

Supervision satisfaction survey of PhD students at the University of Cologne in the MNF with a focus on chemistry students

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Abstract

The aim of this study is to examine for the very first time the mental health and general satisfaction of doctoral students during their doctorate at the University of Cologne (UoC) at the Faculty of Mathematics and Natural Sciences MNF (N=216). The objective of this study is to classify doctoral students in the field of chemistry (N=49) in relation to the entire faculty. The results of the 12-item General Health Questions (GHQ) indicated that 52% of the doctoral students surveyed were at a risk of having or developing a common psychiatric disorder. PhD students in chemistry reported lower levels of happiness than those in the MNF as a whole. Financial concerns, the quality of supervision, and the workload were identified to correlate with the mental health problems.

Keywords: Mental health, GHQ12, doctoral students, work organization

Introduction

„die Studierendenbefragung in Deutschland“ is a social survey and provides information on the living and study situation as well as the economic and social situation of students throughout Germany. The latest available data was collected in the summer semester of 2021 and is based on the responses of 188,000 students. Participants included German and international students, as well as students at private universities and distance learners. Some of the key findings of the study include that 42% of students feel exhausted by their studies (41% rarely or never feel this way). The amount of time spent studying is about 34 hours per week. In addition, it was found that around 65% of students are in gainful employment, with 68.3% of students from non-academic households (50.1% from academic households) working to finance their living expenses. The total monthly expenditure of the students was around 1,100 euros, with 77% of the students stating that their living expenses were covered, although this was not the case for 10.6%. A high need for consulting was also identified, although only 48% of the students surveyed with a need for advice used at least one advice service. (BMBF, 2021)

This type of study provides a representative picture of the student situation, yet affords individual universities minimal opportunity to identify problems within their institution. Moreover, doctoral students are not recorded or named as a discrete group, thus precluding the collection of separate information on their situation.

In 2019, the first study was conducted in Germany that explicitly addressed the conditions of doctoral candidates and compared their general living conditions with those of doctoral graduates. This study, entitled *Nacaps* (National Academics Panel Study), was conducted by the German Center for Higher Education Research and Science Studies (Deutsches Zentrum für Hochschul- und Wissenschaftsforschung, DZHW) in cooperation with 65 German universities entitled to award doctorates. (DZHW, 2020) Nevertheless, the *Nacaps* study does not permit any conclusions to be drawn about the doctoral conditions at individual universities or faculties.

In 2017, a study on the mental health of doctoral students was published, preceded by a survey in 2013. *Levecque et al.* (2017) conducted a survey of Belgian doctoral students (1) from various universities, pursuing their doctoral studies in different faculties. The PhD students situation was compared with three other groups in the population: (2) a highly educated general population, (3) highly educated employees, and (4) highly educated students. Based on their results of the 12 comprehensive mental health symptoms, it was found that almost 32% of the doctoral students were at a risk of having or developing a common psychiatric disorder, particularly depression. In the comparison groups, this finding was much lower, 14% for (2), 12% for (3), 14% for (4). In addition, *Levecque et al.* found that the organizational framework of the doctoral program in particular was associated with psychological problems. The workload, the supervisor's management style, the decision-making culture in the team, and thoughts of a career outside academia were also mentioned. (Levecque et al., 2017)

In 2021, doctoral student representatives from the Department of Biology (GSfBS) at the University of Cologne conducted a study on doctoral students' satisfaction with supervision and their graduate school. The results, which are not publicly available, indicated that the emotional status of doctoral students declines over the time of their doctoral studies, the workload is perceived as insufficient in relation to remuneration, and 10-20% of the survey participants reported experiences of bullying. (Representatives, 2022) However, there has never been a faculty-wide survey of this kind, and to our knowledge, there has also never been a survey of PhD students in the Department of Chemistry.

This study thus explicitly addresses the study situation and the general life situation of doctoral students at the Faculty of Mathematics and Natural Sciences at the University of Cologne. Particular attention is devoted to doctoral students of chemistry and biochemistry, henceforth collectively referred to as "chemistry," whose responses are contrasted with those of the entire faculty. This study is intended to establish correlations between the general state of mental health and the financial situation, supervision, interaction within the faculty and satisfaction with teaching.

