- Gannon, B., 2009. The influence of Economic Incentives on Reported Disability Status, *Health Economics*, 18, 743- 759; <https://doi.org/10.1002/hec.1399>
- García-Gómez, P., Jones, A.M., Rice, N., 2010. Health effects on labor market exits and entries, *Labour Economics*, 17, 1, 62–76; doi.org/10.1016/j.labeco.2009.04.004
- Hintzpeter, B., Finger, J.D., Allen, J., Kuhnert, R., Seeling, S., Thelen, J., Lange, C., 2019. European Health Interview Survey (EHIS) 2 – Background and study methodology, *Journal of Health Monitoring*, 4(4), pp. 66 – 79, DOI [10.25646/6228](https://doi.org/10.25646/6228);
- ISTAT. 2019. *Conciliazione tra lavoro e famiglia*, 2018, Rome;
- James, C., Devaux, M., Sassi, F., 2017. Inclusive growth and health, *OECD Health Working Papers*, No. 103, OECD Publishing, Paris, <https://dx.doi.org/10.1787/93d52bcd-en>.
- Layard, R., 2013. Mental health: the new frontier for labour economics, *IZA Journal of Labor Policy*, 2:2, <http://www.izajolp.com/content/2/1/2>;
- Layard, R., 2015. A New Priority for Mental Health, CEP 2015 Election Analyses Series, CEP LSE, London;
- Lindeboom, M., Kerkhofs, M., 2009. Health and Work of the Elderly: Subjective Health Measures, Reporting Errors and Endogeneity between Health and Work, *Journal of Applied Econometrics*, 24, 1024- 1046; <https://doi.org/10.1002/jae.1077>
- Layard, R., 2016. The economics of mental health, *IZA World of Labor*, 321;
- Llena-Nozal, A., Lindeboom, M., Portrait, F., 2004. The effect of work on mental health: does occupation matter? *Health Economics*, 13, 1045 -1062; DOI: [10.1002/hec.929](https://doi.org/10.1002/hec.929)
- Mossakowski, K. N., 2009. The Influence of Past Unemployment Duration on Symptoms of Depression Among Young Women and Men in the United States, *American Journal of Public Health*, 99, 1826–1832; [doi: 10.2105/AJPH.2008.152561](https://doi.org/10.2105/AJPH.2008.152561)
- Must, A., Evans, W., 2011. The Epidemiology of Obesity in Cawley J. (ed.) *The Oxford Handbook of the Social Science of Obesity*, Oxford University Press, [10.1093/oxfordhb/9780199736362.013.0002](https://doi.org/10.1093/oxfordhb/9780199736362.013.0002)

- Nelson, R. E., Kim, J. W., 2008. Survival of the Fittest: Impact of Mental Illness on Employment Duration, *Pharmacotherapy Outcomes Working Paper*, Research Center, University of Utah;
- OECD, 2012. *Sick on the Job? Myths and Realities about Mental Health and Work*, Mental Health and Work, OECD Publishing. <http://dx.doi.org/10.1787/9789264124523-en>
- OECD, 2016. The labour market of ill-health in *Health at a Glance: Europe 2016: State of Health in the EU Cycle*, OECD Publishing, Paris https://dx.doi.org/10.1787/health_glance_eur-2016-4-en.
- OECD, 2017. *Preventing Ageing Unequally*, OECD Publishing, Paris <https://dx.doi.org/10.1787/9789264279087-en>.
- OECD/EU, 2018. *Health at a Glance: Europe 2018: State of Health in the EU Cycle*, OECD Publishing, Paris. https://doi.org/10.1787/health_glance_eur-2018-en
- OECD, 2019. *Health for Everyone? Social Inequalities in Health and Health Systems*, OECD Health Policy Studies, OECD Publishing, Paris, <https://doi.org/10.1787/3c8385d0-en>.
- Shmueli, A., 2003. Socio-economic and Demographic Variation in Health and in its Measures: The Issue of Reporting Heterogeneity, *Social Science and Medicine*, 57, 125–134. [doi.org/10.1016/S0277-9536\(02\)00333-7](https://doi.org/10.1016/S0277-9536(02)00333-7)
- Shields, M.A., Wheatley Price, S., 2005. Exploring the Economic and Social Determinants of Psychological well-being and Perceived Social Support in England, *Journal of the Royal Statistical Society, Series A*, 168, 513-538; <https://doi.org/10.1111/j.1467-985X.2005.00361.x>
- Stewart, J.M., 2001. The impact of health status on the duration of unemployment spells and the implications for studies of the impact of unemployment on health status, *Journal of Health Economics*, 20, 5, 781–796; [doi: 10.1016/S0167-6296\(01\)00087-X](https://doi.org/10.1016/S0167-6296(01)00087-X)
- Winefield, A.H., Montgomery, B., Gault, U., Muller, J., O’Gorman, J., Reser, J., Roland, D., 2002. The Psychology of Work and Unemployment in Australia Today, *Australian Psychologist*, 37 (1), pp. 1-9. <https://doi.org/10.1080/00050060210001706606>
- World Health Organization, 1946. Constitution of the World Health Organization, Geneva.
- World Health Organization, 2007. Mental Health: Strengthening Mental Health Promotion, *Fact Sheet* No. 220, World Health Organization, Geneva.
- World Health Organization, 2014 World Health Organization and the Calouste Gulbenkian Foundation (2014). *Social determinants of mental health*, Geneva.
- Zhang, X., Zhao, X., Harris, A., 2009. Chronic Diseases and Labour Force Participation in Australia, *Journal of Health Economics*, 28: 91–108. [DOI: 10.1016/j.jhealeco.2008.08.001](https://doi.org/10.1016/j.jhealeco.2008.08.001)

