

The mental health of PhD students in Flanders

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RISK OF MENTAL HEALTH DISORDER AND THE GHQ-12

According to the World Health Organization, mental health is defined as a state of well-being in which every individual realizes his or her own potential, 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. This equilibrium is jeopardized by mental health problems and mental health disorders. Mental health disorders are conditions characterized by alterations in thinking, emotion or mood, or behaviour (or some combination thereof) associated with distress and/or impaired functioning. Mental health problems, which most people have experienced at some point in their lives, are signs and symptoms of insufficient intensity or duration to meet the criteria for a mental health disorder. The most common mental health disorders are anxiety and mood disorders, such as major (also often called clinical) depression.

In the current study we answer three important, previously unaddressed research questions, namely: (1) *How prevalent are mental health disorders in PhD students in Flanders?*, (2) *How does this prevalence compare to the highly educated general population?* and (3) *Are work organization and organizational policies in Flemish universities associated with a higher risk of mental health disorders in PhD students?*

In order to answer these questions, we make use of data from two surveys. The first is a survey conducted by ECOOM - the Centre for R&D Monitoring of the Flemish Community - in 2013 in the total population of junior researchers in all five universities in Flanders (see ECOOM-brief 8 on ECOOM-website). Mental health of junior researchers was measured

by the *General Health Questionnaire* (GHQ). The GHQ was developed as a screening instrument to identify psychological distress and potential cases of mental health disorder, leaving the actual clinical diagnosis of disorder to a psychiatric interview. The GHQ is probably the most common assessment of mental well-being worldwide. In the current study, we used the GHQ-12 item version, which measures an individual's experience of twelve symptoms in the past weeks as compared to his/her usual experience. The twelve symptoms are shown in Table 1. Most tap into depression and social dysfunction. We calculated the GHQ-score using the binary scoring method, which defines a symptom as present when it has been experienced more or much more than usual. Individuals with 4 or more symptoms (GHQ4+) are at risk of having or developing a mental health disorder.

In 2013, the GHQ-12 was also administered by the Scientific Institute of Public Health in their national Health Interview Survey (HIS), which is periodically administered since 1997 in large representative samples of the general population in Belgium. An extensive description of the survey and its results can be found on the SIPH-website.

To answer our three research questions, we restricted our sample to all PhD students enrolled in a PhD study in Flanders (N=3659). The HIS-sample was restricted to the group of highly educated in the general population in Flanders (N=769). HIS-respondents were considered to be highly educated when they had successfully completed one or more educational programs in higher education outside university (3 to 5 year programs), or obtained an academic bachelor or master degree at a university. The HIS-sample also includes 14 PhD holders. Multi-group confirmatory

factor analyses showed that statistical analyses of the GHQ data across the SJR and HIS are valid from a psychometric point of view.

RISK OF MENTAL HEALTH DISORDER IN PHD STUDENTS

In Table 1, we present our findings on the first two research questions. The first two columns present the percentages, reflecting the prevalence of the twelve symptoms and the risk of a mental health disorder (GHQ4+) as observed in both samples. In the third column of Table 1, we present the adjusted risk ratio (RR), meaning that we statistically correct for different age and gender distributions across samples (e.g. respondents in the HIS are on average older). The risk ratio compares the prevalence in the sample of PhD students to the prevalence in the sample of the general highly educated population.

Table1. The prevalence of common mental health problems in PhD students (SJR) compared to the highly educated general population (HIS) in Flanders 2013: %, age and gender adjusted riskratio's.			
	SJR %	HIS %	Adj. RR ¹
Felt under constant strain	40.8	27.5	1.4
Unhappy and depressed	30.3	13.6	2.1
Lost sleep over worry	28.3	18.1	1.6
Could not overcome difficulties	26.1	12.0	2.4
Not enjoying day-to-day activities	25.4	13.1	2.2
Lost confidence in self	24.4	8.0	3.5
Not playing a useful role	22.5	9.2	2.3
Could not concentrate	21.7	10.7	1.9
Not feeling happy	21.2	11.1	2.2
Felt worthless	16.1	5.3	3.4
Could not make decisions	15.0	6.0	2.8
Could not face problems	13.4	4.3	3.7
Risk of a mental health disorder (GHQ4+)	31.8	14.0	2.4

¹ all RRs were significant at the $p < 0.001$ -level.

Column 1 of Table 1 shows that the prevalence of mental health problems in academia is high, ranging from 41% of PhD students reporting constant strain to 13% reporting the inability to face own problems. About 30% reports feeling unhappy and depressed whereas 28% reports sleeping problems due to worries. Roughly 1 in 4 to 1 in 5 PhD students experience inability to overcome difficulties, do not enjoy day-to-day activities, have lost confidence in themselves, feel they do not play a useful role, experience concentration problems, or do not feel happy. 16% feels worthless, 15% expresses inability to make decisions. Almost one third of the PhD students in Flanders are at risk of having or developing a mental health disorder.