Method

This survey was created, conducted, and analyzed by the MNF doctoral representatives. The survey was designed to the best of our knowledge. The aim was to obtain an overview of the mental health and overall satisfaction of doctoral students at MNF, to identify areas of concern within the faculty (or departments), and to confirm or quantify hypotheses and visualize them (statistically). Since the survey was directed from doctoral students to doctoral students, a high response rate with honest feedback was hoped for.

The data examined in this study were collected as part of an online survey. The online survey tool used was *LimeSurvey*, and the study was conducted in English. It should be noted that the survey also included questions of a sensitive nature. Accordingly, it was advised that the study be conducted in a calm and private setting. The invitation to participate was distributed to the doctoral students by the heads of the graduate schools (on behalf of the doctoral representatives/study administrators) via the corresponding email distribution lists of the graduate schools, accompanied by a brief explanatory text outlining the details of the planned study. The initial invitation to participate in the study was extended on March 18, 2024, with a subsequent invitation sent on April 3, 2024. A final reminder was sent on April 16, 2024, and the study was closed on April 21, 2024. The study could be carried out by the addressees at any time and could be terminated at any time and subsequently resumed at a later date, on the condition that cookies were accepted.

The invitation to participate in this study was sent to all doctoral students enrolled in the graduate schools (GSGS - Graduate School of Geoscience; GSfBS - Graduate School for Biological Science; BCGS - Bonn-Cologne Graduate School of Physics and Astronomy; GraMatIK - Graduate School of Mathematics/Computer Science; CGSC - Cologne Graduate School Chemistry), resulting in a total of 1,094 doctoral students (status in 2023). The questions were the same regardless of the graduate school, only the questions specific to each graduate school differed. A response rate of 19.7% was achieved among all PhD students, resulting in a total number of N=216 participants who completed the survey in full (composition: GSGS 18.3%; GSfBS 32.9%; BCGS 13.1%; GraMatIK 7.3%; CGSC - 28.4%). All others (incomplete survey N = 108) were excluded from the average. The CGSC has 207 members (as of May 24), of which 49 (24%) completed the survey.

The gender breakdown of all survey respondents was 46% male, 49.1% female, 3.5% not specified, 1.4% diverse, while the gender breakdown of CGSC survey respondents was 52.4% male, 41.5% female, 6.1% not specified, 0% diverse. The majority of MNF doctoral students, 44.6%, received their highest academic degree at the University of Cologne, and 63.8% of doctoral students in chemistry. In addition, 28.9% (28.8%) of MNF doctoral students (CGSC) stated that they had obtained their highest academic degree at another university in Germany, 11.8% (3.8%) at a university in Europe and 14.6% (3.8%) outside the EU. The average age of all doctoral students across all years is 28.8 years.

A variety of response format scales were employed in this survey, including the options "Yes," "No," "Strongly Disagree," "Somewhat Disagree," "Somewhat Agree," "Strongly Agree," and "Strongly Disagree," "Disagree," "Neutral," "Agree," and "Strongly Agree." Specific figures were also requested, e.g. including net monthly salary and age. For each question, respondents were given the option to abstain or to confirm with "No Answer." In each topic section, respondents were also invited to provide individual experiences or suggestions in a free text box. At the beginning of the survey, respondents were asked to assess their general state of mental health comprehensively across twelve symptoms via the "General Health Questions" (GHQ12).

The GHQ is a standardized tool utilized globally to objectively classify the mental health of a target group. The instrument is primarily designed to assess psychological disorders and depression. The results of the GHQ questions could be compared with published data from surveys of doctoral students in Belgium and in similar studies in Australia and the United Kingdom [(Boyd et al., 2011; Goodwin et al., 2013)]

A cutoff value, defined as the minimum number of symptoms that an individual must report, is established to indicate the presence of mental disorders. A score of GHQ2+ requires the presence of at least two symptoms and is indicative of mental distress. GHQ3+ requires three symptoms, GHQ4+ four symptoms, indicating a risk of having or developing a common psychiatric disorder. (Goldberg et al., 1997) The symptoms are quantified adapting the 4-point Likert scale, with a 0-0-1-1 counting method. The resulting GHQ score was then correlated with topics related to doctoral studies, including financial situation, supervision, teaching, colleagues, and job circumstances.

