



ELEPHANT

IN THE LAB

CROSSPOST

Addressing the mental health crisis among doctoral researchers

Short title	Addressing the mental health crisis among doctoral researchers.
Long title	Mental health risks among higher education students and doctoral researchers
Authors	Yorick Peterse ¹ , Jana Lasser ² , Giulia Caglio ³ , Katarzyna Stoltmann ⁴ , Dagmara Rusiecka ⁵ and Martin Schmidt ⁶
Author affiliation	¹ Max Planck Institute of Psychiatry, Germany ² Max Planck Institute for Dynamics and Self-Organisation, Germany ³ Max Delbrück Centre for Molecular Medicine, Germany ⁴ Leibniz-Center General Linguistics, Germany ⁵ GEOMAR – Helmholtz Centre for Ocean Research, Germany ⁶ Leibniz Centre for Agricultural Landscape Research, Germany
Author bios	<p>Yorick Peterse studied biomedical sciences and psychology and is currently finishing his doctoral degree in translational psychiatry / human biology.</p> <p>Jana Lasser is a physicist and does her PhD on pattern formation in salt deserts at the Max Planck Institute for Dynamics and Self-Organisation in Göttingen. She has been active in PhD representation for four years and is Spokesperson of the Max Planck PhDnet.</p> <p>Giulia Caglio joined the Max Delbrück Centre for Molecular Medicine (Germany) with the international PhD program. She was elected as PhD representative and was speaker of the Helmholtz Juniors.</p> <p>Katarzyna Stoltmann has been working as a doctoral researcher at the Leibniz-Center General Linguistics (ZAS) since September 2015. Later she became a spokesperson of the Leibniz PhD Network and Board Member of the N² (Network of Networks) representing interests of doctoral researchers within the Leibniz Association and beyond.</p> <p>Dagmara Rusiecka completed a PhD in chemical oceanography at the National Oceanography Centre in Southampton (UK) and GEOMAR in Kiel (Germany). Apart from that, she is a PhD representative and speaker of the Helmholtz Juniors.</p> <p>Martin Schmidt is an Associate Researcher at the Alexander von Humboldt Institute for Internet and Society (Germany). He is an agricultural and soil scientist by training. Currently, he does his PhD in environmental modelling at the University of Potsdam (Germany).</p>
Date published	4 September 2018
DOI	10.5281/zenodo.1402423
Cite as (APA)	Peterse, Y., Lasser, J., Caglio, G., Stoltmann, K., Rusiecka D., Schmidt, M. (2018). Addressing the mental health crisis among doctoral researchers, part I. <i>Elephant in the Lab</i> . DOI: https://doi.org/10.5281/zenodo.1402423



ELEPHANT

IN THE LAB

CROSSPOST

Mental health issues

Statistically, [one in three](#) people will suffer from a mental health disorder at some point in their life. This usually concerns stress-related disorders, such as mood and anxiety disorders, which are among the [most debilitating illnesses](#), meaning they are associated with a severely reduced professional and social capacity. This automatically leads to a high economic burden. For example, the direct and indirect costs of mental health disorders were estimated to be [418 billion euro in Europe in 2010](#). Importantly, psychiatric illnesses like depression and anxiety disorders are only diagnosed when a person suffers from a certain number of symptoms of psychological distress, for a minimum duration of usually some months. This inevitably leads to an arbitrary line between healthy and diseased, and indeed, persons suffering from fewer symptoms or for shorter periods can still be impaired in their daily activities, and have a higher probability of developing [more severe psychological problems at a later point in time](#).

Mental health among higher education students and doctoral researchers

It is known that certain societal subgroups are at higher risk for experiencing psychological distress than others. For instance, persons belonging to a minority group (based on ethnicity, sexual orientation, gender identity, religion etc.), to a lower socio-economic status group, or to certain professional groups [more often suffer from mental health issues](#).

