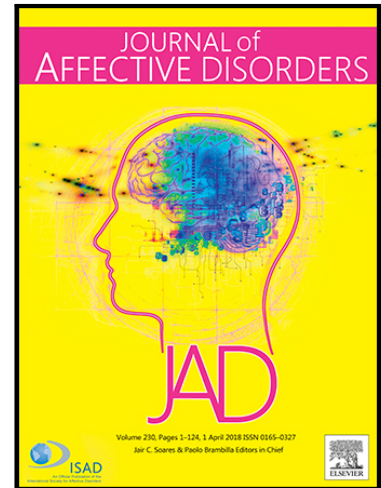# Journal Pre-proof

Mental health among university students: the associations of effort-reward imbalance and overcommitment with psychological distress

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Mental health among university students: the associations of effort-reward imbalance and overcommitment with psychological distress

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Highlights

- Psychological distress is highly prevalent among university students

- Female students are at higher risk for psychological distress

- Effort-Reward imbalance and overcommitment are associated to psychological distress

- Effort-reward imbalance and overcommitment partially explain the gender gap

Abstract

Background. Mental health problems are highly prevalent among university students, but little is known about their underlying determinants. This study explores mental health among university students, the association between "effort-reward imbalance" (ERI), overcommitment and mental health, and to what extent ERI and overcommitment explain gender differences in mental health.

Methods. Cross-sectional data were analysed from 4760 Italian university students. The Kessler Psychological Distress Scale-10 was used to measure self-reported psychological distress, as an indicator of mental health, and the ERI – Student Questionnaire to measure effort, reward and overcommitment. The associations between ERI and overcommitment with psychological distress were estimated with multinomial logistic regression analyses.

Results. 78.5% of the respondents experienced psychological distress, with 21.3%, 21.1%, and 36.1% reporting respectively mild, moderate and severe psychological distress. Female students were more likely to report moderate and severe psychological distress. ERI and overcommitment were strongly associated with severe psychological distress with ORs respectively up to 19.9 (95% CI: 12.2-32.5) and 22.2 (95% CI: 16.1-30.7). ERI and overcommitment explained part of the higher odds of severe psychological distress among female students comparing to males, attenuating the ORs from 2.3 (95% CI: 1.9-2.7) to 1.4 (95% CI: 1.2-1.7).

Limitations. This cross-sectional study was performed on a large, but convenient sample.

Discussion. More than one out of three students reported severe psychological distress. Decreasing ERI and overcommitment may be beneficial in the prevention of psychological distress among university students and may reduce gender differences in psychological distress. Longitudinal studies are needed to further investigate these associations.

Keywords

Psychological distress; stress; effort-reward imbalance; overcommitment, ERI; mental health; university student

BACKGROUND

The prevalence of mental health problems among university students exponentially rose during the past decade (Benton et al., 2003; Duffy et al., 2019). Recent meta-analyses estimated a prevalence of 33.8% for anxiety and 27.2% for depressive symptoms among university students worldwide (Quek et al., 2019; Rotenstein et al., 2016). Psychological distress was identified as the most prevalent mental health problem for university students (Benton et al., 2003; Gibbons et al., 2019). The prevalence of mental health problems was found to be higher among female students than among the male ones (Benton et al., 2003; Duffy et al., 2019). Many studies estimated the prevalence of mental health problems among university students, but less attention was given to their underlying determinants. More knowledge is needed on the determinants of mental health problems among university students to develop effective interventions to promote mental health in the academic environment.

In working populations, the Effort-Reward Imbalance model has been successfully used to study the determinants of mental health problems (Hinsch et al., 2019; van Vegchel et al., 2005). There is empirical support that high effort in combination with low reward, so-called effort-reward imbalance (ERI), and overcommitment increase the risk of health problems such as depression (Hinsch et al., 2019; van Vegchel et al., 2005). Recently, the validity of the model was broadened to the student setting, where effort was defined as high study load, and reward as esteem, feeling respected in the academic environment and future work prospective (Portoghese et al., 2019; Wege et al., 2017). To date, only a few studies demonstrated that high effort, low reward, ERI and high overcommitment were associated with burnout, depressive and anxiety symptoms among university students (Hilger-Kolb et al., 2018; Hodge et al., 2019). Furthermore, no studies explored whether ERI and overcommitment could partly explain the higher prevalence of mental health problems among female compared to male university students.

The aims of this study are to 1) explore mental health among Italian university students; 2) the association of ERI and overcommitment with mental health; and 3) to what extent ERI and overcommitment explain gender differences in mental health.

METHODS

Study design, study sample and recruitment

Cross-sectional data were collected among Italian university students (Ministero dell'Istruzione dell'Università e della Ricerca). Data were collected with an online questionnaire implemented in LimeSurvey®, available from the 11th to the 23rd of December 2018. Respondents were recruited through web platforms commonly used by students for academic-related announcements, and through a public invitation on social media. Participants were informed about the study and provided digital informed consent. Given to the explorative aim of this observational study and the absence of follow up measurements, the questionnaire was anonymous and data were collected online in order to guarantee privacy to respondents. A total of 7773 individuals filled out the questionnaire. Individuals were included when (a) they gave information on mental health (n=6150) and ERI and overcommitment (n= 4883); (b) were aged between 18 and 35 (n=4852); (c) were enrolled in a bachelor's, master's or a combined degree (n=4783) and (d) they did report to be male or female (n=4760). Totally, 4760 (61.2%) individuals were included in the study.

No ethical approval is required in Italy for observational studies as they are not defined as medical/clinical research, referring to the Italian law 211/2003. This study complied with the Declaration of Helsinki and with the Italian privacy law.

Measures

Mental health. Psychological distress assessed with the Kessler Psychological Distress Scale (K10) was used as indicator of mental health (Kessler et al., 2003). A wide range of mental disorders is typically characterized by a high level of psychological distress (Andrews and Slade, 2001). Measuring the level of generic psychological distress, compared with the use of a specific diagnosis, allows to investigate mental health with a broader approach and taking into account the severity of the condition (Kessler et al., 2010). Moreover, psychological distress is the most common mental health problem among university students (Benton et al., 2003; Gibbons et al., 2019). The K10 includes ten items (Cronbach's $\alpha=0.91$), investigating how often the person has been experiencing a specific feeling (such as tiredness, hopelessness, worthlessness), over the past 30 days, with answers ranging from (1)"none of the time" to (5)"all of the time". The scores ranged from 10 to 50, with higher scores

indicating higher levels of psychological distress. Respondents were divided into four groups based on their sum score: individuals experiencing no psychological distress (10-19), and individuals experiencing mild (20-24), moderate (25-29) or severe (30-50) levels of psychological distress (Andrews and Slade, 2001). Respondents experiencing a low level of psychological distress were used as reference in the analysis.

ERI model. Effort, reward, and overcommitment were measured with the Effort-Reward Imbalance – Student Questionnaire (ERI-SQ), a version of the ERI questionnaire adapted to the student setting (Wege et al., 2017). The Italian version consists of 12 items and three subscales: effort (two items, Spearman's coefficient=0.56) investigating the feelings toward the study workload (e.g. feeling being constantly under pressure due to the study workload), reward (five items, Cronbach's α=0.68) investigating the perception of being treated fairly by peers and university staff, receiving proper credits, and job prospective, and overcommitment (five items, Cronbach's α=0.77) investigating the constant thinking of academic duties and the ability to disconnect from studying (Portoghese et al., 2019). All items are scored on a 4-point Likert-scale ranging from 1 (strongly disagree) to 4 (strongly agree). A lower score is more favourable for effort and overcommitment, while a higher score is more favourable for reward. ERI was estimated using the effort-reward ratio calculated with the algorithm "(effort score)/[(reward score)*(correction factor)]", with a correction factor (0.4) accounting for the different number of items investigating effort and reward(Siegrist et al., 2004). A higher ERI indicated an imbalance with higher effort than reward. For each of the four considered dimensions, individuals were divided into three groups (low, middle, high) according to the 33rd and 67th percentiles. The groups with low effort, high reward, low ERI and low overcommitment were used as references.