The responses obtained from the survey were imported from the survey tool *limeSurvey* as a CSV file in *Excel*. The responses were then collected using the `=CALCULATE` command and plotted on *Origin* to obtain the evaluation on a percentage scale. In the case that the questions pertained to specific numerical values, *Origin* was used to generate a box plot that identifies outliers (symbol: filled diamond) in accordance with the 1.5 IQR rule and excludes them from consideration. The responses within the 25-75% range are illustrated in the box, and the mean value (symbol: line) and median (symbol: not filled dot) are also displayed.

Results and Discussion

The initial step is to evaluate the results of the study concerning the mental health of doctoral students. This was to be achieved by utilizing the 12 GHQ symptoms. The results of the GHQ12 survey are summarized in Table 1 and compared with those from the study by *Levecque et al.* with experimental group (1) and (3). It is notable that a significantly higher proportion of participants in our study (77%) indicated signs of psychological stress (GHQ2+) compared to the doctoral students surveyed in Belgium (1) (51%) and the general population (32%). This trend was also evident in the GHQ3+ and GHQ4+ scores. (*Levecque et al., 2017*) The *Nacaps* study also reported that doctoral students (64%) indicated more days with physical or mental

impairment than doctoral graduates (40%), with the phases lasting longer in comparison. These comparatively high figures at the MNF may be associated with the particular stress experienced during the doctorate. (Kolja Briedis, 2020)

Table 1: This overview compares the GHQ scores with the data collected in the study by Levecque et al.) of doctoral students in Belgium (1), a highly educated general population (3), (Levecque et al., 2017) and doctoral students at the University of Cologne in the Faculty of Mathematics and Natural Sciences.

GHQ Score	Levecque et al. (3) highly educated general population 2013 N=769	Levecque et al. (1) doctoral students 2013 N=3659	Diese Studie MNF doctoral students UzK 2024 N=215
GHQ2+	27%	51%	77%
GHQ3+	18%	40%	66%
GHQ4+	14%	32%	52%

The last question of the GHQ was "Do you feel reasonably happy considering all the circumstances?". The survey participants who show this symptom [in %] are plotted against the years in the doctorate they are in, see Figure 1. In general, it can be seen that doctoral students' own assessment of their happiness in the MNF as a whole and in chemistry decreases as the number of years in the doctorate increases. A decline in the trend is evident in the fourth year, which may be attributed to the fact that a considerable number of doctoral students complete their doctoral studies between the third and fourth year. It was found that, particularly after the end of the second year, doctoral students in chemistry report a greater prevalence of unhappiness than doctoral students in the MNF as a whole. Over half of the doctoral students in chemistry (66.7%) indicated that they were not experiencing a reasonable level of happiness upon reaching at least the fifth year of their doctoral studies.

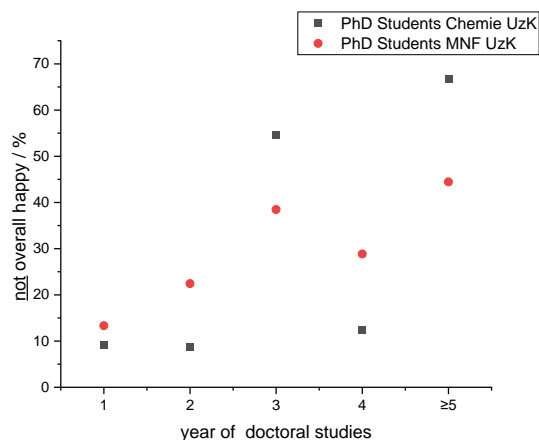


Figure 1: Presentation of doctoral students at the UoC in the entire MN Faculty and Chemistry who state that they are not reasonably happy plotted against the year of the doctorate.

With regard to the **financial situation** of the respondents, they were requested to provide their net monthly income, which was supposed to be rounded to the nearest hundred. The mean monthly income of doctoral students in the MNF was reported to be €1,993. The mean income of doctoral students in chemistry was approximately €150 less (€1826) than that of the entire faculty, as illustrated in Figure 2a. The *Nacaps* study revealed that the mean net income of doctoral students in Germany in 2019 was €1841 (Wegner, 2020) , which is also higher than the income of chemistry doctoral students in 2024. It is also important to note that there are significant fluctuations in income levels, with some individuals earning between €1,000 and €3,000 per month. This is particularly evident in the MNF, but also within the CGSC, despite the fact that these individuals are engaged in the same profession and work similar hours per week. In comparison, full-time employees (40 h) on minimum wage currently earn €2151 gross (BMAS, July 2024), which corresponds to a net salary of approximately €1560 (STK.1, 15.5% health insurance). (BMAS, Juli 2024) As the survey does not differentiate between the respective CGSC institutes or working groups, a more precise analysis of salary differences is not possible at this time. Conversely, the discrepancy between the actual number of working hours (44.0 h/week) and the number of working hours agreed upon in the contract (25.1 h/week) is more significant for doctoral students in chemistry ($\Delta 18.9$ h/week) than for doctoral students in the MNF as a whole (contractual: 28.3 h/week, actual 25.1 h/week; $\Delta 3.2$ h/week). It can therefore be concluded that doctoral students in chemistry are employed for fewer hours per week and therefore have a lower income on average, but their actual working hours are higher than those of doctoral students in the MNF as a whole.

