Gender Differences in the Relationship between Job Instability and Depression: A Preliminary Study

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Abstract
Stress factors in the workplace can affect workers mental health, increasing the risk of developing psychological disorders. Different factors affect the relationship between the perception of safety in the workplace and mental health: security of workplace, quality of relationships and internal communication, gender and type of role. Longitudinal studies showed that a higher level of job insecurity, flexibility and low social support can negatively affect mental health, with high correlations to depressive and anxiety disorders. Furthermore, differences in the reaction to job stress related to the gender have been reported in literature. In this preliminary study we investigated the relationship between type of contractual form, gender, subjective perception of safety in work place, salary and personal relationship considering a sample of 30 subjects (16 with permanent job, 14 with temporary job). We evaluated the subjective perception of stress (PSS), the level of anxiety and depression (BDI and STAY). Quality of relationships with colleagues, hygiene in workplace, level of education and adherence to studies were also considered. The results of GLM analysis shown significant correlations between the type of contractual form, gender and the level of depression (BDI). Furthermore, we found a non significant trend between job stability and gender, and STAI and salary.

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Introduction

High level of stress in the workplace can has a strong effect on the workers health and mental health, producing an array of consequences including the increased risk of coronary diseases developing (Marmot & Brunner 2005; Karmaus 1984; Hemingway et al. 2003), mental ill and psychological symptoms such as depression, insomnia, headache, anxiety, weight change and panick attack (Cooper et al. 1989; Danna and Griffin, 1999). Godin et al (2005) found that positive rewards, such as promotions, in relation to high work efforts, could have positive effects on the worker's mental health. Indeed, low level of job satisfaction (i.e. low level of responsibility, lack of freedom in the working methods choosing and lack of job variety) results to be associated to workers high stress level, which is significantly predictive of high level of mental ill and low level of wellbeing (Cooper et al. 1989; Adelmann, 1987).

Currently, a descriptive framework of the main stress factors and their consequence on mental health (Danna and Griffin, 1999) is available. The main described stress factors are: workload, safeness in the workplace, leadership quality, internal communication efficiency, sudden change in job or job environment, social support (Karasek & Theorell, 1990) and lack control over work (Marmot et al., 1997).

Some authors highlighted that job insecurity has a important role in the worker's mental health, causing high anxiety level, depression and stomach and sleep disorders (Sverke et al., 2002; Burgard et al., 2012; Schumacher et al., 2015; Latza et al., 2015). Furthermore, Carlson (2015) found an effect of job insecurity distress on birth outcomes.

Recent studies suggest that variables concerning personal life and personality characteristics could provide important information to better understand the role of work-stress in the mental health (Bonde et al., 2008; Marchand et al., 2015). In particular, Marchand et al. (2015) included in the study an array of familiar factors, such as marital status, marital strain, parental strains, family-work conflicts and work-family conflicts.

In several works, the relationship between job stress and gender has been studied, but the results are not always consistent (Cordes and Dougherty, 1993). Some studies show gender differences in the relationship between job satisfaction and psychological distress (Clearly and Mechanic, 1983), in the burnout incidence (Pretty et al., 1992), in the relationship between self-efficacy and job satisfaction (Klassen & Chiu 2010) and in perception of job control and job strain (de Smet et al. 2005). On the other hand, gender effect could became not significant reducing the sampling bias (considering variables such as job role, salary or education) (Gore and Mangione, 1983; Barnett et al., 1993; 2001). More generally, several authors proposed to consider the effects of social, cultural and economical changes on the gender differences in work studies (Barnett et al., 2001, Greenhouse and Powell, 2006; Mitchell et al., 2015)

In this study, we evaluated the role of gender in the relationship between job insecurity (permanent vs not permanent job contract) and mental health, considering

the sentimental status, the salary subjective satisfaction and the perception of safeness at work in a sample of 30 subjects from Milan (Italy). We measured the level of depression, anxiety, perceived stress and personality style to assess the mental health status.

Material and methods

We sought to study if gender differences have a role in the relationship between the job instability and mental health, in Italian workers. Mental health of the participant were evaluated on the basis of a battery of psychological tests, while their life situation were evaluated on the basis of personal data.