Sociodemographics. Information concerning gender, age, work, living-studying location, type of degree and discipline were collected. With regards to gender, respondents could indicate whether they would define themselves as female, male, other, or prefer to not declare. Only female and male individuals were included in the study. Since only six respondents answered gender with 'other', they were excluded from the gender-stratified analyses. Students with paid work were those who reported having paid employment next to study. The variable "living-studying location" classified students into three categories: (i) students who study in the city they lived in with their family before enrolling university ("studying in hometown"), (ii) students who travel on a daily basis from another town to reach the university ("commuting for studying"), and (iii) students who moved to a new city to study ("moved for studying"). Italian higher education includes three different types of degree: (i) Bachelor's degree of the duration of three years, (ii) Master's degree of the duration of 2 years, and (iii) "combined degree" for specific disciplines only and of the duration of 5 (e.g. law) or 6 (e.g. medicine, dentistry) years combining the bachelor's and master's degree.

Statistical Analyses

Descriptive statistics stratified by gender were used to present the characteristics of the study population. The presence of gender differences was investigated using T-tests (psychological distress, effort, reward, ERI, overcommitment, age) and Chi-squared tests (paid work, living-studying location, type of degree).

Analysis of Variance (ANOVA) with Post Hoc test according to Tukey was used to analyse the differences in psychological distress across sociodemographic subgroups. A clustered boxplot was drawn to explore the distribution of the population in terms of psychological distress across the type of degree. Multiline charts showing means and 95% confidence intervals were drawn to explore trends in effort, reward and overcommitment across age.

Spearman's coefficients were estimated as measures of the correlation between effort, reward, ERI, and overcommitment to verify multicollinearity between independent variables.

Adjusted odd ratios (ORs) with corresponding 95% confidence intervals (95% CI) were estimated to study the associations between effort, reward, ERI, overcommitment, and psychological distress. The multinomial logistic regression allowed comparisons of individuals with no psychological distress, used as a reference, with individuals experiencing

mild, moderate, and severe psychological distress. The multinomial logistic regression was stratified by gender, and adjusted for sociodemographic factors. , An interaction analysis for performed to investigate the presence of interaction between gender with effort, reward, ERI and overcommitment in their association with psychological distress.

A multistep multinomial logistic regression was used to investigate if and to what extent ERI and overcommitment explained the association between gender and psychological distress. In the first model, the unadjusted ORs of gender for psychological distress were estimated. The second model took into account sociodemographic factors, and the third model also included ERI and overcommitment.

All analyses were performed using IBM Statistics SPSS 25 (IBM, 2019).

RESULTS

Exploring mental health among university students

The study population consisted of 3586 females (75.3%) and 1174 males (24.7%) (**Table 1**). Most participants were medical students (42.9%), followed by students of architecture and design (9.7%), engineering (8.5%), languages (4.0%) and economics (3.9%).

In total, 78.5% of the respondents experienced psychological distress, of which 21.3% mild, 21.1% moderate, and 36.1% severe levels. Female students (39.1%) were more likely to report severe psychological distress compared to male students (26.8%). Psychological distress among female (M= 27.4, SD= 8.3) was significantly higher (F= 97.885, p= 0.001) than among male students (M= 24.6, SD= 8.1). Among female students, a statistically significant difference in psychological distress was found for the living-studying location (F= 5.318, p= 0.005). The post-hoc test indicated that commuters reported a significantly higher level of psychological distress (M= 28.0, SD= 8.3) compared to those studying in their hometown (p= 0.006) and those who moved for studying (p= 0.029). Among male students, no significant differences were found across living-studying location (F=0.920, p=0.399). Significant differences in psychological distress were found across type of degree among females (F= 6.811, p= 0.001) and males (F= 6.153, p=0.002). Among female students, the post-hoc test showed that psychological distress was significantly higher among those enrolled in a bachelor's degree (M= 27.9, SD= 8.4) compared to those enrolled in a master's degree (p= 0.001) or in a combined degree (p= 0.001). Among male students, the post-hoc test indicated that those enrolled in a master's degree (M= 22.6, SD= 7.6) reported significantly lower level of psychological distress compared to those enrolled in a bachelor's

degree (p= 0.018) or in a combined degree (p= 0.001)(**Figure 1**). More information can be found in **Table 2**.

Concerning the ERI model factors, with older age, reward decreased while effort and overcommitment increased both among female and male students (**Figure 2**). The changes of effort, reward and overcommitment with age were statistically significant both in men and women (**Supplementary file, Table A**).

The association of ERI and overcommitment with mental health

Spearman's coefficients (r_s) showed that overcommitment was moderately correlated with effort (r_s= 0.56), ERI (r_s= 0.50) (**Supplementary file, Table B**).

Among male and female students, high effort, low reward, high ERI and high overcommitment were statistically significantly associated with psychological distress (**Table 3**). The strength of the associations increased with the severity of psychological distress with ORs up to 22.2 (95% CI= 16.1-30.7) for the highest level of psychological distress. The strength of the associations between the ERI model factors and psychological distress increased with a higher level of effort, ERI and overcommitment, and with a lower level of reward. The only exception to this trend concerned the association of effort and ERI with mild psychological distress among male students.

Gender difference in mental health: the impact of effort-reward imbalance and overcommitment

No statistically significant interaction effect was found between gender with effort, reward, ERI, overcommitment and psychological distress.

The association between gender and psychological distress did not change significantly after adjustment for sociodemographic factors (**Table 4**). The strength of the association between being a female student and psychological distress attenuated after additional adjustment for ERI and overcommitment from OR 2.3 (95% CI= 1.9-2.7) to OR 1.4 (95% CI= 1.2-1.7).

DISCUSSION

In this study, over a third of the students experienced a severe level of psychological distress in the previous month. Female students were more likely to report psychological distress than male students. Students reporting higher effort, lower reward, higher effort-reward imbalance, and higher overcommitment were more likely to experience psychological

distress, these associations were stronger with higher levels of psychological distress. The higher prevalence of psychological distress among female students could partly be explained by effort, reward and overcommitment.

Mental health among university students: psychological distress as indicator

Generic psychological distress was measured as an indicator of mental health for several reasons. Firstly, psychological distress is the most prevalent university students' mental health problem (Gibbons et al., 2019; Tsouros et al., 1998). Secondly, we aimed to investigate mental health status among university students with a more comprehensive approach taking into account the severity of the mental health problems. The impact of mental health problems varies across different conditions but also within the same condition depending on the severity. Measuring the level of psychological distress allowed us to take into account the severity of the mental health problem rather than the presence of a specific condition only (Salomon et al., 2015). Thirdly, we wanted to avoid focusing on specific disorders only because in the literature there is a lack concerning (i) mental health among Italian university students, (ii) application of ERI model in the university setting and (iii) the use of the ERI model to explain gender difference. A general approach was preferable, leaving more specific investigation into specific conditions for future studies. Nevertheless, a K10 score of 20 or above discriminates well between individuals who meet the Composite International Diagnostic Interview criteria for anxiety and depression and those who do not (Andrews and Slade, 2001). K10 scores between 20 and 24, 25 and 29, and above 30 were associated with a likelihood of having a mild, a moderate and a severe mental disorder (Furukawa et al., 2003; Rural and Regional Health and Aged Care Services; Stallman, 2010).