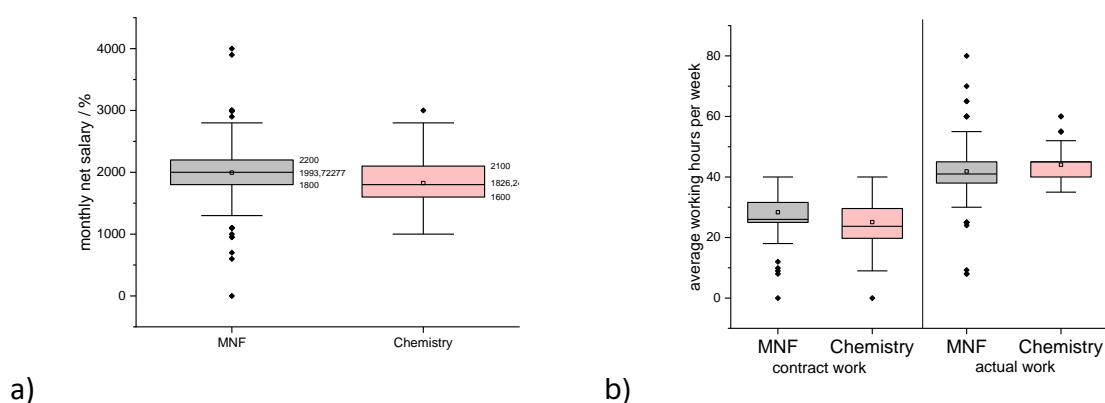


Figure 2: a) Net monthly income in euros (€) of doctoral students at MNF and Chemistry. b) Contractually agreed weekly working hours and actual weekly working hours of doctoral students at MNF and Chemistry.

A majority (53%) of MNF doctoral students indicate that their remuneration is inadequate in relation to the responsibilities and qualifications they bring to the role. Additionally, nearly 50% of doctoral students are concerned about their financial situation. 9.3% of these students reported having to take on a second job or being dependent on the support of third parties, while 6% stated that they were unable to cover their monthly living costs. As part of their doctoral studies, many students are offered a proportionate TVL-13 position, which typically ranges from 50-66%. (*Nacaps*: 62%; (Lara Berroth, 2022)). In contrast, actual working hours are expected to correspond to full-time employment. 43% of chemistry PhD students say that

they feel forced to work overtime, not least because of regular meetings with their supervisor. This seems to correlate with the GHQ score, with a correlation coefficient of 0.58 when asked whether the doctorate is a constant source of stress.

19% of the chemistry PhD students reported that they were not satisfied with their **supervisor**, as indicated by a correlation coefficient of -0.52 with the GHQ scores could be related to mental health. In addition, 22% reported feeling pressured by their supervisor, but 54% did not. 11% of the chemistry PhD students reported that the supervisor abused his or her position of power, compared to 82% who did not report this and 8% abstained. These results show that the way the supervisor, usually a professor, treats doctoral students could play a crucial role in their psychological or professional satisfaction, as suggested by other studies. (Levecque et al., 2017)

In addition, the PhD students (Chemistry) were asked to indicate how often they meet with their supervisor for a professional discussion and how they perceive this meeting frequency. From a meeting frequency of 2-3 times per month, some PhD students (30%) felt that this frequency was too low. If the meeting frequency is less than once a month, 94% think that the meeting frequency should be higher. Only 4% of all respondents wanted a lower meeting frequency, regardless of the frequency, see Figure 3.