Dependent Variables

To assess the mental health status of participant we chose to measure the level of depression, anxiety, the perception of personal well-being, stress and the personality style using tests validated on the Italian sample. Beck Depression Inventory-II (BDI-II) (Beck et al., 1996), State-Trait Anxiety Inventory - Forma Y (STAI-Y) (Spielberger et al., 1970), Big Five Inventory (BFI) (John & Srivastava, 1999), The Psychological General Well-Being Index (PGWBI) (Dupuy, 1984) and Perceived Stress Scale (PSS) (Cohen et al., 1983) were used to this purpose. The Psychological General Well-being Index measures 5 different scale: depression (3 items), anxiety (5 items), positivity and wellbeing (4 items), self-control (3 items), general health (3 items), vitality (4 items). The Big Five Questionnaire measures 5 scale: Agreeableness (9 items), Neuroticism (8 items), Openness (10 items), Extroversion (8 items), Conscientiousness (9 items).

Personal data considered in the study were sex, age, nationality, past or current mental disease, pharmacological treatment, perception of adequacy of salary, involving in a romantic relationship, job contract form and perception of safeness on the workplace. The variables "adequacy of salary on the job performed" and "safeness on the workplace" were evaluated with a numerical scale, ranging from 1 to 10 (1: very bad, 10: excellent).

Subjects recruitment

The subjects included in the study (n=30) were recruited from the Milan hinterland area (Italy) by using social media. We selected 30 subjects of which, 16 with permanent job contract and 14 with not permanent job contract (mean age: 34, +- 8, range 26-42; sex: 15 females and 15 males).
We up-loaded all tests on the on-line platform "Google Documents", so that each subject could perform the questionnaires at home. When the participants completed the tests, they was not able to access to the tests. All participant were asked to perform the tests at home, without having distracting elements or discomfort.
All the involved subjects signed the voluntary Informed Consent to participate in the study, with information about the object of the study and the modality used. Privacy of data has been guaranteed by completely anonymous procedures of data analysis.

Data analysis

The collected data were organized in a database, and variables with very low level of variability were selected to be removed.

Outliers were detected on the basis of the Mahalanobis distance, calculated with "psych" R library (Roe et al., 2015), and removed from the database.

To study the role on the relationship between job insecurity and mental health, we used General Linear Model (GLM) to test the relationship between personal data variables and the result of each psychological test included in the study. We tested the following models:

model 1 (no Sex-Contract interaction):
$Test = \beta_0 + \beta_1\ Contract + \beta_2\ Sex + \beta3\ Per.Rel + \beta_4\ Salary + \beta_5\ Safeness + \varepsilon$

model 2 (Sex-Contract interaction):
$Test = \beta_0 + \beta_1\ Contract + \beta_2\ Sex + \beta_3\ Per.Rel + \beta_4\ Salary + \beta_5\ Safeness + \beta_6\ Contract * Sex + \varepsilon$

The dependent variable (Test) represents the psychological test result, "Contract" represents the job contract form (permanent, not permanent), "Sex" represents sex (male, female), "Per.Rel" represents the romantic relationship (involving in romantic relationship, not involving in romantic relationship), "Salary" represents the perception of adequacy of salary and "Safeness" the sense of safeness on the workplace. In the first model, the linear relationship between the independent variables (Contract, Sex, Per.Rel, Salary and Safeness) and the Test variable was tested, while in the second model, the interaction between the sex and the job contract form was added to the model. The two models were used to fit personal data to all the scales of the psychological tests included in the study, one by one.

For each analysis, t-test was used to check if the mean of the residuals is statistically significantly different from zero, while we used the Shapiro-Wilk test to check if residuals were normally distributed.

The Akaike Information Criterion (AIC) was used to compare the model 1 and the model 2: the models were considered to be significant different if AIC difference was equal or more than 2 (Sakamoto et al. 1986) .

Results

The aim of this study was to evaluate the role of the sex on the relationship between job insecurity and mental health. We included in the study 30 subjects, 25-45 years-old from the Milan hinterland area (Italy). Subjects were interviewed using a battery of psychological tests, including BDI-II (Beck et al., 1996), STAI-Y (Spielberger, 1983), BFI (John et al., 1999), PGWBI (Dupuy, 1984) and the PSS (Cohen et al., 1983). Sex, perception of adequacy of salary, involving in a romantic relationship, job contract form, perception of safeness on the workplace, age, nationality, past or current mental disease, and pharmacological treatment personal data were also collected from the subjects.