In our population of students, the high prevalence of mild (21.3%), moderate (21.1%) and severe (36.1%) levels of psychological distress suggests a high prevalence of mental disorders (Andrews and Slade, 2001; Furukawa et al., 2003; Kessler et al., 2010, 2003; Rural and Regional Health and Aged Care Services). According to the Global Burden of Diseases 2017 (GBD2017), the prevalence of mental disorders among Italians was 17.5% in the group aged 20-24 years, and 17.1% among those aged 25-29 years (Institute for Health Metrics and Evaluation (IHME), 2017) being anxiety and depressive disorders the most common conditions. There are different possible explanations for the higher prevalence in our study than the GBD2017 (Institute for Health Metrics and Evaluation (IHME), 2017). Firstly, the GBD2017 took into account only some specific mental conditions, excluding others such as

personality disorders which are highly prevalent (Lenzenweger et al., 2007) and characterized by psychological distress. Secondly, the level of psychological distress is higher among university students than among the general population in the same age groups (Stallman, 2010). Females and medical students are at higher risk for anxiety and depressive disorders (Kessler et al., 1994; Smith et al., 2018). In our sample, both represented a more significant share than they actually do at national level (Istituto Nazionale di Statistica (Istat), 2019). Nevertheless, our findings suggest that psychological distress is highly prevalent among Italian university students, and consequently, they might be at high risk for mental disorders (Andrews and Slade, 2001; Furukawa et al., 2003; Kessler et al., 2010, 2003; Rural and Regional Health and Aged Care Services).

At university like at work: effort-reward imbalance and overcommitment matter.

The ERI model successfully explains mental health problems among workers (Hinsch et al., 2019; van Vegchel et al., 2005), and this study shows that the ERI model might do the same also in the university setting. Effort, reward, and overcommitment are important modifiable factors and if longitudinal studies will confirm our findings, not only effort and reward separately but also their (im)balance needs to be taken into account by universities' staff to plan effective interventions to promote mental health among students. ERI had a stronger association with severe levels of psychological distress compared with the effort and reward alone.

The imbalance between effort and reward might be tackled by decreasing the effort or by increasing the reward. The ERI model takes into account the perceived effort, which depends on an objective component (e.g. study demands) and a subjective component (e.g. personal resources to accomplish the duties). Hence, universities can address planning and content of educational programmes in order to assure an appropriate study load as well as using teaching methods that enhance students' motivation (Karsenti and Thibert, 1994). Instead, the subjective component is related to the way students deal with the effort. Students reported their willingness to increase their knowledge concerning coping strategies and study-related stress management (Reeve et al., 2013). A few interventions at organizational level such as changes in the evaluation and the grading system (Kerdijk et al., 2013; Reed et al., 2011), and at individual level such as stress-management training, mindfulness and yoga (Akeman et al., 2019; Carpena et al., 2019; O'Driscoll et al., 2019; Regehr et al., 2012; Stillwell et al., 2017),

were found to be effective to reduce psychological distress among students. Increasing resilience, defined as the ability to withstand and recover from mental hardship successfully (Herrman et al., 2011), might result in a decrease of the perceived effort. A study found that higher resilience was associated with a lower level of psychological distress among university students (Bacchi and Licinio, 2017).

Among the five items investigating reward, three referred to the feeling of "being fairly treated" at the university, by staff and peers. Consequently, our findings suggest that promoting good relationships with staff and peers might lead to an increase in perceived reward, which is associated with decreased psychological distress. A more supportive academic climate might be achieved with interventions at a group (e.g. mentor programs, extracurricular activities) (Hwang et al., 2017) and individual level (e.g. interpersonal psychotherapy) (Li et al., 2019).

Among the three dimensions investigated by the ERI model, overcommitment was the one with the strongest association with psychological distress. In the ERI-SQ, overcommitment was investigated by asking information concerning constant thinking of academic duties, and the ability of the student to disconnect from studying once the study time is finished. University students indicated study-life balance as a major stressor and declared to be interested in learning more about it, and in increasing their knowledge about school-related stress management and about coping strategies (Gibbons et al., 2019; Stallman and Hurst, 2016). More research is needed to understand better the overcommitment among students.

Gender differences but the real cause is often elsewhere

Women are more likely to suffer from anxiety and depressive disorders (Gibson et al., 2016; Institute for Health Metrics and Evaluation (IHME), 2017; Kessler et al., 1994; Smith et al., 2018), which are the mental disorders with the strongest association with psychological distress measured with the K10 (Andrews and Slade, 2001). Gender differences in mental health problems were also found among university students, with female students more likely to report a higher level of psychological distress (Auerbach et al., 2018; Backović et al., 2012; Beiter et al., 2015; Chow and Choi, 2019; Fond et al., 2018; Liu et al., 2019; Othieno et al., 2014; Stewart et al., 2019; Wu et al., 2016).

In our sample, females reported more psychological distress than males with increasing differences with higher severity of psychological distress. Our findings confirm that gender matters in mental health. However, gender differences are often caused by other factors rather

than gender itself. Some authors suggested the gender difference in mental problems may be due to (i) a reduced likelihood of men's mental problems to be detected(Martin et al., 2013), and (ii) a lower likelihood of studies with no gender difference to be published (Franco et al., 2014). In our study, three main findings may contribute to the literature on this topic. Firstly, we did not find a significant interaction between gender with effort, reward, ERI and overcommitment in their associations with psychological distress, suggesting that effort, reward, ERI and overcommitment may have a similar effect on female and male individuals. Secondly, female students experience high effort, low reward, high ERI and high overcommitment more often and higher level than their male peers and this higher exposures could contributes to the gender difference in psychological distress. Thirdly, the gender difference in psychological distress decreased after adjustments for ERI and overcommitment. In order to truly explain gender differences in mental health problems, we may refer to other factors which might also explain within-gender differences (Pacheco et al., 2019), such as socioeconomic status and educational level, pattern of behaviours to socialize, attitude toward help-seeking and coping strategies (Bildt and Michélsen, 2002; Ennis et al., 2019; Miranda-Mendizabal et al., 2019; Smith et al., 2018; Vermeulen and Mustard, 2000). A meta-analysis on 308 educational programs worldwide reported that female students performed consistently better than male students (Voyer and Voyer, 2014). In Italy, female students graduate more often on time (57.9% vs 52.6%) and with higher grades (103.8/110 vs 102.0/110) then male students (AlmaLaurea, 2020). This could be somehow related with psychosocial aspects such as higher overcommitment, and results in a higher risk of psychological distress and mental health problems.

Future studies should better investigate the determinants and mechanisms behind the gender difference rather than merely testing their presence.