Table 1. Definition of the EHIS2 variables

Variables (N=10727)	Symbol	Definition
Overall mental health	MH	Variable taking value 1 if the individual has suffered from at least one problem of mental health in the last two weeks, 0 otherwise
Low interest	LI	Variable taking value 1 if the individual has little interest or pleasure in doing things over the last 2 weeks, 0 otherwise
Depression	DEP	Variable taking value 1 if the individual feels down, depressed or hopeless over the last 2 weeks, 0 otherwise
Sleep disorders	SD	Variable taking value 1 if the individual has trouble falling or staying asleep, or sleeping too much over the last 2 weeks, 0 otherwise
Tiredness	TR	Variable taking value 1 if the individual feels tired or has little energy over the last 2 weeks, 0 otherwise
Eating disorders	ED	Variable taking value 1 if the individual has poor appetite or overeating over the last 2 weeks, 0 otherwise
Sense of failure	SF	Variable taking value 1 if the individual feels bad about himself/herself, feels being a failure over the last 2 weeks, 0 otherwise
Low concentration	LC	Variable taking value 1 if the individual has trouble concentrating on things over the last 2 weeks, 0 otherwise
Slow moving/speaking	SM_S	Variable taking value 1 if the individual has slow moving/speaking over the last 2 weeks, 0 otherwise
Employment status	EMP	Variable taking value 1 if the individual is a full-time permanent employee, 0 otherwise
Weight status	BMI	Variable taking value 1 if the individual is overweight (obese and overweight), 0 otherwise
Education level (low)	EDU (L)	Variable taking value 1 if the individual has low level of education (none, primary education, lower secondary education), 0 otherwise
Education level (med)	EDU (M)	Variable taking value 1 if the individual has medium level of education (upper secondary, post-secondary but not tertiary education), 0 otherwise
Education level (high)	EDU (H)	Variable taking value 1 if the individual has high level of education (tertiary education), 0 otherwise
Males	ML	Variable taking value 1 if the individual is male, 0 otherwise
Females	FM	Variable taking value 1 if the individual is female, 0 otherwise
Source of income (low)	SI (L)	Variable taking value 1 if the individual has low source of income (1° tertile), 0 otherwise
Source of income (med)	SI (M)	Variable taking value 1 if the individual has medium source of income (2° tertile), 0 otherwise
Source of income (high)	SI (H)	Variable taking value 1 if the individual has high source of income, 0 oth (3° tertile) erwise
Urban area (low)	URB (L)	Variable taking value 1 if the individual lives in thinly-populated area (low degree of urbanization), 0 otherwise
Urban area (med)	URB (M)	Variable taking value 1 if the individual lives in intermediate-populated area (medium degree of urbanization), 0 otherwise
Urban area (high)	URB (H)	Variable taking value 1 if the individual lives in a densely-populated area (high degree of urbanization), 0 otherwise

Table 1 (cont.)		
Variables (N=10727)	Symbol	Definition
Social network	SN	Variable taking value 1 if the individual has a social network (individual could count on more than 2 people for personal problems), 0 otherwise (less than 2 people)
Legal marital status	MS	Variable taking value 1 if the individual is married or in a registered partnership, 0 otherwise
Chronic diseases	CD	Variable taking value 1 if the individual has chronic diseases, 0 otherwise
Chronic anxiety	CAN	Variable taking value 1 if the individual has chronic anxiety, 0 otherwise
Type of dwelling (low)	TD (L)	Variable taking value 1 if the individual lives in a low type of dwelling (low), 0 otherwise
Type of dwelling (med)	TD (M)	Variable taking value 1 if the individual lives in a medium type of dwelling (medium), 0 otherwise
Type of dwelling (high)	TD (H)	Variable taking value 1 if the individual lives in a high type of dwelling (high), 0 otherwise
Northern regions	NO	Variable taking value 1 if the individual lives in a Northern region, 0 otherwise
Centre regions	CE	Variable taking value 1 if the individual lives in a Centre region, 0 otherwise
Southern regions/Islands	ST_IS	Variable taking value 1 if the individual lives in a Southern region/Islands, 0 otherwise
Primary sector	PS	Variable taking value 1 if the individual belongs to the primary sector, 0 otherwise
Building sector	BS	Variable taking value 1 if the individual belongs to the building sector, 0 otherwise
Energy & Mssector	ES	Variable taking value 1 if the individual belongs to the energy sector, 0 otherwise
Tertiary sector (private)	TS_PRIV	Variable taking value 1 if the individual belongs to the tertiary sector (private), 0 otherwise
Tertiary sector (public)	TS_PUB	Variable taking value 1 if the individual belongs to the tertiary sector (public), 0 otherwise
Manager	MANAG	Variable taking value 1 if the individual is a manager, 0 otherwise
Executive	EXEC	Variable taking value 1 if the individual is an executive, 0 otherwise
Worker	WOR	Variable taking value 1 if the individual is a worker, 0 otherwise
Other position	OTH	Variable taking value 1 if the individual has other position, 0 otherwise

Source: own elaboration on the Italian “EHIS2” microdata for 2015 wave.

Table 2. Summary Statistics of the EHIS2 variables

Regressors	Symbol	All sample	Males	Females	Northern		Centre		Southern	
					Regions	Regions	Regions	Regions	Regions	Regions
Overall mental health	MH	0.10 (0.30)	0.08 (0.27)	0.13 (0.34)	0.11 (0.31)	0.10 (0.30)	0.10 (0.30)	0.08 (0.27)		
Low interest	LI	0.02 (0.14)	0.01 (0.11)	0.03 (0.16)	0.02 (0.14)	0.02 (0.14)	0.02 (0.14)	0.02 (0.13)		
Depression	DEP	0.02 (0.13)	0.01 (0.11)	0.02 (0.14)	0.01 (0.14)	0.01 (0.14)	0.02 (0.14)	0.02 (0.12)		
Sleep troubles	SD	0.05 (0.22)	0.04 (0.19)	0.07 (0.26)	0.06 (0.23)	0.05 (0.23)	0.05 (0.23)	0.04 (0.20)		
Tiredness	TR	0.05 (0.22)	0.04 (0.18)	0.07 (0.26)	0.05 (0.23)	0.05 (0.23)	0.05 (0.22)	0.05 (0.21)		
Eating disorders	ED	0.02 (0.13)	0.01 (0.11)	0.02 (0.16)	0.02 (0.14)	0.02 (0.13)	0.02 (0.13)	0.02 (0.13)		
Sense of failure	SF	0.01 (0.11)	0.01 (0.09)	0.02 (0.13)	0.01 (0.11)	0.01 (0.11)	0.01 (0.11)	0.01 (0.11)		
Low concentration	CC	0.01 (0.11)	0.01 (0.09)	0.01 (0.12)	0.01 (0.11)	0.01 (0.09)	0.01 (0.09)	0.01 (0.10)		
Slow moving/speaking	SM/S	0.01 (0.07)	0.00 (0.06)	0.01 (0.08)	0.01 (0.07)	0.00 (0.06)	0.00 (0.06)	0.01 (0.08)		
Employment status (Employee with permanent & full-time job)	EMP	0.54 (0.50)	0.54 (0.50)	0.50 (0.50)	0.54 (0.50)	0.57 (0.50)	0.57 (0.50)	0.53 (0.50)		
Weight status	WS	0.42 (0.49)	0.53 (0.50)	0.26 (0.44)	0.39 (0.49)	0.39 (0.49)	0.39 (0.49)	0.49 (0.50)		
Males	ML	0.57 (0.49)	-	-	0.55 (0.50)	0.56 (0.50)	0.56 (0.50)	0.64 (0.48)		
Females	FM	0.43 (0.42)	-	-	0.45 (0.50)	0.44 (0.50)	0.44 (0.50)	0.46 (0.48)		
Education level (low)	EDU (L)	0.03 (0.17)	0.03 (0.18)	0.02 (0.14)	0.02 (0.15)	0.03 (0.16)	0.03 (0.16)	0.04 (0.19)		
Education level (medium)	EDU (M)	0.28 (0.45)	0.33 (0.47)	0.23 (0.42)	0.28 (0.45)	0.27 (0.44)	0.27 (0.44)	0.30 (0.46)		
Education level (high)	EDU (H)	0.46 (0.50)	0.45 (0.50)	0.48 (0.50)	0.47 (0.50)	0.47 (0.50)	0.47 (0.50)	0.44 (0.50)		
Source of income (low)	SI (L)	0.28 (0.45)	0.30 (0.46)	0.25 (0.43)	0.20 (0.40)	0.28 (0.45)	0.28 (0.45)	0.43 (0.49)		