Column 3 of Table 1 shows that PhD students experience significantly more mental health problems compared to the highly educated general population. The adjusted RRs vary from 1.4 (felt under constant strain) to 3.7 (could not face problems). Adjusted RRs of around 3 are also found for loss of confidence in self, feeling worthless and inability to make decisions. Adjusted RRs of 2.2 to 2.4 are found for the feeling

not to play a useful role, the inability to overcome difficulties, and the feeling not to enjoy day-to-day activities. Compared to the reference group in the population, twice as many PhD students report concentration problems and feelings of unhappiness and depression. The risk of having or developing a mental health disorder is 2.4 times higher for PhD students as compared to the reference group in the highly educated general population.

WORK ORGANIZATION, ORGANIZATIONAL POLICIES AND RISK OF MENTAL HEALTH DISORDER

Multivariate logistic regressions on the SJR-data suggest that work organization and organizational policies are associated with the prevalence of mental health disorders in PhD students. In Table 2, we present detailed findings on the association between several characteristics of the work and organizational context on the one hand, and risk of a mental health disorder on the other hand. The OR is a ratio describing (the strength of) the association between the presence or absence of experiencing at least 4 mental health problems (GHQ4+) and the (level of) presence or absence of another property (e.g. job demands).

Most notably, Table 2 shows significantly higher risks of a mental health disorder (so $OR > 1$): (1) in case of high job demands (such as work load, publication pressure), (2) for researchers on a scholarship or on project funding (compared to research assistants), (3) for researchers in teams with exclusively males or a large male majority (compared to gender balanced teams), (4) in case of a closed team decision-making culture, and (5) when job roles and family roles were conflicting. Sociodemographic findings indicated that (6) women are at higher risk.

Risks of a mental health disorder were significantly lower (so $OR < 1$): (1) in case of high levels of job control (meaning high levels of job variation, job autonomy and skill discretion), (2) when researchers were in the executive phase of their PhD track (compared to the start), and (3) when the PhD promoter adopted an inspirational leadership style. Risks were also significantly lower when: (4) the junior researcher expressed much interest in a future academic career, and (5) when he/she held a positive perception of the added value of a PhD on the non-academic labor market. Findings also showed (6) researchers with children had lower risks of having or developing a mental health disorder.

Finally, Table 2 shows that the risk of having or developing a mental health disorder does not differ between scientific disciplines nor between universities. The number of promoters involved, or gender of the (main) promoter does not play a role. Similarly, we found no association between risk of a mental health disorder and the perceived chance of a future academic career. Team conflict was not significantly

related. Neither were age or being in a relationship or being married.

DISCUSSION

This study is one of the first worldwide to provide accurate, evidence-based estimates of the prevalence of common mental health problems in PhD students, through benchmarking with the highly educated general population (thereby taking into account differences in gender and age distributions). By introducing an occupational health perspective, we assessed the predictive value of “classic” occupational stressors such as high job demands or low job control, but we also considered the association of mental health with characteristics specific to working at a university and pursuing a PhD.

When interpreting our findings, four specific points should be kept in mind. The first pertains to the limits of causal inference. The current study adopted a cross-sectional design allowing no causal conclusions. This means that our data cannot address the question whether working at a university is bad for one’s mental health (causation) or whether those choosing to pursue a PhD might have an a priori higher vulnerability for developing a common mental health problem, and more specifically a depression (selection). Such a self-selection interpretation would mean that individuals attracted to doing academic research are more likely to develop common mental health problems. Furthermore, given the statistically significant association with a number of work characteristics, these individuals would also be more likely to negatively evaluate their work environment. While such an interpretation of the findings would go against a well-established body of scientific research demonstrating that work stressors are causal determinants of mental health problems, we cannot exclude a reverse causality explanation. While there is some research documenting an empirical link between mental health problems and a preference for creative activities, future research is clearly needed to further delve into the underlying mechanisms.

The second limitation pertains to the generalizability of our findings. Our data pertain to all PhD students (with enrollment in a PhD study as inclusion criterion) across all scientific disciplines in all universities in Flanders. It could be that our findings are idiosyncratic to the Flemish academic landscape. However, as universities in Flanders have witnessed the same fundamental changes in the academic research industry in the past two decades as in most other OECD-countries, we believe our findings might be generalizable to all researchers pursuing their PhD degree in similar organizational and work contexts. Furthermore, the academic work environment is internationally oriented, with high mobility of researchers across countries. The extent to which our findings are generalizable to other countries is hard to determine without cross-country data. However, when comparing the

Flemish case to the international context, one should take into account that more than 9 out of 10 PhD students have a scholarship or an employment contract with a university, giving them a full monthly salary that is comparable or higher than most of their counterparts on the private job market. Studies in other countries have shown that financial worries and debts are one of the major stressors experienced by those pursuing a PhD. As financial worries and debts are not an issue for PhD students in Flanders due to competitive salaries, if anything, we would expect that the prevalence of mental health problems is even higher in those countries where PhD students have more financial difficulties.