Strengths and Limitations

The use of the validated and internationally broadly applied K10 to measure psychological distress due to its clinical relevance is a strength of our study. Contrarily, the use of the Italian version of the ERI-SQ may be a limitation due to its acceptable but limited psychometric properties (Portoghese et al., 2019). Despite it represents only a small share of the total university student population (total target population: 1.720.048, in 2018-2019), the large sample size is a strength of our study. However, our sample does not allow a stratified analysis across all study disciplines. In an additional analysis we noted that the reported

associations between effort, reward, and overcommitment with psychological distress did not differ across the three largest studies, given some credence to the generalisability of the findings.

The data collection through a snowball technique came with strengths and weaknesses. The study population was a convenience sample with a possible selection bias which limits the generalizability of our results on the prevalence of mental health problems to the general population. Although the prevalence of mental health problems might be higher compared to the general population, we do not expect that the associations would differ from a broader population. The online snowball is convenient when aiming to reach hidden populations. University students experiencing mental disorders might be less likely to attend lectures and consequently, to fill out a paper-and-pencil questionnaire while being at the university. Moreover, due to the sensitivity of the topic, the online data collection provided more privacy and anonymity to respondents. Nevertheless, the use of an online data collection and online platforms might also have led to a common-method variance.

The cross-sectional nature of our study does not allow to identify a temporal association between effort, reward, ERI, overcommitment, and psychological distress. Further studies are needed in order to investigate this temporality as a mandatory requirement to suggest a causal relationship between effort, reward, ERI overcommitment, and psychological distress.

CONCLUSION

This study shows a high prevalence of psychological distress among Italian university students, in particular among female students. Our findings suggest that high effort, low reward, ERI and high overcommitment are associated with a higher level of psychological distress among university students. These factors also partly explain the higher prevalence of psychological distress among female students compared to male students. Concerning the high prevalence of psychological distress, there is a need for effective interventions to prevent mental health problems among students. The imbalance between effort and reward as well as overcommitment are potentially modifiable risk factors to target interventions. Longitudinal studies are needed to confirm that ERI and overcommitment are modifiable determinants of university students' mental health.

AVAILABILITY OF THE DATA

Raw data pertaining to analyses performed in this study are available from the authors upon reasonable request. Proposals for research based on these data are welcome and can be sent to unicares@erasmusmc.nl.

CONTRIBUTORS

FP, SR, and AB designed the study. FP, SR, IP and AB contributed to the development of the questionnaire. FP collected and analysed the data. FP wrote the manuscript. SR, UB, IP, MC and AB helped to draft the manuscript.

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DECLARATIONS OF INTEREST

None.

References

Akeman, E., Kirlic, N., Clausen, A.N., Cosgrove, K.T., McDermott, T.J., Cromer, L.D., Paulus, M.P., Yeh, H.-W., Aupperle, R.L., 2019. A pragmatic clinical trial examining the impact of a resilience program on college student mental health. Depress. Anxiety. https://doi.org/10.1002/da.22969

AlmaLaurea, 2020. Profilo dei Laureati [WWW Document]. URL https://www2.almalaurea.it/cgi-php/universita/statistiche/tendine.php? (accessed 7.30.20).

Andrews, G., Slade, T., 2001. Interpreting scores on the Kessler Psychological Distress Scale (K10). Aust. N. Z. J. Public Health 25, 494–497. https://doi.org/10.1111/j.1467-842x.2001.tb00310.x

Auerbach, R.P., Mortier, P., Bruffaerts, R., Alonso, J., Benjet, C., Cuijpers, P., Demyttenaere, K., Ebert, D.D., Green, J.G., Hasking, P., Murray, E., Nock, M.K., Pinder-Amaker, S., Sampson, N.A., Stein, D.J., Vilagut, G., Zaslavsky, A.M., Kessler, R.C., WHO WMH-ICS Collaborators, 2018. WHO World Mental Health Surveys International College Student Project: Prevalence and distribution of mental disorders. J. Abnorm. Psychol. 127, 623–638. https://doi.org/10.1037/abn0000362

Bacchi, S., Licinio, J., 2017. Resilience and Psychological Distress in Psychology and Medical Students. Acad. Psychiatry J. Am. Assoc. Dir. Psychiatr. Resid. Train. Assoc. Acad. Psychiatry 41, 185–188. https://doi.org/10.1007/s40596-016-0488-0

Backović, D.V., Zivojinović, J.I., Maksimović, J., Maksimović, M., 2012. Gender differences in academic stress and burnout among medical students in final years of education. Psychiatr. Danub. 24, 175–181.

Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., Sammut, S., 2015. The prevalence and correlates of depression, anxiety, and stress in a sample of college students. J. Affect. Disord. 173, 90–96. https://doi.org/10.1016/j.jad.2014.10.054

Benton, S.A., Robertson, J.M., Tseng, W.-C., Newton, F.B., Benton, S.L., 2003. Changes in counseling center client problems across 13 years. Prof. Psychol. Res. Pract. 34, 66–72. https://doi.org/10.1037/0735-7028.34.1.66

Bildt, C., Michélsen, H., 2002. Gender differences in the effects from working conditions on mental health: a 4-year follow-up. Int. Arch. Occup. Environ. Health 75, 252–258. https://doi.org/10.1007/s00420-001-0299-8

Carpena, M.X., Tavares, P. de S., Menezes, C.B., 2019. The effect of a six-week focused meditation training on depression and anxiety symptoms in Brazilian university students with 6 and 12 months of follow-up. J. Affect. Disord. 246, 401–407. https://doi.org/10.1016/j.jad.2018.12.126

Chow, S.K.Y., Choi, E.K.Y., 2019. Assessing the Mental Health, Physical Activity Levels, and Resilience of Today's Junior College Students in Self-Financing Institutions. Int. J. Environ. Res. Public. Health 16. https://doi.org/10.3390/ijerph16173210

Duffy, M.E., Twenge, J.M., Joiner, T.E., 2019. Trends in Mood and Anxiety Symptoms and Suicide-Related Outcomes Among U.S. Undergraduates, 2007–2018: Evidence From Two National Surveys. J. Adolesc. Health 65, 590–598. https://doi.org/10.1016/j.jadohealth.2019.04.033

Ennis, E., McLafferty, M., Murray, E., Lapsley, C., Bjourson, T., Armour, C., Bunting, B., Murphy, S., O'Neill, S., 2019. Readiness to change and barriers to treatment seeking in college students with a mental disorder. J. Affect. Disord. 252, 428–434. https://doi.org/10.1016/j.jad.2019.04.062

Fond, G., Bourbon, A., Auquier, P., Micoulaud-Franchi, J.-A., Lançon, C., Boyer, L., 2018. Venus and Mars on the benches of the faculty: Influence of gender on mental health and behavior of medical students. Results from the BOURBON national study. J. Affect. Disord. 239, 146–151. https://doi.org/10.1016/j.jad.2018.07.011

Franco, A., Malhotra, N., Simonovits, G., 2014. Social science. Publication bias in the social sciences: unlocking the file drawer. Science 345, 1502–1505. https://doi.org/10.1126/science.1255484

Furukawa, T.A., Kessler, R.C., Slade, T., Andrews, G., 2003. The performance of the K6 and K10 screening scales for psychological distress in the Australian National Survey of Mental Health and Well-Being. Psychol. Med. 33, 357–362. https://doi.org/10.1017/s0033291702006700

Gibbons, S., Trette-McLean, T., Crandall, A., Bingham, J.L., Garn, C.L., Cox, J.C., 2019. Undergraduate students survey their peers on mental health: Perspectives and strategies for improving college counseling center outreach. J. Am. Coll. Health 67, 580–591. https://doi.org/10.1080/07448481.2018.1499652