Table 2 (cont.)

Regressors	Symbol	All sample	Males	Females	Northern Regions	Centre Regions	Southern Regions
Source of income (medium)	SI (M)	0.20 (0.40)	0.19 (0.39)	0.21 (0.40)	0.19 (0.39)	0.20 (0.40)	0.20 (0.40)
Source of income (high)	SI (H)	0.52 (0.50)	0.51 (0.50)	0.54 (0.50)	0.61 (0.49)	0.52 (0.50)	0.38 (0.48)
Urban area (low)	URB (L)	0.29 (0.46)	0.28 (0.45)	0.31 (0.46)	0.29 (0.45)	0.31 (0.46)	0.29 (0.45)
Urban area (medium)	URB (M)	0.43 (0.50)	0.43 (0.50)	0.43 (0.50)	0.47 (0.50)	0.42 (0.49)	0.38 (0.48)
Urban area (high)	URB (H)	0.27 (0.44)	0.28 (0.45)	0.26 (0.44)	0.24 (0.43)	0.26 (0.44)	0.33 (0.47)
Social network	SN	0.98 (0.15)	0.90 (0.15)	0.98 (0.15)	0.99 (0.12)	0.97 (0.18)	0.97 (0.17)
Legal marital status	LMS	0.57 (0.50)	0.59 (0.49)	0.55 (0.50)	0.54 (0.50)	0.56 (0.50)	0.63 (0.48)
Chronic disease	CD	0.02 (0.15)	0.02 (0.12)	0.03 (0.17)	0.02 (0.15)	0.02 (0.15)	0.02 (0.14)
Chronic anxiety	CA	0.02 (0.13)	0.01 (0.11)	0.02 (0.15)	0.02 (0.13)	0.02 (0.13)	0.02 (0.13)
Type of dwelling (low)	TD (L)	0.04 (0.20)	0.04 (0.20)	0.04 (0.19)	0.03 (0.18)	0.04 (0.20)	0.05 (0.21)
Type of dwelling (medium)	TD (M)	0.79 (0.41)	0.79 (0.41)	0.79 (0.41)	0.78 (0.41)	0.77 (0.42)	0.81 (0.39)
Type of dwelling (high)	TD (H)	0.17 (0.38)	0.17 (0.38)	0.17 (0.38)	0.18 (0.39)	0.19 (0.39)	0.14 (0.35)
Northern regions	NO	0.51 (0.50)	0.49 (0.50)	0.55 (0.50)	-	-	-
Centre regions	CE	0.21 (0.40)	0.20 (0.40)	0.21 (0.40)	-	-	-
Southern regions	ST_IS	0.28 (0.45)	0.31 (0.46)	0.24 (0.43)	-	-	-
Primary sector	PS	0.05 (0.22)	0.06 (0.24)	0.04 (0.20)	0.04 (0.20)	0.04 (0.19)	0.08 (0.27)
Building sector	BS	0.07 (0.26)	0.12 (0.32)	0.01 (0.11)	0.07 (0.25)	0.07 (0.25)	0.09 (0.28)

Table 2 (cont.)

Regressors	Symbol	All sample	Males	Females	Northern Regions	Centre Regions	Southern Regions
Energy & Manufacturing sector	ES	0.15 (0.36)	0.20 (0.40)	0.09 (0.29)	0.19 (0.39)	0.15 (0.36)	0.09 (0.28)
Tertiary sector (private)	TS_PRIV	0.51 (0.50)	0.49 (0.50)	0.54 (0.50)	0.51 (0.50)	0.54 (0.50)	0.50 (0.50)
Tertiary sector (public)	TS_PUB	0.21 (0.41)	0.14 (0.35)	0.31 (0.46)	0.20 (0.40)	0.21 (0.41)	0.25 (0.43)
Management	MANAG	0.13 (0.34)	0.16 (0.37)	0.09 (0.29)	0.13 (0.34)	0.13 (0.34)	0.13 (0.33)
Executive	EXEC	0.37 (0.48)	0.29 (0.45)	0.48 (0.50)	0.38 (0.48)	0.35 (0.48)	0.36 (0.48)
Worker	WOR	0.33 (0.47)	0.36 (0.48)	0.28 (0.45)	0.33 (0.47)	0.35 (0.48)	0.31 (0.46)
Other position	OTH	0.16 (0.37)	0.18 (0.39)	0.14 (0.34)	0.15 (0.36)	0.14 (0.35)	0.20 (0.40)
Observations		10727	6158	4569	5506	2240	2981

Notes: all variables are dichotomous; Northern regions: North-West (NW) + Northern East (NE); Centre regions: Centre (CE); Southern regions: South & Islands (ST_IS); standard deviation in parenthesis;

Source: own elaboration on the Italian “EHIS2” microdata for 2015 wave.