One of the professional groups that is at particularly increased risk for developing mental health issues is doctoral researchers, and actually this risk is already increased for higher education students. [Beiter et al. \(2015\)](#) showed that undergraduate students suffered from severe to extremely severe levels of stress (11%), symptoms of depression (11%) and symptoms of anxiety (15%). [Evans and colleagues \(2018\)](#) focussed on [U.S. graduate students](#) (of which 90% were doctoral researchers) and found moderate to severe rates of anxiety (41%) and depression (39%), which were more than six times as high as the rates in the general population (6% for both anxiety and depression). Additionally, students that were female, gender non-conforming, or that had a strained relationship with their mentor were found to be disproportionately affected. According to a recent [Nature Graduate Survey](#), more than 25% of doctoral researchers were concerned about their mental health, and 12% sought professional assistance. Another [study conducted specifically among doctoral researchers](#) found that 51% experienced psychological distress, and 32% experienced so many symptoms that they were at high risk for having or developing mental health disorders. This study also compared doctoral researchers to three control groups: higher education students (which included PhDs), highly educated persons in the



ELEPHANT

IN THE LAB

CROSSPOST

general population and highly educated employees. Doctoral researchers were found to be respectively 1.85, 2.43 and 2.84 times at higher risk for having or developing a psychiatric disorder.

Apparently, people that conduct a PhD are exposed to specific factors that increase the risk for developing mental health issues, in comparison with people with a similar educational background. In fact, the percentage of doctoral researchers at high risk for having or developing a psychiatric disorder almost equals the *lifetime* prevalence of psychiatric disorders in the general population, even though a PhD only takes some years. Some of the possible risk factors identified in the abovementioned studies include work-life and life-work balance, financial issues and funding opportunities, job demands and job control, perception of career perspectives, and the relationship with the supervisor and influence on decision making.

Mental health among doctoral researchers of the German N2 Network

Knowledge of the economic impact of mental health issues has led to increased attention for mental health on the work floor and for initiatives to improve conditions in this area in recent years. This has also been the case in academia, including in the German doctoral researcher associations of the N2Network: the [Helmholtz Juniors \(HeJu\)](#), the [Leibniz PhD Network](#) and the [Max Planck PhDnet \(PhDnet\)](#).

To examine whether work-related psychological distress is also an issue among their members, the HeJu and the PhDnet conducted surveys in 2017, which also covered mental health-related questions.

The [Max Planck PhDnet survey](#) asked their members to identify whether they suffered from one of six stress-related symptoms during their PhD: depression, burnout, eating disorder, chronic fatigue, sleeplessness and migraines. From the 2218 respondents of the survey, 53% reported at least one symptom, 31% reported two or more symptoms and 16% reported having suffered or suffering from three or more symptoms. Of the respondents reporting to suffer from any symptom, 65% thought that the stress was directly connected to their PhD project. Stress symptoms tended to be more prevalent among female, international and doctoral researchers that are older or are in the late stages of their project. Moreover there was a strong correlation between being dissatisfied with PhD supervision and suffering from symptoms of stress. Interestingly, there was a large discrepancy between self-reported and diagnosed symptoms:



ELEPHANT

IN THE LAB

CROSSPOST

only 6% of respondents indicated that they had been diagnosed with a mental health disorder during their PhD. This could be an indication that mental health issues are still a taboo and people do not feel comfortable seeking help, or that they do not have access to the appropriate resources.

The [Helmholtz Juniors survey](#) focused on job satisfaction and supervision, as these were identified as pivotal factors in previous surveys. In general, doctoral researchers were satisfied (45%) to very satisfied (25%) with their doctoral research, as well as with their project (45% satisfied, 20% very satisfied). However, when asked about mental well-being, a substantial proportion of respondents reported not to be able to handle the workload (20%), not to be able to work on the PhD (>60%), or not to be able to cope with the tasks (40%). Moreover, a relatively large proportion of participants indicated they were not satisfied with their work-life balance (<60%), with no significant differences between subgroups (gender, nationality, etc). Doctoral researchers of the HeJu devoted more than 41.5 hours per week (>60%) to their research, which is more than their contractually obligated hours, and some reported to feel pressure from their supervisors to work more, including during free time, weekends, and vacation. Almost 40% of doctoral researchers at the Helmholtz Association considered resigning from their PhD, with supervision (>60%) and workload (25%) mentioned as the main reasons.

The important role of workload was also identified in the PhDnet survey. Participants of that survey worked an average of 47 hours per week and 81% of them worked more than their contractually obligated hours. Seventy five percent of doctoral researchers worked at least one weekend per month and 20% of them did not feel free to take their contractually granted holidays due to supervisor pressure or high workload. Nevertheless, satisfaction levels were high, with 75% of doctoral researchers reporting to be either “satisfied” or “very satisfied” with their doctoral research and working conditions.