Gibson, P.A., Baker, E.H., Milner, A.N., 2016. The role of sex, gender, and education on depressive symptoms among young adults in the United States. J. Affect. Disord. 189, 306–313. https://doi.org/10.1016/j.jad.2015.08.067

Herrman, H., Stewart, D.E., Diaz-Granados, N., Berger, E.L., Jackson, B., Yuen, T., 2011. What is Resilience? Can. J. Psychiatry 56, 258–265. https://doi.org/10.1177/070674371105600504

Hilger-Kolb, J., Diehl, K., Herr, R., Loerbroks, A., 2018. Effort-reward imbalance among students at German universities: associations with self-rated health and mental health. Int. Arch. Occup. Environ. Health 91, 1011–1020. https://doi.org/10.1007/s00420-018-1342-3

Hinsch, D.M., Spanier, K., Radoschewski, F.M., Bethge, M., 2019. Associations between overcommitment, effort-reward imbalance and mental health: findings from a longitudinal study. Int. Arch. Occup. Environ. Health 92, 559–567. https://doi.org/10.1007/s00420-018-1391-7

Hodge, B., Wright, B., Bennett, P., 2019. Balancing Effort and Rewards at University: Implications for Physical Health, Mental Health, and Academic Outcomes. Psychol. Rep. 33294119841845. https://doi.org/10.1177/0033294119841845

Hwang, I.C., Park, K.H., Kim, J.J., Yim, J., Ko, K.P., Bae, S.M., Kyung, S.Y., 2017. Perceived Social Support as a Determinant of Quality of Life Among Medical Students: 6-Month Follow-up Study. Acad. Psychiatry J. Am. Assoc. Dir. Psychiatr. Resid. Train. Assoc. Acad. Psychiatry 41, 180–184. https://doi.org/10.1007/s40596-016-0503-5

IBM, 2019. SPSS Statistics 25 [WWW Document]. URL https://www.ibm.com/support/pages/downloading-ibm-spss-statistics-25 (accessed 12.12.19).

Institute for Health Metrics and Evaluation (IHME), 2017. Global Burden of Disease Study 2017 (GBD 2017) Data Resources [WWW Document]. URL http://ghdx.healthdata.org/gbd-2017 (accessed 11.4.19).

Istituto Nazionale di Statistica (Istat), 2019. Condizioni di vita, reddito e carico fiscale delle famiglie [WWW Document]. Istat. URL https://www.istat.it/it/files//2018/12/Report-Reddito-Condizioni-di-vita-2017.pdf (accessed 6.25.19).

Karsenti, T., Thibert, G., 1994. The Relationship between Teaching Style and Within-Term Changes in Junior-College Student Motivation.

Kerdijk, W., Tio, R.A., Mulder, B.F., Cohen-Schotanus, J., 2013. Cumulative assessment: strategic choices to influence students' study effort. BMC Med. Educ. 13, 172. https://doi.org/10.1186/1472-6920-13-172

Kessler, R.C., Barker, P.R., Colpe, L.J., Epstein, J.F., Gfroerer, J.C., Hiripi, E., Howes, M.J., Normand, S.-L.T., Manderscheid, R.W., Walters, E.E., Zaslavsky, A.M., 2003. Screening for serious mental illness in the general population. Arch. Gen. Psychiatry 60, 184–189. https://doi.org/10.1001/archpsyc.60.2.184

Kessler, R.C., Green, J.G., Gruber, M.J., Sampson, N.A., Bromet, E., Cuitan, M., Furukawa, T.A., Gureje, O., Hinkov, H., Hu, C., Lara, C., Lee, S., Mneimneh, Z., Myer, L., Oakley-Browne, M., Posada-Villa, J., Sagar, R., Viana, M.C., Zaslavsky, A.M., 2010. Screening for Serious Mental Illness in the General Population with the K6 screening scale: Results from the WHO World Mental Health (WMH) Survey Initiative. Int. J. Methods Psychiatr. Res. 19, 4–22. https://doi.org/10.1002/mpr.310

Kessler, R.C., McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., Wittchen, H.U., Kendler, K.S., 1994. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. Arch. Gen. Psychiatry 51, 8–19. https://doi.org/10.1001/archpsyc.1994.03950010008002

Lenzenweger, M.F., Lane, M.C., Loranger, A.W., Kessler, R.C., 2007. DSM-IV personality disorders in the National Comorbidity Survey Replication. Biol. Psychiatry 62, 553–564. https://doi.org/10.1016/j.biopsych.2006.09.019

Li, Y., Roslan, S.B., Ahmad, N.A.B., Omar, Z.B., Zhang, L., 2019. Effectiveness of group interpersonal psychotherapy for decreasing aggression and increasing social support among Chinese university students: A randomized controlled study. J. Affect. Disord. 251, 274–279. https://doi.org/10.1016/j.jad.2018.12.051

Liu, Y., Zhang, N., Bao, G., Huang, Y., Ji, B., Wu, Y., Liu, C., Li, G., 2019. Predictors of depressive symptoms in college students: A systematic review and meta-analysis of cohort studies. J. Affect. Disord. 244, 196–208. https://doi.org/10.1016/j.jad.2018.10.084

Martin, L.A., Neighbors, H.W., Griffith, D.M., 2013. The experience of symptoms of depression in men vs

women: analysis of the National Comorbidity Survey Replication. JAMA Psychiatry 70, 1100–1106.

https://doi.org/10.1001/jamapsychiatry.2013.1985

Ministero dell'Istruzione dell'Università e della Ricerca, 2019. Data dell'istruzione superiore (Iscritti per anno

accademico) [WWW Document]. URL http://dati.ustat.miur.it/dataset/iscritti/resource/e76fcb62-

22c5-4ff9-a425-e06f3d6f8330?inner_span=True (accessed 12.11.19).

Miranda-Mendizabal, A., Castellví, P., Alayo, I., Vilagut, G., Blasco, M.J., Torrent, A., Ballester, L., Almenara, J.,

Lagares, C., Roca, M., Sesé, A., Piqueras, J.A., Soto-Sanz, V., Rodríguez-Marín, J., Echeburúa, E.,

Gabilondo, A., Cebrià, A.I., Bruffaerts, R., Auerbach, R.P., Mortier, P., Kessler, R.C., Alonso, J., 2019.

Gender commonalities and differences in risk and protective factors of suicidal thoughts and

behaviors: A cross-sectional study of Spanish university students. Depress. Anxiety 36, 1102–1114.

https://doi.org/10.1002/da.22960

O'Driscoll, M., Byrne, S., Byrne, H., Lambert, S., Sahm, L.J., 2019. An online mindfulness-based intervention for

undergraduate pharmacy students: Results of a mixed-methods feasibility study. Curr. Pharm. Teach.

Learn. 11, 858–875. https://doi.org/10.1016/j.cptl.2019.05.013

Othieno, C.J., Okoth, R.O., Peltzer, K., Pengpid, S., Malla, L.O., 2014. Depression among university students in

Kenya: Prevalence and sociodemographic correlates. J. Affect. Disord. 165, 120–125.

https://doi.org/10.1016/j.jad.2014.04.070

Pacheco, J.P.G., Silveira, J.B., Ferreira, R.P.C., Lo, K., Schineider, J.R., Giacomin, H.T.A., Tam, W.W.S., 2019.

Gender inequality and depression among medical students: A global meta-regression analysis. J.