Table 3. Correlation matrix for study variables (EHIS2)

	LI	DEP	SD	TR	ED	SF	LC	SM/S	EMP	WS	ML	EDU (L)	EDU (M)	EDU (H)	SI (L)	SI (M)	SI (H)	URB (H)	URB (M)	URB (L)	SN
LI	1.00																				
DEP	0.45***	1.00																			
SD	0.25***	0.28***	1.00																		
TR	0.33***	0.39***	0.32***	1.00																	
ED	0.25***	0.28***	0.25***	0.30***	1.00																
SF	0.33***	0.46***	0.20***	0.27***	0.29***	1.00															
LC	0.31***	0.23***	0.23***	0.23***	0.18***	0.32***	1.00														
SM/S	0.29***	0.16***	0.16***	0.23***	0.18***	0.32***	0.36***	1.00													
EMP	-0.00	-0.03	-0.00	-0.02	-0.00	-0.01	0.01	0.02*	1.00												
WS	-0.01	0.00	0.00	-0.04***	-0.04***	-0.04***	-0.03***	0.01	0.03**	1.00											
ML	-0.05***	-0.04***	-0.07***	-0.09***	-0.09***	-0.04***	-0.03***	0.01	0.08***	0.27***	1.00										
EDU (L)	0.01	0.03***	0.02*	0.02*	0.01	0.00	-0.01	0.01	-0.05***	0.07***	0.02*	1.00									
EDU (M)	0.01	0.02*	0.00	0.00	-0.00	0.02	0.02	0.00	-0.05***	0.11***	0.12***	-0.14***	1.00								
EDU (H)	0.00	-0.00	0.00	0.00	-0.00	0.00	0.00	0.01	0.03***	0.03***	-0.02*	-0.05***	-0.02*	1.00							
SI (L)	0.04***	0.03**	0.01	0.02*	-0.00	0.02*	0.00	0.00	-0.13***	0.06***	0.05***	0.06***	0.02*	0.06***	1.00						
SI (M)	-0.02*	0.00	-0.01	-0.00	0.01	-0.01	-0.00	0.00	0.12***	-0.01	-0.02*	-0.05***	0.02	0.02	-0.31***	1.00					
SI (H)	-0.02*	-0.03**	-0.01	-0.02	0.01	-0.01	-0.00	0.00	0.06***	-0.03***	-0.03**	-0.03**	0.02	0.02	-0.65***	-0.53***	1.00				
URB (H)	0.01	0.02	0.03***	0.02	0.01	0.01	0.03**	0.01	-0.05***	0.03***	0.03***	0.04***	0.08***	0.00	0.06***	-0.01	-0.05***	1.00			
URB (M)	-0.03**	-0.03**	-0.03**	-0.03**	-0.02*	-0.02*	-0.02*	-0.01	-0.01	-0.00	0.01	-0.02*	-0.02*	0.02*	-0.04***	-0.53***	-0.39***	-0.57***	1.00		
URB (L)	0.02*	0.01	-0.00	0.01	0.01	0.01	-0.00	0.00	0.06***	-0.03***	-0.03***	-0.10***	-0.03**	0.01	-0.01	0.01	0.00	0.01	-0.39***	1.00	
SN	-0.02*	-0.02*	-0.00	-0.01	-0.01	-0.02	-0.01	-0.02	-0.01	-0.02*	-0.01	-0.03**	0.01	0.01	0.04***	0.00	0.04***	0.00	0.01	-0.01	1.00
LMS	-0.03**	-0.02*	0.02	0.02	-0.01	0.01	0.01	0.01	0.03*	0.14***	0.04***	0.04***	0.08***	-0.03**	0.04***	-0.00	-0.04***	0.00	0.02*	-0.03**	-0.04***
CD	0.20***	0.36***	0.23***	0.24***	0.14***	0.27***	0.24***	0.20***	-0.02*	0.00	-0.06***	0.04***	0.03**	-0.01	0.05***	-0.01	-0.03***	-0.00	-0.01	0.02	0.02*
AN	0.18***	0.22***	0.21***	0.23***	0.14***	0.23***	0.23***	0.19***	0.00	0.00	-0.04***	0.00	0.01	-0.00	0.04***	-0.01	-0.03**	0.00	-0.02*	0.03**	0.02*
TD (L)	0.01	0.02*	0.01	0.00	0.02	0.03*	0.02*	0.01	-0.03**	0.03***	0.01	0.06***	0.05***	-0.03**	0.04***	-0.01	-0.02*	0.09***	-0.02	-0.07***	0.02
TD (M)	0.00	-0.02	-0.00	0.00	0.01	-0.00	-0.01	-0.01	0.05***	0.01	-0.00	0.00	0.06***	0.01	0.08***	0.02	-0.09***	-0.07***	-0.03**	0.10***	0.01
TD (H)	-0.01	0.01	-0.00	-0.01	-0.02*	-0.01	-0.00	0.01	-0.03***	-0.03**	-0.00	-0.03**	-0.09***	0.01	-0.10***	-0.02	0.11***	0.03**	0.04***	-0.07***	-0.02
NO	0.00	-0.01	0.03**	0.01	0.01	0.00	0.01	0.00	-0.01	-0.05***	-0.05***	0.00	-0.01	0.01	-0.17***	-0.02	0.17***	-0.07***	0.07***	-0.01	-0.05***
PS	0.01	0.02*	-0.01	0.00	0.00	-0.01	0.01	-0.00	-0.15***	0.04***	0.04***	0.09***	0.11***	0.01	0.05***	-0.02*	-0.07***	0.13***	-0.01	-0.12***	0.00
BS	-0.02*	-0.01	-0.03*	-0.03*	-0.01	-0.01	-0.01	0.01	-0.06***	0.07***	0.20***	0.02	0.10***	-0.05***	0.07***	0.00	-0.07***	0.06***	-0.01	-0.05***	0.02*
ES	0.00	-0.01	-0.01	0.00	-0.02	0.01	0.00	-0.02	0.14***	0.03**	0.15***	0.02	0.09***	0.02*	-0.01	-0.01	0.02*	0.04***	0.06***	-0.11***	-0.02
TS PRIV	-0.01	-0.02*	-0.01	-0.01	0.00	-0.01	-0.01	-0.02	-0.18***	-0.07***	-0.06***	-0.02	-0.03**	0.06***	0.02	0.02*	-0.03**	-0.08***	-0.02*	0.10***	0.02
TS PUB	0.02	0.02*	0.04***	0.03**	0.02	0.02*	0.01	0.03**	0.21***	-0.01	-0.21***	-0.06***	-0.17***	-0.03**	-0.11***	-0.01	0.10***	-0.05***	-0.02*	0.07***	-0.02*
MANAG	-0.01	-0.02	-0.01	-0.02	-0.02	-0.03**	-0.02	-0.02	-0.31***	0.02*	0.10***	-0.03**	-0.12***	-0.06***	-0.08***	-0.05***	0.11***	-0.01	-0.00	0.01	-0.02*
EXEC	0.00	-0.01	0.02	0.01	0.01	-0.00	0.01	0.02	0.38***	-0.08***	-0.19***	-0.11***	-0.32***	0.13**	-0.18***	-0.02	0.18***	-0.10***	-0.01	0.12***	-0.04***
WOR	0.00	0.01	-0.01	0.00	0.00	0.01	0.00	0.00	0.17***	0.04***	0.09***	0.07***	0.31***	-0.06***	0.18***	0.04***	-0.19***	0.08***	0.02*	-0.10***	0.06***