Four outliers were identified and removed from the database (see material and methods). From the remaining dataset, the nationality (25 Italian, 1 Peruvian), past or current mental disease (26 with no mental disease declaration) and pharmacological treatment (26 with no pharmacological treatment declaration) variables were removed from the database because of their stability in the sample.

The relationship between the personal data variables and the 14 psychological scales values (obtained from the five psychological tests included in the study) were tested with two generalized linear models (see Material and Methods). Both the models contain the same dataset of independent variables (the personal data variables sex, perception of adequacy of salary, involving in a romantic relationship, job contract form, perception of safeness on the workplace) with the main difference that, in contrast to the first model, the second model includes the interaction between the variables Sex and Contract. For each scale of the psychological tests included in the study, both the models were tested and difference in the model AIC were considered.

The results of GLM analyses (Table 1) performed using the first model (Test = β_0 + β_1 Contract + β_2 Sex + $\beta3$ Per.Rel + β_4 Salary + β_5 Safeness + ε) show a negative no significant trend between STAI 1 and Sex ($\beta2$= -8,12, p-value < 0.1), a negative no significant trend between Depression scale of PGWBI and Salary ($\beta4$= -0,58, p-value < 0.1), a negative no significant trend between Agreeableness scale of BF and Contract ($\beta1$= -4,68, p-value < 0.1), a significant relation between Agreeableness scale of BF and Sex ($\beta2$= 5,32, p-value < 0.05) and from Agreeableness scale of BF and Salary ($\beta4$= 1,22, p-value < 0.05) and a negative no significant trend from Neuroticism scale of PGWBI and Sex ($\beta2$= -7,57, p-value < 0.1).

The results of GLM analyses (Table 1) performed using the second model (Test = β_0 + β_1 Contract + β_2 Sex + $\beta3$ Per.Rel + β_4 Salary + β_5 Safeness + β_6 Contract * Sex + ε) show a significant relation between BDI and Contract (β_{1}= 20,56, p-value < 0.01), BDI and Sex (β_{2}= 24,23, p-value < 0.01), a negative no significant trend between BDI and Personal Relationship ($\beta3$ = -3,39, p-value < 0.1), a negative no significant trend between BDI and Safeness (β_{5}= -0,68, p-value < 0.1), a significant relation between BDI and the interaction between Contract and Sex (β_{6}= -16,27, p-value < 0.0001).

Furthermore, in the analyses performed using BDI as dependent variable, the AIC value calculated for the model 2 (AIC= 14,48), which include the interaction between

Sex and Contract variables, is significantly less then the correspondent value calculated for the model 1 (AIC= 151, 54). This indicates that model 2 fits the data better than model 1 (Sakamoto et al., 1986).

The mean BDI values obtained from the male-permanent, male-not-permanent, female-permanent and female-not-permanent categories are shown in Figure 1. The BDI mean value is very similar between males and females with not-permanent job contract, while it is significantly different (Wilcox test, p-value < 0.05) between male and female with permanent job contract.