Psychiatr. Res. 111, 36–43. https://doi.org/10.1016/j.jpsychires.2019.01.013

Portoghese, I., Galletta, M., Porru, F., Burdorf, A., Sardo, S., D'Aloja, E., Finco, G., Campagna, M., 2019. Stress

among university students: factorial structure and measurement invariance of the Italian version of

the Effort-Reward Imbalance student questionnaire. BMC Psychol. 7, 68.

https://doi.org/10.1186/s40359-019-0343-7

Quek, T.T.-C., Tam, W.W.-S., Tran, B.X., Zhang, M., Zhang, Z., Ho, C.S.-H., Ho, R.C.-M., 2019. The Global

Prevalence of Anxiety Among Medical Students: A Meta-Analysis. Int. J. Environ. Res. Public. Health

16. https://doi.org/10.3390/ijerph16152735

Reed, D.A., Shanafelt, T.D., Satele, D.W., Power, D.V., Eacker, A., Harper, W., Moutier, C., Durning, S., Massie, F.S., Thomas, M.R., Sloan, J.A., Dyrbye, L.N., 2011. Relationship of pass/fail grading and curriculum structure with well-being among preclinical medical students: a multi-institutional study. Acad. Med. J. Assoc. Am. Med. Coll. 86, 1367–1373. https://doi.org/10.1097/ACM.0b013e3182305d81

Reeve, K.L., Shumaker, C.J., Yearwood, E.L., Crowell, N.A., Riley, J.B., 2013. Perceived stress and social support in undergraduate nursing students' educational experiences. Nurse Educ. Today 33, 419–424. https://doi.org/10.1016/j.nedt.2012.11.009

Regehr, C., Glancy, D., Pitts, A., 2012. Interventions to reduce stress in university students: a review and meta-analysis. Interv. Reduce Stress Univ. Stud. Rev. Meta-Anal. https://doi.org/10.1016/j.jad.2012.11.026

Rotenstein, L.S., Ramos, M.A., Torre, M., Segal, J.B., Peluso, M.J., Guille, C., Sen, S., Mata, D.A., 2016. Prevalence of Depression, Depressive Symptoms, and Suicidal Ideation Among Medical Students: A Systematic Review and Meta-Analysis. JAMA 316, 2214–2236. https://doi.org/10.1001/jama.2016.17324

Rural and Regional Health and Aged Care Services, 2001. Victorian population health survey 2001: Selected findings [WWW Document]. URL https://www2.health.vic.gov.au:443/about/publications/policiesandguidelines/Victorian-population-health-survey-2001-Selected-findings (accessed 11.7.19).

Salomon, J.A., Haagsma, J.A., Davis, A., Noordhout, C.M. de, Polinder, S., Havelaar, A.H., Cassini, A., Devleesschauwer, B., Kretzschmar, M., Speybroeck, N., Murray, C.J.L., Vos, T., 2015. Disability weights for the Global Burden of Disease 2013 study. Lancet Glob. Health 3, e712–e723. https://doi.org/10.1016/S2214-109X(15)00069-8

Siegrist, J., Starke, D., Chandola, T., Godin, I., Marmot, M., Niedhammer, I., Peter, R., 2004. The measurement of effort-reward imbalance at work: European comparisons. Soc. Sci. Med. 1982 58, 1483–1499. https://doi.org/10.1016/S0277-9536(03)00351-4

Smith, D.T., Mouzon, D.M., Elliott, M., 2018. Reviewing the Assumptions About Men's Mental Health: An Exploration of the Gender Binary. Am. J. Mens Health 12, 78–89. https://doi.org/10.1177/1557988316630953

Stallman, H.M., 2010. Psychological distress in university students: A comparison with general population data. Aust. Psychol. 45, 249–257. https://doi.org/10.1080/00050067.2010.482109

Stallman, H.M., Hurst, C.P., 2016. The University Stress Scale: Measuring Domains and Extent of Stress in University Students. Aust. Psychol. 51, 128–134. https://doi.org/10.1111/ap.12127

Stewart, G., Kamata, A., Miles, R., Grandoit, E., Mandelbaum, F., Quinn, C., Rabin, L., 2019. Predicting mental health help seeking orientations among diverse Undergraduates: An ordinal logistic regression analysis. J. Affect. Disord. 257, 271–280. https://doi.org/10.1016/j.jad.2019.07.058

Stillwell, S.B., Vermeesch, A.L., Scott, J.G., 2017. Interventions to Reduce Perceived Stress Among Graduate Students: A Systematic Review With Implications for Evidence-Based Practice. Worldviews Evid. Based Nurs. 14, 507–513. https://doi.org/10.1111/wvn.12250

Tsouros, A.D., Dowding, G., Thompson, J., Dooris, M., 1998. Health promoting universities: Concept, experience and framework for action 174.

van Vegchel, N., de Jonge, J., Bosma, H., Schaufeli, W., 2005. Reviewing the effort–reward imbalance model: drawing up the balance of 45 empirical studies. Soc. Sci. Med. 60, 1117–1131. https://doi.org/10.1016/j.socscimed.2004.06.043

Vermeulen, M., Mustard, C., 2000. Gender differences in job strain, social support at work, and psychological distress. J. Occup. Health Psychol. 5, 428–440. https://doi.org/10.1037/1076-8998.5.4.428

Voyer, D., Voyer, S.D., 2014. Gender differences in scholastic achievement: A meta-analysis. Psychol. Bull. 140, 1174–1204. https://doi.org/10.1037/a0036620

Wege, N., Li, J., Muth, T., Angerer, P., Siegrist, J., 2017. Student ERI: Psychometric properties of a new brief measure of effort-reward imbalance among university students. J. Psychosom. Res. 94, 64–67. https://doi.org/10.1016/j.jpsychores.2017.01.008

Wu, D., Rockett, I.R.H., Yang, T., Feng, X., Jiang, S., Yu, L., 2016. Deliberate self-harm among Chinese medical students: A population-based study. J. Affect. Disord. 202, 137–144. https://doi.org/10.1016/j.jad.2016.05.030

Figure 1. Clustered boxplot showing psychological distress (K10) by type of enrolled degree among 3586 female and 1174 male university students in Italy in 2018.
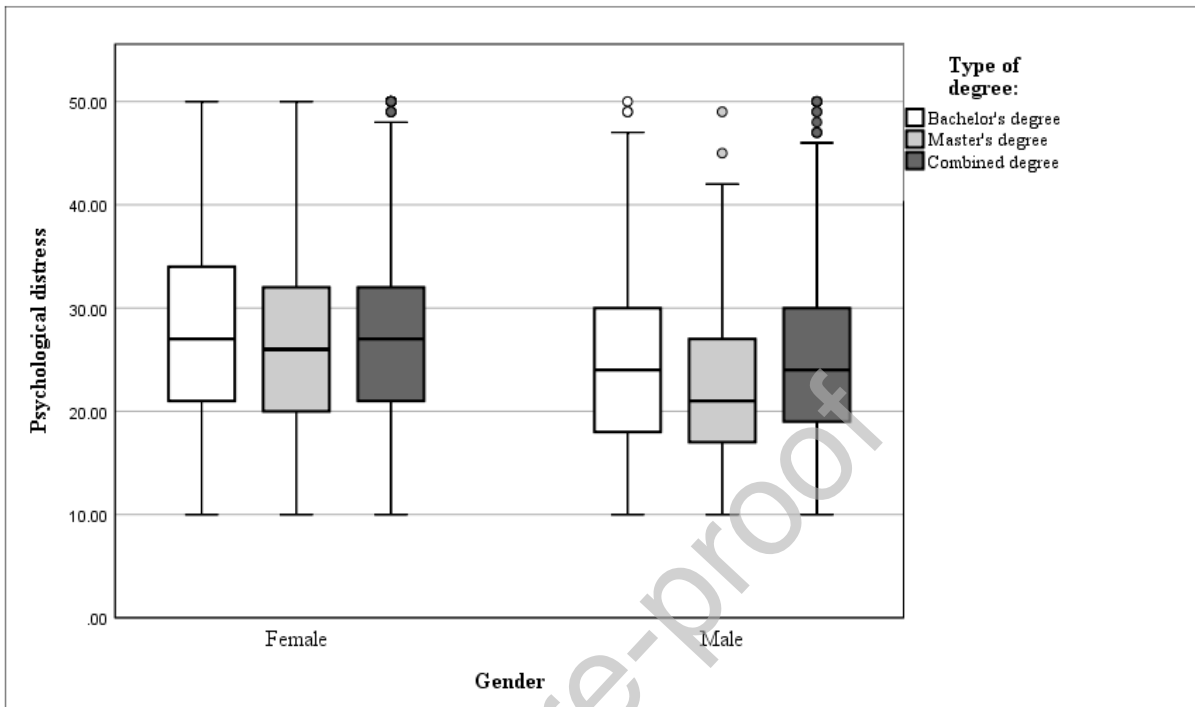