Table 3 (cont.)

	LMS	CD	AN	TD (L)	TD (M)	TD (H)	NO	PS	BS	ES	TS_PRIV	TS_PUB	MANAG	EXEC	WOR	OTH
LMS	1.00															
CD	-0.01	1.00														
AN	-0.01	0.44***	1.00													
TD(L)	-0.02	0.03**	0.01	1.00												
TD(M)	-0.05***	0.00	0.01	-0.39***	1.00											
TD(H)	0.06***	-0.01	-0.02	-0.09***	-0.88***	1.00										
NO	-0.05***	0.01	-0.00	-0.03**	-0.01	0.03**	1.00									
PS	0.02*	0.01	-0.01	0.17***	-0.07***	0.01	-0.05***	1.00								
BS	0.02	-0.02*	-0.02*	0.02*	-0.01	-0.00	-0.03**	-0.07***	1.00							
ES	0.04***	-0.02	-0.01	-0.00	0.01	-0.01	0.10***	-0.10***	-0.12***	1.00						
TS_PRIV	-0.09***	-0.00	-0.02	-0.04***	0.03*	-0.01	0.01	-0.23***	-0.28***	-0.43***	1.00					
TS_PUB	0.05***	0.03*	0.05***	-0.06***	-0.00	0.03*	-0.05***	-0.12***	-0.15***	-0.23***	-0.53***	1.00				
MANAG	0.02*	-0.02*	-0.02	0.00	-0.13***	0.13***	0.00	0.03**	0.08***	-0.08***	0.04***	-0.05***	1.00			
EXEC	0.01	-0.00	0.02	-0.07***	-0.00	0.04***	0.01	-0.14***	-0.16***	-0.13***	-0.06***	0.36***	-0.30***	1.00		
WOR	-0.05***	0.00	0.00	0.02*	0.11***	-0.13***	-0.00	0.03***	0.08***	0.23***	-0.04***	-0.22***	-0.28***	-0.55***	1.00	
OTH	0.04	0.02	-0.01	0.06***	-0.03**	0.00	-0.01	0.12***	0.05***	-0.06***	0.10***	-0.17***	-0.16***	-0.32***	-0.30***	1.00

Notes: see Table 1 and 2 for more details about the statistics and description of the variables; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4. Employment and Mental Health. Regressions considering all individuals

Regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Low Interest	Depression	Sleep disorders	Tiredness	Eating disorders	Sense of failure	Low concentration	Slow moving/speaking	Overall mental health
Employment status (permanent job & full-time)	0.00298***	-0.00612***	0.000305	-0.0101***	0.000920	-0.00322*	0.00139	0.00216***	-0.00698***
Weight status	[0.000518] 0.000776***	[0.00146] 0.00260***	[0.000285] 0.00797***	[0.000190] 0.0136***	[0.000599] 0.0135***	[0.00185] 0.00231***	[0.000935] 0.000682**	[0.000528] 0.000740***	[0.000234] 0.0186***
Males	[0.000208] -0.0118***	[0.000116] -0.00450***	[0.00142] -0.0269***	[0.00166] -0.0367***	[0.000765] -0.0122***	[0.000403] -0.00545***	[0.000267] -0.00515***	[0.000217] -0.00186***	[0.00268] -0.0536***
Education level (medium)	[0.000128] 0.00732***	[0.000804] 0.00611***	[0.000351] 0.00606**	[0.000437] 0.00544***	[0.00104] -0.00593***	[0.000450] 0.00298***	[0.000336] 0.00847***	[0.000298] 0.00147***	[0.000476] 0.00705***
Education level (high)	[0.000637] 0.00575***	[0.000254] 0.00405***	[0.00270] 0.00537***	[0.000837] 0.00435***	[0.000404] -0.00386***	[0.000151] 0.00193***	[0.000934] 0.00578***	[0.0000666] 0.00235***	[0.00203] 0.00301**
Source of income (medium)	[0.000376] -0.0123***	[0.000421] -0.000560	[0.0000936] -0.00628	[0.00113] -0.00445	[0.00114] 0.00144*	[0.000589] -0.00158*	[0.000518] 0.00189*	[0.000287] 0.000907*	[0.00131] -0.00405
Source of income (high)	[0.00266] -0.00883***	[0.00148] -0.00358**	[0.00407] -0.00495	[0.00483] -0.00389	[0.000771] 0.00481***	[0.000883] 0.0000873	[0.0000759] 0.00296***	[0.000540] 0.00176	[0.00790] -0.00660
Urban area (medium)	[0.00255] -0.00467***	[0.00139] -0.00597***	[0.00310] -0.0214***	[0.00286] -0.0125***	[0.000408] -0.00677***	[0.00239] -0.00390***	[0.000839] -0.00608***	[0.00108] -0.00112***	[0.00510] -0.0291***
Urban area (low)	[0.00120] 0.00277	[0.00118] 0.00102	[0.00000411] -0.0192***	[0.00154] -0.00239	[0.000258] -0.00200	[0.00128] 0.000257	[0.00151] -0.00316	[0.000157] -0.00126***	[0.00104] -0.0129***
Social Network	[0.00219] -0.0149***	[0.00124] -0.00659***	[0.00179] 0.00114	[0.00336] -0.00288	[0.00184] 0.000871	[0.00113] -0.00463***	[0.00220] -0.00358	[0.000191] -0.00536	[0.00394] -0.0162***
Legal Marital Status	[0.00406] -0.00952***	[0.00244] -0.00519***	[0.00831] 0.00843***	[0.00379] 0.00870***	[0.00520] -0.00144**	[0.0000150] -0.00061***	[0.00310] 0.00227***	[0.00344] 0.00108***	[0.000833] 0.00862***
Chronic depression	[0.00126] 0.141***	[0.000141] 0.269***	[0.000396] 0.254***	[0.000883] 0.276***	[0.000575] 0.0921***	[0.000125] 0.154***	[0.000115] 0.117***	[0.000346] 0.0732***	[0.000147] 0.392***
Chronic anxiety	[0.000630] 0.121***	[0.00858] 0.0787***	[0.00203] 0.235***	[0.00737] 0.224***	[0.00108] 0.1000***	[0.00497] 0.107***	[0.00218] 0.121***	[0.00375] 0.0707***	[0.00481] 0.300***
	[0.00141]	[0.00848]	[0.00500]	[0.00259]	[0.00576]	[0.00497]	[0.00303]	[0.00224]	[0.0114]

Regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Low Interest	Depression	Sleep disorders	Tiredness	Eating disorders	Sense of failure	Low concentration	Slow moving/speaking	Overall mental health
Type of dwelling (medium)	-0.000548	-0.0102***	-0.00697***	0.00650***	-0.00958***	-0.0113***	-0.00625***	-0.00123	-0.00717***
Type of dwelling (high)	[0.00252] 0.000276	[0.00133]*** -0.00421***	[0.000663]*** -0.00871***	[0.000576]*** 0.00615***	[0.00101]*** -0.0159***	[0.00260]*** -0.0105***	[0.000868]*** -0.00512***	[0.000977] 0.000837	[0.000295]*** -0.0114***
Building	[0.00180] -0.0107*	[0.00116] -0.00682*	[0.000301] 0.00735	[0.000984] -0.00384	[0.00152] -0.00157	[0.00254]*** 0.00820***	[0.00113] -0.00177	[0.00124]*** 0.00636***	[0.000587] -0.00552
Energy & Manufacturing	[0.00555] -0.00287	[0.00359] -0.00486*	[0.00666] 0.0171***	[0.0124] 0.0110	[0.00120]*** -0.00640***	[0.00202]*** 0.0112***	[0.00166] -0.00273*	[0.000318] -0.00115	[0.00428]*** 0.0104***
Tertiary Sector (Private)	[0.00437] -0.00844	[0.00278] -0.00967***	[0.00513] 0.0146***	[0.00754] -0.00238	[0.000801] -0.00241**	[0.00162]*** 0.00691***	[0.00143]*** -0.00395***	[0.000859] 0.000961	[0.00290] -0.00148
Tertiary Sector (Public)	[0.00552] -0.00471	[0.00336] -0.00287	[0.00488] 0.0268***	[0.00754] 0.00210	[0.000971] -0.00249**	[0.00164]*** 0.0110***	[0.00137]*** -0.00418***	[0.00102] 0.00332**	[0.00369] 0.00393
Manager	[0.00354] -0.000456	[0.00388] -0.00325***	[0.00481] 0.00568***	[0.00759] 0.00123	[0.00115] -0.00621***	[0.00278]*** -0.00862***	[0.00103]*** -0.000526***	[0.00163] -0.000298	[0.00342]*** -0.00878***
Executive	[0.000543] -0.00338***	[0.000392] 0.000935	[0.000125] 0.000556	[0.00139] 0.00733***	[0.000705] -0.00410***	[0.000786]*** -0.00314***	[0.000169] 0.00246**	[0.00138] 0.00162**	[0.00315] 0.00173
Worker	[0.0000234] -0.00447***	[0.000714] 0.00127*	[0.000430] -0.00161***	[0.00226] 0.00551***	[0.000318] -0.00098***	[0.000512] 0.000222	[0.00114] 0.0000682	[0.000669] 0.00201***	[0.00419] -0.000875
Constant	[0.000608] 0.0368***	[0.000702] 0.0335***	[0.000375] 0.0528***	[0.00148] 0.0507***	[0.000190] 0.0346***	[0.000934] 0.0152***	[0.00141] 0.00976***	[0.000247] -0.00324	[0.00408] 0.131***
Adj R ²	[0.00696]	[0.00389]	[0.00116]	[0.00734]	[0.00265]	[0.000112]	[0.000853]	[0.00226]	[0.000166]
Macro Regions dummies	0.0565	0.1333	0.0748	0.0803	0.0314	0.0881	0.0765	0.0527	0.0851
Observations.	Yes 10189	Yes 10188	Yes 10188	Yes 10184	Yes 10183	Yes 10187	Yes 10196	Yes 10192	Yes 10227

Notes: Macro regions dummies: North-East, North-West, Centre, South & Islands; South & Islands as benchmark group; Standard errors in brackets; In all specifications, South & Islands dummy is used as categorical variable to be absorbed; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5. Employment and Mental Health: Gender and economic dualism between the Italian regions