It may be recommended to supervisors that a meeting frequency of at least every two weeks is perceived as appropriate. Meeting frequencies above this threshold are generally perceived as appropriate and rarely as excessive. Meeting frequencies below this threshold are perceived as too infrequent on average, and more regular meetings are desired.

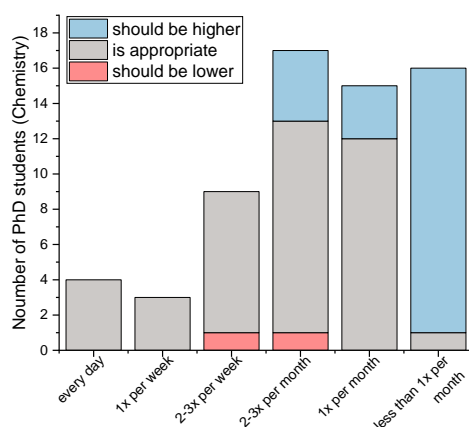


Figure 3: Number of doctoral students in chemistry, their meeting frequency and satisfaction with the frequency.

On average, PhD students in chemistry have seven **colleagues** in their group, and 83% say they are satisfied with communication with their colleagues, while 11% are not. 17% even reported having personal problems with at least one person in their group. Despite this, 78% of respondents said that their colleagues helped them with their daily tasks, 9% could not say, and 13% did not answer. Based on these results, it can be said that at least about 80% of the doctoral students are satisfied with their colleagues. The *Nacaps* study showed that 88%

of doctoral students were satisfied with the working atmosphere and 82% of graduates outside academia were satisfied with the working atmosphere. (Lara Berroth, 2022)

The following is an evaluation of a series of statements that the doctoral students had to classify according to **importance** in the context of the profession and **satisfaction** in everyday working life, see Figure 4. The data indicate that 79% of doctoral students in the MNF state that their salary is important to them. However, 48% (satisfaction *Nacaps* 70%; (Lara Berroth, 2022)) are satisfied with their salary. This result was much more serious in the chemistry department. Here, 88% said that their salary was important to them, but only 38% were satisfied with their salary. This also confirms the financial situation discussed earlier, where it was found that PhD students in Chemistry earn the lowest net salary on average. In addition, it was found that PhD students indicated that group management was more important to them (78%) than being satisfied (48% MNF, 46% Chemistry). Another aspect that was found to be unsatisfactory at the MNF at 45.3% compared to importance at 79.4% was job security (satisfaction 60% *Nacaps*; (Lara Berroth, 2022)). Chemistry PhD students rated importance slightly higher at 85%, but satisfaction was also higher at 67.6%. Two aspects that were rated as more satisfactory than important for doctoral students in both the Faculty and the Department of Chemistry were flexible working hours and independence in their work, with 71% (Chemistry 72%) indicating the importance of flexibility and 87% (Chemistry 88%) satisfaction, and 73% (Chemistry 70.3%) indicating the importance of independence and 66.5% (Chemistry 64.8%) satisfaction.

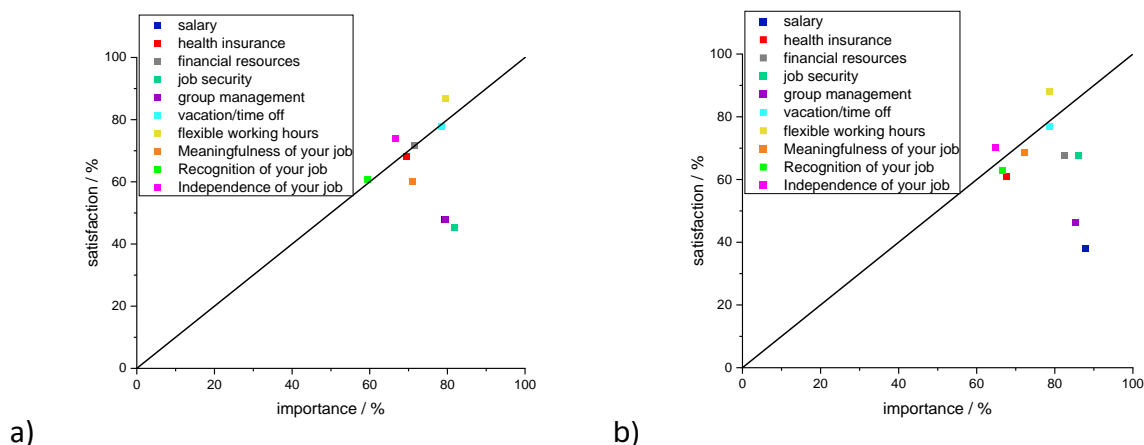


Figure 4: Presentation of the importance of various aspects of the job and the satisfaction of doctoral students in a) the entire MNF and b) in the Department of Chemistry in %.