Both surveys indicate that supervision is an important factor for the satisfaction of doctoral researchers, and the PhDnet results indicate that this is linked to their mental well-being. Additionally, workload has an important impact, which takes its toll on the satisfaction and well-being of early career researchers. A final aspect revealed by the HeJu survey is contract duration, which is often shorter than the actual duration of the PhD project. Forty percent of the participants reported to have 2-3 years of financial support, even though the average PhD project lasted 3.5 years.

Having identified mental health as an important factor in work conditions for early career researchers, we propose several measures that can be implemented to improve the situation. These will be discussed in the [upcoming blog post](#).



ELEPHANT

IN THE LAB

CROSSPOST

All authors performed or are currently performing research at one of the German scientific societies, and are or were official representatives for the doctoral researchers of those societies. Yorick Peterse and Jana Lasser are affiliated with the [Max Planck PhDnet](#), Giulia Caglio and Dagmara Rusiecka with the [Helmholtz Juniors](#), and Katarzyna Stoltmann and Martin Schmidt with the [Leibniz PhD Network](#). Together they form the [N2 Network of Doctoral Researchers](#). Yorick Peterse, the main author, studied biomedical sciences and psychology and is currently finishing his doctoral degree in human biology / translational psychiatry. You can find him on <https://www.linkedin.com/in/yorickpeterse/>

Suggestions to improve mental health of doctoral researchers

Based on our experience, the survey data described in our [previous blog post](#) addressing this issue and on the earlier mentioned studies, we suggest six fields of action that can be addressed by academic institutions to improve mental health of doctoral researchers:

- Supervision and leadership
- Financial and job security
- Work demands and work-life balance
- Career development
- Administrative and material support
- Social environment.

1. Supervision and leadership

As mentioned in some of the studies described before and in the results from our own surveys, the relationship with the supervisor and the way a research project is managed is a fundamental aspect of a successful PhD. An involved supervisor, a concrete and realistic research and time plan, as well as alternative plans in case experiments do not lead to publishable results, provide security for doctoral researchers. On an administrative level, this can be implemented with the following measures:

- A mandatory PhD project plan, including a realistic timeline.
- Mandatory regular status meetings.
- Implementation of Thesis Advisory Committees that receive regular (at least yearly) progress reports, mediate in case of conflict with the supervisor and advise on scientific questions.
- Limiting the number of doctoral researchers per supervisor.
- Leadership training for new mentors. This would ensure that they do not just have the necessary academic knowledge, but also the management skills to supervise



ELEPHANT

IN THE LAB

CROSSPOST

doctoral researchers. These trainings are already implemented in cutting edge higher education institutions.

- Monitoring the performance of PhD supervisors. This would make it easier for prospective doctoral researchers [to select an appropriate supervisor](#), and it would allow supervisors to improve themselves.

2. Financial security and job security

The financial security aspect of doing a PhD does not just entail receiving fair payment, but also having the certainty of being funded until the PhD project is completed. Continuous accumulation of temporary contracts results in stress, anxiety and worry about whether a project can, or has to, be finished in the next couple of months. It makes it difficult to plan other life aspects, such as the foundation of a family or the transition to a new career. An option to create more security would be making the awarding of a doctoral title dependent on delivering pre-determined goals (e.g. a certain number of publications), combined with providing a financial incentive for institutes to supervise a doctoral researcher towards the successful completion of the PhD. This would bind finishing a PhD to the financial situation of the academic institution, and would thereby align the interests of doctoral researchers and their supervisors.

3. Work demands and work-life balance

High work demands in academia are probably hard to reduce, although a realistic time plan as mentioned in the supervision and leadership section would be a good start. Additionally, stress-alleviating measures, such as regular breaks at work and stress-relief courses provided by institutes, should be available to all researchers.

Work-life balance initiatives and/or coaching for both PhD researchers and supervisors would help academics at all levels. Additionally, institutions should encourage employees to take available holidays and discourage work on weekends and public holidays. Moreover, work-family support-structures, such as day-care at an institute, financial support for families, the possibility to work remotely and/or part-time, and a contract that provides security that a PhD can be completed successfully, should be a standard.