Dep. Variable: Overall mental health	(1)	(2)	(3)	(4)	(5)
Regressors	Females	Males	Northern regions	Central regions	Southern regions
Employment status (permanent job & full-time)	-0.0142*** [0.00231] 0.0239***	-0.00238 [0.00318] 0.0148***	0.00412 [0.00933] 0.0137***	-0.0401*** [0.00836] 0.0118**	-0.00436 [0.00679] 0.0339***
Weight status	[0.00486] 0.0288***	[0.00192] -0.00689**	[0.000687] 0.0119***	[0.00569] 0.00857	[0.0103] -0.00174
Education level (medium)	[0.000113] 0.0118***	[0.00270] -0.00365***	[0.00135] -0.00443	[0.0399] 0.00873	[0.0198] 0.0125
Education level (high)	[0.00174] -0.0151	[0.000933] 0.00603*	[0.00441] -0.0147	[0.0303] -0.0295	[0.00795] 0.0304**
Source of income (medium)	[0.0124] -0.0184*	[0.00315] 0.00445***	[0.0133] -0.00414	[0.0191] -0.0452**	[0.0151] 0.0143
Source of income (high)	[0.00938] -0.0276***	[0.00102] -0.0305***	[0.0136] -0.0246***	[0.0189] -0.0284	[0.0110] -0.0333***
Urban area (medium)	[0.00364] -0.00746	[0.000992] -0.0181***	[0.00220] -0.00312**	[0.0201] -0.00510	[0.0114] -0.0332**
Urban area (low)	[0.00709] -0.0408***	[0.000641] 0.000487	[0.00154] 0.0203***	[0.0249] -0.0508	[0.0150] -0.0149
Social Network	[0.0108] 0.000579	[0.0138] 0.0166***	[0.00467] 0.00698*	[0.0838] 0.0110	[0.0286] 0.0111***
Leagl marital Status	[0.000628] 0.381***	[0.000912] 0.408***	[0.00417] 0.341***	[0.0146] 0.540***	[0.00305] 0.369***
Chronic depression	[0.00790] 0.290***	[0.00169] 0.310***	[0.00715] 0.372***	[0.00355] 0.240***	[0.0208] 0.225***
Chronic anxiety	[0.00513] -0.00587	[0.0185] -0.00848**	[0.00873] -0.00296	[0.0274] -0.0103	[0.0185] -0.0102
Type of dwelling (medium)	[0.00601] -0.0187***	[0.00422] -0.00655***	[0.00907] -0.00641	[0.0217] -0.0133	[0.0122] -0.0203**
Type of dwelling (high)	[0.00512] 0.0447***	[0.00198] -0.0205***	[0.00411] 0.0182	[0.00837] -0.0376***	[0.00977] -0.0248
Building	[0.00184] 0.0520***	[0.00682] -0.0108***	[0.0293] 0.0210	[0.00773] 0.00130	[0.0391] -0.00488
Energy & Manufacturing	[0.00632] 0.0250***	[0.00264] -0.0161**	[0.0268] 0.00970	[0.0272] -0.00641	[0.0256] -0.0208
Tertiary Sector (Private)	[0.000465] 0.0408***	[0.00802] -0.0197**	[0.0144] 0.0113	[0.00528] 0.0111**	[0.0261] -0.0129
Tertiary Sector (Public)	[0.000356] [0.000356]	[0.00776] [0.00776]	[0.0233] [0.0233]	[0.00499] [0.00499]	[0.0316] [0.0316]

Table 5 (cont.)

Dep. Variable: Overall mental health					
Regressors	(1)	(2)	(3)	(4)	(5)
	Females	Males	Northern regions	Central regions	Southern regions
Manager	0.0160*** [0.00274]	-0.0214*** [0.00178]	-0.00137 [0.0107]	-0.00889 [0.0271]	-0.0285*** [0.0117]
Executive	0.00392 [0.00666]	0.000742 [0.000898]	-0.00679 [0.0102]	0.0532*** [0.00788]	-0.0217 [0.0176]
Worker	-0.00759 [0.00613]	0.00143** [0.000654]	-0.00130 [0.0147]	0.0297 [0.0287]	-0.0219 [0.0158]
Constant	0.108*** [0.00112]	0.0888*** [0.00195]	0.0996*** [0.00668]	0.121*** [0.0172]	0.102*** [0.00564]
Adj. R ²	0.0797	0.0716	0.0766	0.1171	0.0780
Macro Regions dummies	Yes	Yes	No	No	No
Observations	4373	5854	5304	2178	2745

Notes: Macro regions dummies: North-East, North-West, Centre, South & Islands as benchmark group; In all specifications, gender dummy is used as categorical variable to be absorbed; Standard errors in brackets; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6. Employment and Mental Health. The interaction between occupation in employment and economic sector of employment

Dep. Variable: Overall mental health	(1)	(2)	(3)	(4)	(5)	(6)
Regressors	All individuals	Females	Males	Northern regions	Central regions	Southern regions
Employment status (employee with permanent & full- time job)	-0.00666***	-0.0139***	-0.00164	0.00361	-0.0398***	-0.00262
Weight status	[0.000490] 0.0185***	[0.00290] 0.0236***	[0.00316] 0.0152***	[0.00918] 0.0139***	[0.00528] 0.0113***	[0.00712] 0.0336***
Education level (medium)	[0.00247] 0.00611**	[0.00519] 0.0264**	[0.00199] -0.00737***	[0.000716] 0.0112***	[0.00367] 0.00634	[0.00404] -0.000932
Education level (high)	[0.00187] 0.00253*	[0.0000213] 0.00977***	[0.00231] -0.00346***	[0.000231] -0.00507	[0.0243] 0.00861	[0.00536] 0.0138
Source of income (medium)	[0.00131] -0.00407	[0.00180] -0.0151	[0.00126] 0.00608*	[0.00597] -0.0151	[0.0207] -0.0311**	[0.00229] 0.0328***
Source of income (high)	[0.00757] -0.00667	[0.0132] -0.0186*	[0.00327] 0.00457***	[0.0128] -0.00375	[0.0139] -0.0455***	[0.00523] 0.0168***
Urban area (medium)	[0.00483] -0.0293***	[0.00999] -0.0274***	[0.000921] -0.0311***	[0.0133] -0.0253***	[0.0124] -0.0267**	[0.00331] -0.0346***
Urban area (low)	[0.000904] -0.0131***	[0.00379] -0.00711	[0.000992] -0.0188***	[0.00233] -0.00385**	[0.0107] -0.00456	[0.00464] -0.0338***
Social Network	[0.00367] -0.0166***	[0.00749] -0.0403***	[0.000436] 0.000316	[0.00177] 0.0217***	[0.0142] -0.0546	[0.00716] -0.0166
Legal marital Status	[0.00106] 0.00873***	[0.0111] 0.000118	[0.0142] 0.0172***	[0.00432] 0.00652	[0.0428] 0.0108	[0.0139] 0.0114***
Chronic depression	[0.000173] 0.392***	[0.000573] 0.381***	[0.000711] 0.407***	[0.00506] 0.341***	[0.00999] 0.541***	[0.00249] 0.367***
Chronic anxiety	[0.00463] 0.299***	[0.00908] 0.287***	[0.00154] 0.309***	[0.00547] 0.370***	[0.00142] 0.234***	[0.0141] 0.225***
Type of dwelling (medium)	[0.0107] -0.00707***	[0.00540] -0.00466	[0.0181] -0.00903*	[0.0120] -0.00128	[0.0197] -0.0120	[0.0156] -0.00849**
Type of dwelling (high)	[0.00114] -0.0109***	[0.00592] -0.0178***	[0.00478] -0.00591**	[0.0117] -0.00466	[0.00875] -0.0123***	[0.00417] -0.0176***
Building	[0.000317] 0.0102	[0.00477] 0.0513***	[0.00241] 0.00287	[0.00572] 0.0451***	[0.000593] 0.0577***	[0.00267] -0.0619***
Energy & Manufacturing	[0.0166] -0.00599	[0.0164] 0.0941***	[0.0216] -0.0283***	[0.0146] -0.0217***	[0.00417] 0.0690**	[0.00492] 0.00451
Tertiary Sector (Private)	[0.00519] -0.00992	[0.00663] 0.0122***	[0.00679] -0.0182	[0.00563] 0.00465	[0.0301] 0.0816***	[0.00588] -0.0802***
	[0.0155]	[0.00177]	[0.0258]	[0.0113]	[0.00155]	[0.0135]