Figure 2. Mean scores with 95% confidence interval of effort, reward and overcommitment, by age among 3586 female and 1174 male university students in Italy in 2018.
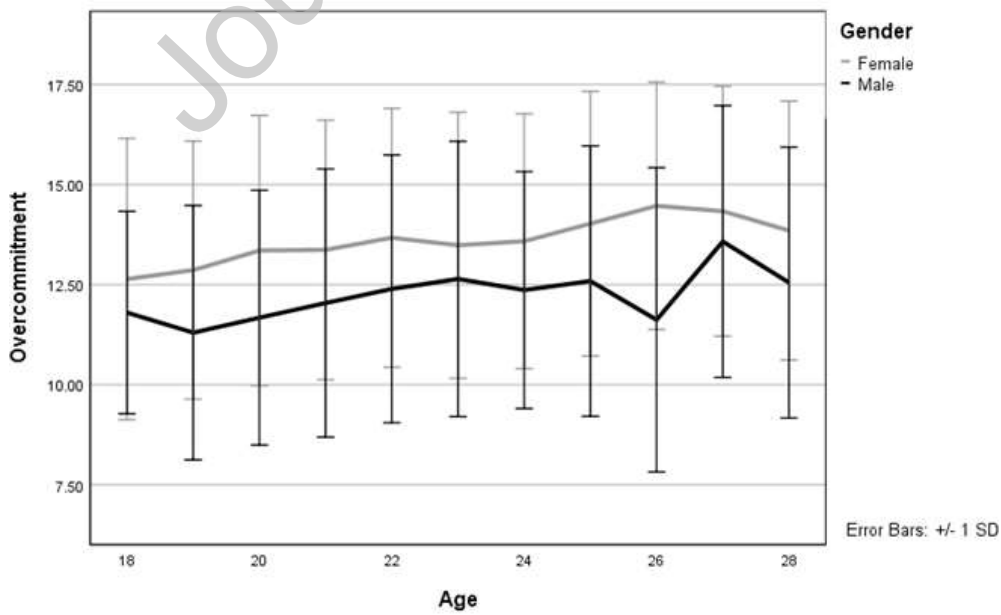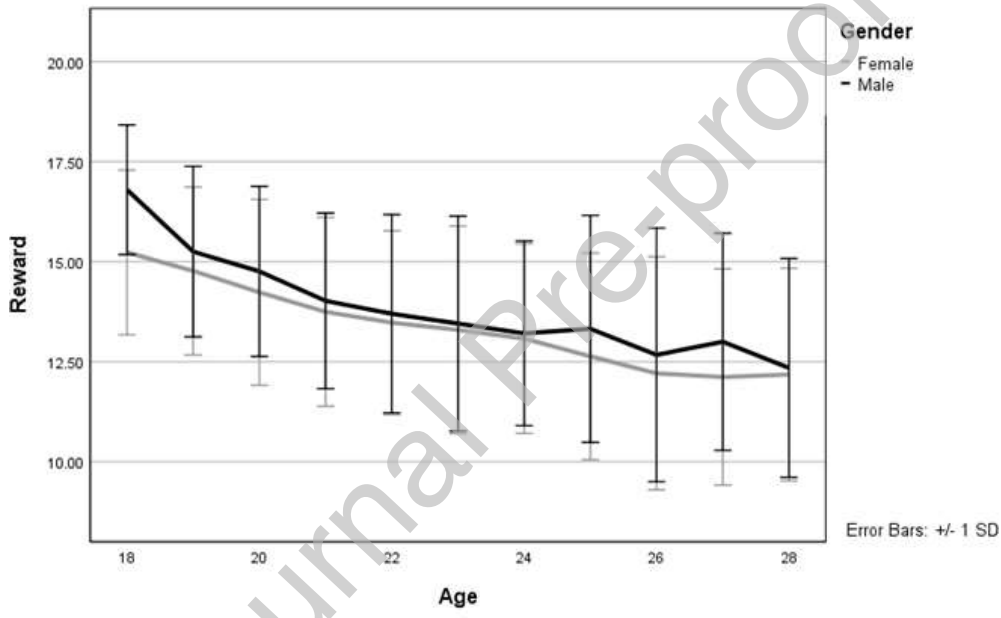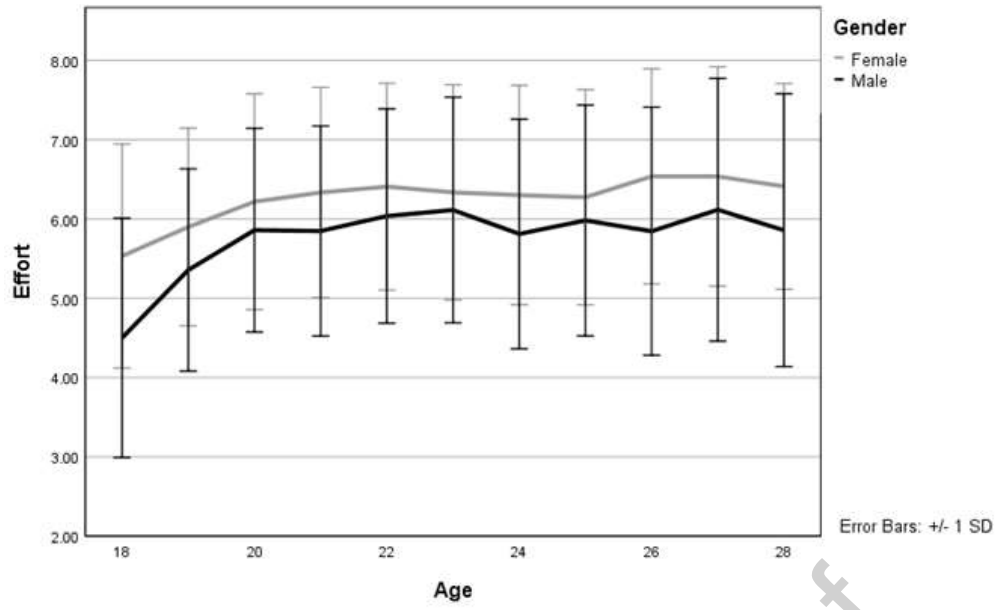
Table 1. Psychological distress, effort, reward, effort-reward imbalance (ERI), overcommitment and sociodemographic characteristics among 3586 female and 1174 male university students in Italy in 2018.