4. Career development

The study by [Levecque and colleagues](#) found that doctoral researchers that did not have a positive perception of finding a career outside of science were more likely to experience mental health issues. [Since 9 out of 10 doctoral researchers will not continue to work in academia](#), improved counselling about alternative career paths would provide a better sense of job security



ELEPHANT

IN THE LAB

CROSSPOST

for after the PhD. Further, there should be cultural change in academia towards an open and positive communication about career options. A career outside academia should be the new standard in career development and the negative connotations linked with it should be avoided.

5. Administrative and material support

Administrative and material support foremostly means that sufficient resources are available to conduct the PhD research project. Additionally, some of the abovementioned measures would go a long way in making the work environment for early career researchers healthier. It could also lead to an increased efficiency by reducing the number of aborted projects and days lost due to sick leave.

Major improvements could be made by including mental health in the institutional health check-ups, providing free psychological support and coaching, and by training researchers at all levels how to recognize symptoms of psychological distress in their own thoughts and behaviour, as well as in that of others. An online guide on where to find psychological assistance (also in foreign languages) would make it easier for researchers to quickly find help when needed.

Particular attention should be given to minority groups. It should be ensured that people feel free to be themselves, as well as to report any potential cases of discrimination. Stress experienced by coming from a foreign country and not mastering the local language or being familiar with local customs could be alleviated by providing more guidance in these aspects.

6. Social environment

Finally, social environment plays an important role in mental health, in which we also include the way people communicate about psychological issues. First of all, doctoral researchers would benefit professionally and socially from contact with colleagues and with more experienced researchers in settings like peer groups or regular social events. Especially for foreign researchers, who often lose their social support structures such as family and friends when moving abroad, social activities would be beneficial to help build a new social infrastructure.

Moreover, there is a taboo about addressing mental health issues to colleagues. A study by the British charity [Time To Change](#) found that only 13% of respondents would open up about mental health illness at work, versus 36% about physical health matters. Importantly, since scientific peers are exposed to the same type of stressors, it can be common to normalize symptoms of psychological distress, for example a lack of sleep or stress for submission deadlines. For this reason, awareness initiatives are crucial in increasing knowledge about how common mental



ELEPHANT

IN THE LAB

CROSSPOST

health problems are, to communicate more openly about them, to stop normalization of symptoms of psychological distress, and to promote healthy behaviour at work.

Influence on policy

Of the solutions mentioned above, some have already been implemented by the different German scientific societies. For instance Thesis Advisory Committees and a PhD supervision agreement are encouraged by all scientific societies. Financial support for families, child day-care at the institute, stress-relief courses and administrative support for foreign nationals are available at individual institutes. Additionally, all societies require the election of an officer for the equal treatment of women, and stimulate the advancement of women into more senior research positions. Finally, most institutes organize social events at least a couple of times a year, and often institutes within the same region or with similar research disciplines organize joint events.

Further influence on mental health-related policy is actively being pursued by the three PhD associations. The Helmholtz Juniors (HeJu) together with the Helmholtz Association promote the implementation of PhD Committees and Supervision Agreements in every institute and monitor the effectiveness of these measures. Moreover, the Helmholtz Association is part of a training project for supervisors, which is organized together with the [Karolinska institute](#). Some individual Helmholtz centres have career advisors and fairs, which are further promoted via the HeJu network and the [NextGen@Helmholtz](#) conference, which also provides scientific training and alumni networking. HeJu were also involved in writing the Helmholtz PostDoc guidelines, which put strong emphasis on supervision training and support. They further contribute to the formation of a Helmholtz postdoc network, which could work closely with the HeJu on common goals such as the improvement of mental-health related work conditions in academia.

Members of the Steering Group of the Max Planck PhDnet have been invited to join the ‘institutional health management’ workgroup of the General Administration of the Max Planck Society (MPS) since 2017. The working group has identified mental health issues as the biggest concern for “knowledge workers”. Max Planck is currently running a pilot workshop “*strong and positive during the doctorate*” as well as a seminar for “*mental health at top performance*”. Both measures experience very high demand from doctoral researchers and will be evaluated and be made accessible for a larger group of people including PostDocs if successful. These measures are organized and promoted under the umbrella of PhDnet and the graduate schools. In addition, mental health risks are becoming part of the general workplace health risk assessment. If certain groups of employees show higher prevalence of stress symptoms, institutes are asked to implement their own stress reduction measures in collaboration with the health insurances.