Table1

Test	Intercept (β_0)	Contract (β_1)	Sex(β_2)	Per.Rel(β_3)	Salary (β_4)	Safeness (β_5)	AIC1	Intercept (β_0)	Contract (β_1)	Sex(β_2)	Per.Rel(β_3)	Salary (β_4)	Safeness (β_5)	Contract:Sex (β_6)	AIC2	|AIC1-AIC2|
BDI	24,53**	-1,32	-2,72	-3,75	0,26	-0,80	151,54	-11,53	20,56**	24,23**	-3,39	0,25	-0,68	-16,27***	136,70	14,84
STAI1	60,03***	4,40	-8,12.	-2,07	-1,35	-0,45	174,24	43,10.	14,67	4,54	-1,90	-1,35	-0,40	-7,64	175,24	1,00
STAI2	42,44**	-0,35	-4,67	-2,98	-0,29	0,50	184,36	23,92	10,88	9,17	-2,80	-0,30	0,55	-8,35	185,59	1,23
PGWBI ANXIETY	11,62.	-0,81	3,205	1,52	-0,18	0,04	143,18	15,06	-2,90	0,63	1,49	-0,18	0,03	1,55	145,02	1,84
PGWBI DEPRESSION	13,64***	-0,99	1,18	0,52	-0,58	0,06	115,65	20,12**	-4,92	-3,66	0,46	-0,58	0,04	2,92	115,74	0,09
PGWBI WELLNESS	11,98*	-1,51	-0,33	0,57	-0,48	0,49	128,66	22,46**	-7,88	-8,16	0,47	-0,48	0,46	4,73	127,75	0,91
PGWBI AUTOCONTROL	10,41*	-1,31	0,47	0,46	-0,11	0,05	120,97	18,84*	-6,42	-5,83	0,38	-0,11	0,02	3,80	120,36	0,61
PGWBI VITALITY	14,42*	1,21	-0,16	-0,52	-0,46	-0,07	137,09	14,47	1,18	-0,20	-0,52	-0,46	-0,07	0,02	139,09	2,00
PGWBI PSS	22,46*	0,02	-4,45	2,01	-0,57	0,06	154,80	17,65	2,93	-0,86	2,06	-0,57	0,07	-2,17	156,62	1,82
BF EXTR	28,64**	-2,36	0,67	1,34	0,43	-0,25	163,45	31,58	-4,15	-1,53	1,31	0,43	-0,26	1,33	165,40	1,95
BF CONSC	33,19***	-1,37	-0,65	0,60	0,15	-0,01	153,43	46,50**	-9,44	-10,60	0,47	0,15	-0,06	6,00	153,89	0,46
BF OPEN	51,56**	0,56	-0,54	-1,87	-1,14	-0,37	179,59	35,93	10,04	11,14	-1,72	-1,15	-0,32	-7,05	180,92	1,33
BF AGREE	30,05***	-4,68	5,32*	-0,60	1,22*	-0,37	144,01	26,90*	-2,76	7,68	-0,57	1,21*	-0,36	-1,42	145,88	1,87
BF NEURO	35,07**	4,34	-7,57	-3,66	0,54	-0,85	169,50	23,86	11,15	0,82	-3,54	0,54	-0,81	-5,06	170,96	1,46

Table 1. GLM results: All the coefficients calculated in the GLM analyses are reported. The AIC value of each analysis and the absolute value of the AIC difference between the two model are reported. Statistically significance is reported as follow:
. P < 0.1; * P < 0.05; ** P < 0.01; *** P < 0.001.

Table2

Test	Contract				Sex			
	Permanent		Not Permanent		Male		Female	
	mean	sd	mean	sd	mean	sd	mean	sd
STAI 1	41.37	9.44	42.76	7.51	41.37	9.44	42.76	7.51
STAI 2	25.68	14.92	30.82	11.53	25.68	14.92	30.82	11.53
BDI	10.00	7.04	9.88	5.50	10.00	7.04	9.88	5.50
PGWBI Axiety	15.84	5.05	14.71	4.06	15.84	5.05	14.71	4.06
PGWBI Depression	11.89	2.02	11.35	2.78	11.89	2.02	11.35	2.78
PGWBI Wellness	10.21	3.15	10.53	3.50	10.21	3.15	10.53	3.50
PGWBI Self-control	9.63	2.50	9.76	2.46	9.63	2.50	9.76	2.46
PGWBI General health	10.32	2.47	10.59	3.26	10.32	2.47	10.59	3.26
PGWBI Vitality	13.11	5.11	12.47	4.00	13.11	5.11	12.47	4.00
PSS	17.37	6.76	19.24	5.73	17.37	6.76	19.24	5.73
BF Extroversion	27.89	5.82	29.59	6.53	27.89	5.82	29.59	6.53
BF Agreeableness	32.95	5.19	34.71	4.82	32.95	5.19	34.71	4.82
BF Consciousness	28.58	6.74	32.47	7.12	28.58	6.74	32.47	7.12
BF Neuroticism	24.89	10.42	24.71	6.91	24.89	10.42	24.71	6.91
BF Openness	37.89	10.88	40.65	6.85	37.89	10.88	40.65	6.85