A third issue to keep in mind concerns comparison of PhD students with other population groups. In the few existing studies on mental health that compare “groups in university” with “groups outside university”, the comparison group is usually a specific occupational group or the general population. In these studies, crucial basic gradients in health such as gender, age and education are not taken into account. As such the demonstrated and thus potentially confounding effects of these determinants of mental health are ignored. In our analyses we took into account gender, age and education. While different comparison groups may provide unique benchmarking information, each also have drawbacks.

A final point to be taken into account pertains to the measurement of mental health. Our study uses the GHQ-12 as it enables to study the risk of having or developing a mental health disorder (GHQ4+), especially depression. The GHQ4+ is a probabilistic measurement for caseness, urging for professional attention to the problems noted. Assessments of mental health problems based on scales such as the GHQ are useful in understanding various sources of distress, as well as predisposing factors, but it is recommended that results of such assessments are supplemented with other kinds of information on well-being such as sickness absence, presentism, poor productivity, or increased turnover.

Note. Full background, detailed information on methods and statistical analysis, and exploration of policy implications can be found in the full working paper cited below. As the paper is currently being reviewed by an international scientific journal, please check back with the authors for the latest version before citing. This pre-publication version of the paper was shared without the comfort blanket of peer review to adequately inform the public debate in a timely manner. *Levecque, K., Anseel, F., De Beuckelaer, A., Van der Heyden, J. & Gisle, L. (2015). Work organization and common mental health problems in academia: Alarming findings of a large-scale survey in Flemish universities. Working Paper.*

Table 2. Predictors of risk of a mental health disorder (GHQ4+) in PhD students, Flanders 2013 (N=3659): odds ratio (OR), 95% confidence intervals (95% CI), level of significance

	OR	95% CI	Sign
Constant	0.224		***
Work context			
Job demands	1.655	(1.293-2.118)	***
Job control	0.634	(0.500-0.804)	***
Scientific discipline			n.s.
Sciences (ref)	-	-	-
Biomedical sciences	0.842	(0.642-1.103)	n.s.
Applied sciences	0.988	(0.742-1.316)	n.s.
Humanities	0.930	(0.661-1.309)	n.s.
Social sciences	0.916	(0.692-1.211)	n.s.
Type of appointment			n.s.
Research assistant (ref)	-	-	-
Scholarship	1.431	(1.099-1.863)	**
Research project	1.378	(1.048-1.811)	*
No funding by university	1.229	(0.861-1.754)	n.s.
Other funding resources	1.266	(0.842-1.903)	n.s.
Don't know	1.380	(0.859-2.218)	n.s.
PhD phase			**
Initiating (ref)	-	-	-
Executing	0.671	(0.537-0.838)	***
Finishing	0.772	(0.585-1.018)	n.s.
Number of promoters			
One (ref)	-	-	-
None or more than one	1.013	(0.849-1.208)	n.s.
Gender of (main) promoter			
Male (ref)	-	-	-
Female	1.022	(0.825-1.266)	n.s.
Leadership style: inspirational	0.911	(0.835-0.994)	*
Leadership style: autocratic	0.925	(0.851-1.005)	n.s.
Leadership style: laissez-faire	1.046	(0.973-1.123)	n.s.
Much interest in an academic career	0.783	(0.655-0.935)	**
Perception of high chance of an academic career	1.022	(0.855-1.221)	n.s.
Positive perception of career outside academia	0.791	(0.707-0.884)	***
Organizational context			
University			n.s.
KU Leuven (ref)	-	-	-
Ghent University	0.925	(0.755-1.133)	n.s.
Antwerp University	0.989	(0.749-1.306)	n.s.
Free University Brussels	1.005	(0.755-1.337)	n.s.
Hasselt University	1.126	(0.755-1.678)	n.s.
Team gender composition			***
Balanced gender composition (ref)	-	-	-
Only males, or large majority is male	1.474	(1.201-1.810)	***
Only females, or large majority is female	1.254	(0.975-1.615)	n.s.
Team conflict	1.059	(0.933-1.202)	n.s.
Closed team decision-making	1.205	(1.081-1.345)	**
Family work conflict	1.310	(1.174-1.463)	***
Work family conflict	1.515	(1.347-1.705)	***
Sociodemographics			
Female	1.371	(1.093-1.586)	**
Age	1.002	(0.978-1.027)	n.s.
Partner	0.865	(0.713-1.049)	n.s.
Children	0.647	(0.481-0.870)	**
Model fit GHQ4+:			
LR = 485.667 df = 35 p<0.001 Nagelkerke R ² = 0.209			

ref=reference category n.s.=not significant

*=p<0.05 **=p<0.01 ***=p<0.001