In summary, doctoral students are most dissatisfied with their salary, group management, and job security. Doctoral students are more satisfied with the flexibility and independence of their jobs.

As part of the satisfaction survey, doctoral students were also asked if they had thought about quitting their doctorate at least once. In Chemistry, 39% of the doctoral students said that they had thought about quitting. This resulted in a correlation coefficient of 0.55 with the GHQ12 score, suggesting that unhappy students are more likely to think about leaving their doctoral

studies. It was also found that 63% of the doctoral students in Chemistry perceived the doctorate as a constant source of stress, 9% did not feel this way and 28% abstained. 68% perceive the doctorate to be very time-consuming, 9% do not and 24% abstain. 35% of the PhD students (Chemistry) stated that they did not have a good work-life balance, while 42% had the opposite opinion (76% *Nacaps*, (Lara Berroth, 2022)). A correlation coefficient of 0.50 was identified between the GHQ12 score and an inadequate work-life balance. This finding suggests that doctoral students, on average, experience poorer mental health when they report having an imbalance between their work and personal lives. Nevertheless, 77% of doctoral students indicated that they allocated an adequate amount of time to their research, while only 11% reported otherwise. These findings may reflect a normalization of a culture of constant overwork and stress, which has been previously documented in other surveys as a global issue affecting doctoral students. (Woolstone, 2019). Furthermore, it is not possible to determine the general reasons for students' lack of job satisfaction. It is only possible to assume them.

First of all, it can be said about **teaching** in chemistry that opinions about the teaching load are very controversial and often a 50/50 split can be observed. Either the PhD students are satisfied with the teaching or they are not. In general, teaching is very diverse, ranging from supervising bachelor and master theses, supervising lab courses or online courses, training other PhD students, giving seminars, supervising exams, organizing courses, or not teaching at all. Because the areas of responsibility are so varied, it is difficult to make general statements. Almost all PhD students spend significantly more hours per week on teaching than contractually agreed. In some cases, doctoral students spend up to six times the contractually agreed number of hours per week on teaching, see Figure 5. In this context, 38% of the doctoral students stated that they did not spend an adequate amount of time on teaching.

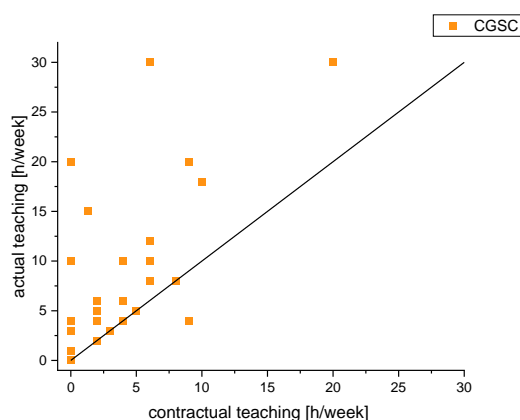


Figure 5: Presentation of the actual working hours spent by doctoral students in chemistry on teaching in hours per week plotted against the contractually agreed hours per week that doctoral students should spend on teaching.

The most common criticism of teaching was the unfair distribution of responsibilities between doctoral students and different research groups. About 30% of the PhD students said that they had to take over tasks from permanent staff. In addition, 26% of doctoral students reported that they did not receive feedback on their teaching, while 54% received feedback. 27%

reported that their teaching was not valued by their supervisor (professor or similar), but the same number of doctoral students reported that their teaching was valued. These results show that many doctoral students are satisfied with their teaching situation, but on the other hand, there are just as many doctoral students who report that the teaching load is not appropriate and that the distribution of teaching tasks is unfair. This overburdening of some PhD students with teaching, also due to the takeover of teaching duties from permanent staff, should be taken seriously.