	Females (n=3586)		Males (n=1174)		Gender difference
	Mean	**SD**	**Mean**	**SD**	**T (p-value)**
Psychological distress (10-50) [1]	27.4	8.3	24.6	8.1	1.261 (0.000)
ERI factors					
Effort (2-8) [1]	6.3	1.3	5.9	1.4	0.139 (0.000)
Reward (5-20) [1]	13.5	2.5	13.8	2.6	0.350 (0.001)
ERI (0.25-4.0) [1]	1.2	0.4	1.1	0.5	0.016 (0.000)
Overcommitment (5-20) [1]	13.5	3.3	12.2	3.3	0.640 (0.000)
Sociodemographics					
Age (18-35) [1]	22.5	2.6	22.7	2.6	1.042 (0.078)
	N	**%**	**N**	**%**	$\chi 2$ **(p-value)**
Paid work (yes)	568	15.8	159	13.5	3.603 (0.058)
Living-studying location					
Studying in hometown	1049	29.3	406	34.6	15.567 (0.000)
Commuting for study	1086	30.3	298	25.4	
Moved for study	1451	40.5	470	40.0	
Type of degree					
Bachelor's degree	1317	36.7	374	31.9	9.360 (0.009)
Master's degree	443	12.4	162	13.8	
Combined degree	1826	50.9	638	54.3	

[1] Range

Table 2. Psychological distress across sociodemographic groups stratified by gender among 3586 female and 1174 male students in Italy in 2018.

	Females (n=3586)			Males (n=1174)		
	Psychological distress (K10)			Psychological distress (K10)		
	Mean (SD)	F-value	P-value	Mean (SD)	F-value	P-value
Age [1]						
< 23 year	27.5 (8.2)	1.040	0.308	24.5 (8.0)	0.183	0.669
≥ 23 year	27.2 (8.4)			24.7 (8.2)		
Paid work						
Yes	27.9 (8.2)	2.830	0.093	25.1 (8.4)	0.663	0.416
No	27.3 (8.3)			24.6 (8.1)		
Living-studying location						
Studying in hometown	26.9 (8.2)	5.318	0.005	24.2 (8.2)	0.920	0.399
Commuting for study	28.0 (8.3)			24.8 (8.1)		
Moved for study	27.2 (8.3)			24.9 (8.1)		
Type of degree						
Bachelor's degree	27.9 (8.4)	6.811	0.001	24.7 (8.1)	6.153	0.002
Master's degree	26.4 (8.3)			22.6 (7.6)		
Combined degree	27.2 (8.2)			25.1 (8.2)		

[1] Individuals were divided into two groups according to the mean.

Table 3. Associations of effort, reward, effort-reward imbalance (ERI), overcommitment with different levels of psychological distress, stratified by gender and presented per level of psychological distress, estimated with multinomial logistic regression, among 4760 university students in Italy in 2018.

	Psychological distress (K10) [1]					
	Females (n=3586)			Males (n=1174)		
	Mild [2] (n=724) OR (95% CI)	Moderate [2] (n=780) OR (95% CI)	Severe [2] (n=1403) OR (95% CI)	Mild [2] (n=289) OR (95% CI)	Moderate [2] (n=224) OR (95% CI)	Severe [2] (n=315) OR (95% CI)
Effort [3]						
- low (n= 1095)	1.0	1.0	1.0	1.0	1.0	1.0
- middle (n= 807)	1.7 (1.2-2.3)	2.8 (2.0-3.8)	3.8 (2.8-5.0)	2.4 (1.5-2.6)	3.2 (2.6-5.7)	3.8 (2.4-6.2)
- high (n= 2858)	2.9 (2.0-4.2)	6.5 (4.6-9.3)	13.5 (9.7-18.8)	1.2 (0.6-2.6)	6.8 (3.6-12.5)	15.3 (8.6-27.1)
Reward [3]						
- high (n= 2179)	1.0	1.0	1.0	1.0	1.0	1.0
- middle (n= 1578)	1.2 (0.9-1.5)	1.9 (1.4-2.5)	2.1 (1.6-2.7)	1.4 (0.9-2.0)	2.1 (1.3-3.2)	2.4 (1.5-3.8)
- low (n= 1003)	2.1 (1.6-2.7)	3.8 (2.9-5.1)	7.4 (5.6-9.6)	1.6 (1.1-2.5)	2.8 (1.7-4.4)	8.1 (5.1-13.0)
ERI [3]						
- low (n= 1618)	1.0	1.0	1.0	1.0	1.0	1.0
- middle (n= 1397)	1.4 (1.1-1.8)	3.3 (2.6-4.3)	4.0 (3.2-5.1)	2.5 (1.7-3.6)	3.3 (2.1-5.0)	4.7 (3.1-7.2)
- high (n= 1745)	3.0 (2.2-4.1)	8.3 (6.1-11.3)	18.7 (14.0-25.0)	1.9 (1.1-3.1)	6.9 (4.2-11.6)	19.9 (12.2-32.5)
Overcommitment [3]						
- low (n= 1227)	1.0	1.0	1.0	1.0	1.0	1.0
- middle (n= 1542)	2.3 (1.8-3.0)	4.0 (3.1-5.1)	4.9 (3.8-6.2)	2.3 (1.6-3.3)	2.6 (1.7-3.9)	6.6 (4.4-9.8)
- high (n= 1991)	3.1 (2.2-4.5)	7.9 (5.6-11.1)	22.2 (16.1-30.7)	2.6 (1.4-5.0)	6.4 (3.5-11.7)	22.1 (12.4-39.4)

[1] Reference are individuals with no psychological distress (females (n=679) and males (n=346)).
[2] Individuals were divided into four groups using as range ≤19 (low), 20-24 (mild), 25-29 (moderate), and ≥ 30 (severe)
[3] Individuals were divided into three groups using 33rd and 67th percentiles

Table 4. Associations between gender and different levels of psychological distress after multistep adjustment for sociodemographics, and effort-reward imbalance (ERI) and overcommitment, among 4760 university students in Italy in 2018.

	Psychological distress (K10) [1]

	Mild[2] (n=1013) OR (95% CI)	Moderate[2] (n= 1004) OR (95% CI)	Severe[2] (n= 1718) OR (95% CI)
Model 1: unadjusted (gender only) - Female (ref: male)	1.3 (1.1-1.5)	1.8 (1.5-2.2)	2.3 (1.9-2.7)
Model 2: model 1 adjusted for sociodemographics[3] - Female (ref: male)	1.3 (1.1-1.5)	1.8 (1.4-2.1)	2.2 (1.9-2.7)
Model 3: model 2 adjusted for ERI and overcommitment[4] - Female (ref: male)	1.1 (0.9-1.3)	1.3 (1.0-1.6)	1.4 (1.2-1.7)

[1] Reference were students with no psychological distress (n=1025)

[2] Individuals were divided into four groups using as range ≤ 19 (low), 20-24 (mild), 25-29 (moderate), and ≥ 30 (severe)

[3] adjusted for age, paid work, studying-living location, type of degree

[4] additionally adjusted for ERI and overcommitment