Table 2. Psychological test mean and standard deviation values:
Comparison of mean and standard deviation (sd) values in subjects, organized on the basis of their contract form and the gender.
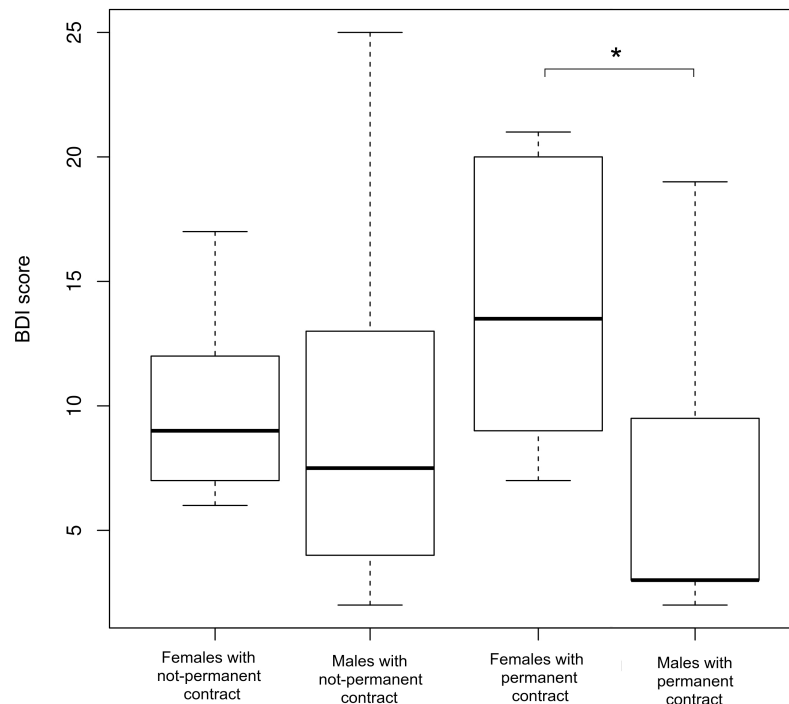
Figure 1. Mean BDI score in gender-contract subjects categories. The significantly (P-value < 0.05) different pair of means are indicated with *.

Discussion

During the 2003, not-permanent job contract forms were introduced in the Italian Labour Code. At the moment the relationship between the wellbeing and mental health status and the condition of instability at work, is not completely understood. Currently, the gender role in the relationship between job instability (due to not-permanent job contract) and mental health is an open topic.

In this work we present the result of a preliminary study involving 30 workers, recruited in the Milan hinterland area (Italy) during Spring 2015. We collected a set of personal data (sex, perception of adequacy of salary, involving in a romantic relationship, job contract form, perception of safeness on the workplace, age, nationality, past or current mental disease and pharmacological treatment) from the subjects and evaluated their mental health on the basis on a battery of psychological tests (BDI-II, STAI-Y, BFI, PGWBI, PSS). We tested the influence of the gender in the relationship between job instability and mental health using two general linear models.

In our sample, we found that sex has a major role in the relationship between the job instability and the depression level. Indeed, females with permanent job contracts results to be affected to a significantly higher depression level, in comparison to the

males with the same contract form. The results (Table 1) show that the subjects involved in a romantic relationship have lower depression level (measured with BDI test), consistently with data in literature (Karasek and Theorell, 1990; Greenhouse et al., 2006; Mitchell et al., 2015). Furthermore, the level of perceived safeness on workplace could be negatively related to the measured depression level, suggesting the importance of this factor in the worker's mental health status. Moreover, depression level measured with PGWBI depression scale results negatively related to salary.

The data concerning the relation between depression level, gender and job stability could be read in two ways: a) females are strong responsive to job stress, increasing their level of depression and anxiety (Clearly and Mechanic, 1983; Pretty et al., 1992; Klassen and Chiu, 2010); b) the relationship between gender and the levels of depression and stress could be due to a sampling bias, produced by the lack of social and job variables in the framework (Gore and Mangione, 1983; Lernkau et al., 1987; Barnett et al., 1993).

Following the fist way of interpretation, we should expect to find significant relations between gender and the levels of stress, anxiety or depression. On the second interpretation we should expect to find relations between one or more psychological test variables and the salary, the safeness or the romantic relationship variables, without gender effect. Indeed, we found a not significant trend between there three variables and depression level measures.

In conclusion, the results of this study suggest that male and female show different levels of depression in relation to the job, but social and economical conditions (salary satisfaction, security at work, sentimental relationship) have a role in determining this effect. In this preliminary study we did not consider how salary, security at work and sentimental status differ between male and female. More detailed information concerning these variables and a wider sample are required to better understand this phenomenon.

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