Another part of the doctoral student survey dealt with experiences of **discrimination**. Recent incidents of discrimination at the University of Cologne in particular (Spiegel, 2023; WDR, 2023; F. P. WDR, 2023) have raised awareness of this aspect. This survey was conducted anonymously, and students were clearly informed that no conclusions could be drawn about individuals, so a representative picture of experiences of discrimination can be expected. First, it can be noted that most of the doctoral students did not experience discrimination. However, when they did experience discrimination, it was mostly in the nonverbal/verbal domain. For example, 28 out of 219 respondents reported being treated in a demeaning manner and 48 out of 219 reported being ignored or treated as invisible. 61 of 219 people reported being restricted in their self-expression and 26 of 219 people reported being ridiculed, see Figure 6a. In all of the non-physical examples of discrimination shown here, the distribution of which aggressor (supervisor, group leader, colleague) was responsible for the discrimination appears to be homogeneous. Multiple answers were possible, so a person could have experienced the same discrimination from different places. One person reported fearing for her physical safety in the presence of her supervisor, three in the presence of her co-workers.

Furthermore, it was found that there were incidents of sexual harassment in this faculty, with verbal harassment being the most common. Here, 13 out of 219 respondents reported having experienced verbal sexual harassment, 11 of them from a colleague. 4 people reported physical assaults from a colleague and one person reported being sexually assaulted against her/his will, also starting from a colleague.

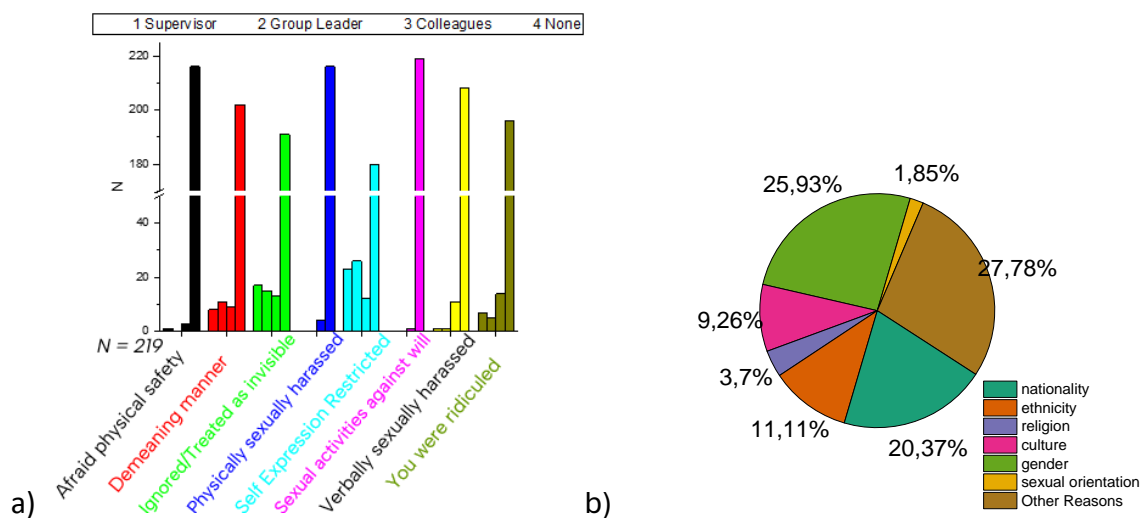


Figure 6: a) Anzahl an berichteten Diskriminierungsvorfällen aufgeteilt nach verursachender Person und Art des Übergriffs und b) Berichtete Gründe für erfahrene Diskriminierung.

The survey also asked about the reasons why the doctoral students had experienced discrimination. The most frequently cited reason was gender (26%) and nationality (20%), followed by ethnicity (11%), culture (9%), and religion (4%). In addition to these figures, we also received several reports in the free text boxes from people who had experienced or witnessed discrimination. We can advise these people to contact the relevant help centers mentioned in the survey.(CGSC)

It is difficult to place these incidents in the overall context of doctoral satisfaction. It can only be stated that these types of discrimination happen, that awareness should be raised and that such things must not be tolerated. Each and every one of these reported cases is unacceptable.

36.4% of PhD students reported being affected by the **coronavirus pandemic**. Of these, 79% reported that the coronavirus pandemic had a negative impact on the progress of their dissertation. The majority of PhD students (56%) felt that they did not receive sufficient support from their supervisor, 28% felt the opposite and 16% abstained. It is not possible to prove whether the coronavirus pandemic had an impact on the mental health of doctoral students, as there is no comparable study data from before 2020, but it can also not be denied.