ELEPHANT

IN THE LAB

CROSSPOST

Finally, PhDnet organizes an annual career event, and works together with the [Max Planck Alumni Association](#), to provide mentoring and career counselling.

Conclusion

Survey data of the German doctoral researcher networks show that early career researchers face significant mental health issues, which is in line with research on larger samples of international doctoral researchers. Therefore, we highly recommend implementing measures to improve mental health-related work conditions for PhDs and other researchers.

PhD representatives should be involved in the process of designing prevention measures, both at the organizational level as well as with the implementation of these measures on an institutional level. In this blog post, we proposed concrete measures in six categories: supervision and leadership, financial and job security, work demands and work-life balance, career development, administrative and material support and social environment.

Although most of the German research societies already implemented some of the suggested measures, further prevention of the occurrence of mental health issues could be obtained by implementing the remaining suggestions. Hopefully this would lead to a reduction of mental health issues among (future) researchers, and to an improved availability of help for doctoral researchers who have already developed mental issues.

All authors performed or are currently performing research at one of the German scientific societies, and are or were official representatives for the doctoral researchers of those societies. Yorick Peterse and Jana Lasser are affiliated with the [Max Planck PhDnet](#), Giulia Caglio and Dagmara Rusiecka with the [Helmholtz Juniors](#), and Katarzyna Stoltmann and Martin Schmidt with the [Leibniz PhD Network](#). Together they form the [N2 Network of Doctoral Researchers](#). Yorick Peterse, the main author, studied biomedical sciences and psychology and is currently finishing his doctoral degree in human biology / translational psychiatry. You can find him on <https://www.linkedin.com/in/yorickpeterse/>

References

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. *Journal of Affective Disorders*, 173, 90–96. [Link](#)

Evans, T. M., Bira, L., Gastelum, J. B., Weiss, L. T., & Vanderford, N. L. (2018). Evidence for a mental health crisis in graduate education. *Nature Biotechnology*, 36(3), 282–284. [Link](#)



ELEPHANT

IN THE LAB

CROSSPOST

Fergusson, D. M., Horwood, L. J., Ridder, E. M., & Beautrais David M. (2005). Subthreshold Depression in Adolescence and Mental Health Outcomes in Adulthood. *Archives of General Psychiatry*, 62(1), 66–72. [Link](#)

Helmholtz Juniors. PhD survey 2017 – 2nd edition. 2018. [report] [Link](#)

Kessler, R. C., Angermeyer, M., Anthony, J. C., DE Graaf, R., Demyttenaere, K., Gasquet, I., ... Ustün, T. B. (2005). Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)*, 6(3), 168–176. [Link](#)

Levecque, K., Anseel, F., De Beuckelaer, A., Van der Heyden, J., & Gisle, L. (2017). Work organization and mental health problems in PhD students. *Research Policy*, 46(4), 868–879. [Link](#)

Max Planck PhDnet. 2017 PhDnet survey report. 2018. [report] [Link](#)

Barres, B. A. (2013). How to pick a graduate advisor. *Neuron*, 80(2), 275–279. [Link](#)

Cannon, L. (2016, September 15). How many PhD graduates become professors? [blog post] [Link](#)

Levecque, K., Anseel, F., De Beuckelaer, A., Van der Heyden, J., & Gisle, L. (2017). Work organization and mental health problems in PhD students. *Research Policy*, 46(4), 868–879. [Link](#)

Olesen, J., Gustavsson, A., Svensson, M., Wittchen, H. U., & Jönsson, B. (2012). The economic cost of brain disorders in Europe. *European Journal of Neurology*, 19(1), 155–162. [Link](#)

World Health Organization. The global burden of disease – 2004 update (2004). [report]. Geneva, Switzerland, WHO.

World Health Organization. Risks to Mental Health: An Overview of Vulnerabilities and Risk Factors. (2012). [report]. Geneva, Switzerland, WHO.

Woolston, C. (2017). Graduate Survey: A Love-Hurt Relationship. *Nature*, 550(7677), 549. [Link](#)