Table 6 (cont.)

Dep. Variable: Overall mental health						
Regressors	(1) All individuals	(2) Females	(3) Males	(4) Northern regions	(5) Central regions	(6) Southern regions
Tertiary Sector (Public)	-0.0268 [*] [0.0147]	0.0153 ^{***} [0.00202]	-0.0676 ^{***} [0.0231]	-0.0198 ^{***} [0.00251]	0.0843 ^{**} [0.0344]	-0.0905 ^{***} [0.0248]
Manager	-0.00532 [0.0179]	0.0207 ^{***} [0.00231]	-0.0144 [0.0281]	-0.00106 [0.0320]	0.158 ^{***} [0.00769]	-0.0879 ^{***} [0.0134]
Executive	-0.0672 ^{***} [0.0198]	-0.0329 ^{**} [0.0136]	-0.0929 ^{***} [0.0185]	-0.0962 ^{***} [0.0127]	0.110 ^{**} [0.0493]	-0.164 ^{***} [0.00608]
Worker	-0.00598 [0.0212]	-0.0215 [0.0133]	0.00927 [0.0201]	0.00572 [0.0195]	0.137 ^{***} [0.00105]	-0.0756 ^{***} [0.00968]
Building * Manager	-0.0218 [0.0193]	-0.0960 ^{***} [0.00264]	-0.0154 [0.0291]	-0.0186 [*] [0.0106]	-0.214 ^{***} [0.0147]	0.0566 ^{***} [0.0154]
Energy & Manufacturing * Manager	0.00436 [*] [0.00226]	0.000537 [0.00225]	0.00414 [0.0125]	0.0526 [0.0841]	-0.166 ^{***} [0.00646]	-0.0710 ^{***} [0.0224]
Tertiary Sector (Private) * Manager	-0.00659 [0.0182]	0.000106 [0.00342]	-0.0159 [0.0323]	-0.0140 [0.0495]	-0.171 ^{***} [0.0228]	0.0790 ^{***} [0.0107]
Tertiary Sector (Public) * Manager	0.0233 [0.0166]	-0.00306 [0.00899]	0.0485 [0.0321]	0.0353 [0.0348]	-0.167 ^{***} [0.00702]	0.0929 ^{***} [0.0344]
Building * Executive	0.0470 ^{***} [0.0161]	0.0490 ^{**} [0.0223]	0.0279 [0.0173]	0.0439 [0.0370]	0.000677 [0.0298]	0.116 ^{***} [0.0213]
Energy & Manufacturing * Executive	0.0711 ^{***} [0.00925]	-0.0238 ^{***} [0.00631]	0.0977 ^{***} [0.0120]	0.129 ^{***} [0.0280]	-0.107 [0.0690]	0.101 ^{***} [0.0183]
Tertiary Sector (Private) * Executive	0.0745 ^{***} [0.0177]	0.0439 ^{***} [0.00496]	0.0984 ^{***} [0.0246]	0.0958 ^{***} [0.0243]	-0.0664 [*] [0.0389]	0.159 ^{***} [0.00992]
Tertiary Sector (Public) * Executive	0.0891 ^{***} [0.0178]	0.0468 ^{***} [0.00715]	0.142 ^{***} [0.0203]	0.104 ^{***} [0.0217]	-0.0409 [0.0771]	0.173 ^{***} [0.0161]
Building * Worker	-0.0318 [0.0226]	-0.140 ^{***} [0.0304]	-0.0478 ^{**} [0.0235]	-0.0679 [0.0466]	-0.128 ^{***} [0.00122]	0.0438 ^{***} [0.00604]
Energy & Manufacturing * Worker	0.0181 ^{**} [0.00899]	-0.0445 ^{***} [0.00250]	0.0139 [0.00923]	0.0302 [0.0226]	-0.0744 ^{***} [0.0249]	-0.0132 [*] [0.00789]
Tertiary Sector (Private) * Worker	0.00264 [0.0206]	0.00985 [0.00736]	-0.00804 [0.0257]	-0.0144 [0.0332]	-0.122 ^{***} [0.0130]	0.0722 ^{***} [0.00402]
Tertiary Sector (Public) * Worker	0.0465 ^{**} [0.0184]	0.0607 ^{***} [0.00673]	0.0264 [0.0239]	0.0597 [0.0601]	-0.137 ^{***} [0.0524]	0.105 ^{***} [0.000469]
Constant	0.139 ^{***} [0.00906]	0.119 ^{***} [0.00298]	0.0909 ^{***} [0.0140]	0.106 ^{***} [0.0273]	0.0432 ^{***} [0.0120]	0.143 ^{***} [0.00412]

Table 6 (cont.)

Dep. Variable: Overall mental health	(1)	(2)	(3)	(4)	(5)	(6)
Regressors	All individuals	Females	Males	Northern regions	Central regions	Southern regions
Adj. R ²	0.0847	0.0783	0.0716	0.0765	0.1164	0.0770
Macro Regions dummies	Yes	Yes	Yes	No	No	No
Observations	10227	4373	5854	5304	2178	2745

Notes: Macro regions dummies: North-East, North-West, Centre, South & Islands; South & Islands as benchmark group; In all specifications, gender dummy is used as categorical variable to be absorbed; Standard errors in brackets; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$