The last topic is about the satisfaction with the graduate school. The **CGSC** - Cologne Graduate School Chemistry is responsible for the doctoral students in chemistry. Doctoral students feel lost in the regulations of the doctoral program, 43% stated that they did not feel well informed about the doctoral program and 48% stated that they had difficulties registering at the Graduate School. 72% stated that the registration through docfile was neither intuitive nor easy to use, 12% did not feel this way and 16% abstained. One aspect that was repeatedly mentioned as positive (in the free texts) was the course coordinator Dr. Heike Henneken and her organization. The main topics for improvement were the structure of the homepage, the course program, and registration.

For non-research related questions, doctoral students primarily sought help from other doctoral students. 100% of respondents indicated that they had sought this help, finding it helpful in 93% of cases and unhelpful in 7% of cases. The CGSC Coordinator, Heike Henneken, was the second most common source of help, with 45.5% of respondents saying they had sought help from her, and 91% finding it helpful. Seeking help on the CGSC homepage is also known, but rarely used: 64% were aware of this option, 34% used it. The option to search for help on the MNF home page was less well known, with only 43% of respondents aware of it. This is similar to the 42% awareness of the CGSC representatives. Very few students said they were aware of the Albertus Magnus Center (24%), and none of the doctoral students had used it. The "die Studierendenbefragung in Deutschland" has shown that there is a high demand for counseling, but that its use is lagging behind. One of the reasons for this is that help is sought in the private sphere (42%), or that there is not enough time to seek advice, or that the effort involved seems too great (29.9%). This survey also showed that the private environment is the first point of contact for advice, but it also showed that many respondents were not aware of some advice offices.

Conclusion and Outlook

This study was the first to collect data on the mental health and general satisfaction of doctoral students during their doctoral studies at the Faculty of Mathematics and Natural Sciences at the University of Cologne. This report by the doctoral representatives of the CGSC focused primarily on doctoral students in chemistry.

Using the GHQ12, it was found that 52% of doctoral students at the MNF were at a risk of having or developing a common psychiatric disorder, whereas in a comparative study of doctoral students in Belgium by *Levecque et al.* this indication was found in only 32% of respondents. In addition, it has been shown that doctoral students on average become unhappier the longer they pursue their doctorate, although this trend is more pronounced among chemistry doctoral students (9.1% of chemistry doctoral students do not feel happy in the first year of their doctorate, taking all circumstances into account, compared to 66.7% of those in their fifth year or more). The CGSC could therefore offer more seminars and workshops on mental health and stress management. In addition, an online suggestion box has been set up where PhD students can anonymously report problems, whether academic or personal. (see (CGSC) Homepage)

The main reason for dissatisfaction among PhD students is the low salary, with 50% of PhD students concerned about their financial situation. Poor group management was also mentioned, although 78% felt this was important, only 46% were satisfied with it. It was also noted that teaching tasks are perceived as unfairly distributed between students, permanent staff and research groups, that appreciation and feedback are sometimes lacking, and that more working time is spent on teaching than contractually agreed. At this point, these problems can only be pointed out; the system needs to be changed within the Institute.

Furthermore, it was found that cases of discrimination at the MNF occur mainly on a non-verbal and verbal level, and less often on a physical or sexual level, although there are also individual cases. At this point, reference can be made to the support services offered by the UoC (CGSC) and students are encouraged to seek help. The CGSC website has been updated to provide a quick overview of these services.

As part of the survey on the CGSC itself, respondents indicated that there are difficulties with registration in particular. More information about this will be available on the homepage in the future to hopefully make the registration process more convenient. In addition, the merger of *docfile* and *Klips* registration platforms is already in progress, so that only Klips needs to be used to register for doctoral studies.

In addition, regular meetings of doctoral students to discuss existing problems could in the future provide an even more accurate picture of the problems statistically recorded for the first time in this study at the MNF.

Correlations could be found between the GHQ score and whether the doctorate was perceived as a constant source of stress, as well as the question of a good work-life balance or satisfaction

with the supervisor, but it is difficult to establish a systematic causal relationship. This requires further studies and surveys over several points in time, as the cross-sectional data based on a single survey makes it difficult to draw causal conclusions. Nevertheless, supervisors and group leaders in particular seem to have a significant influence on feelings during the doctoral study. They are therefore primarily responsible for creating a pleasant working environment. This study provides the first representative results to identify and quantify existing problems at the MNF. We hope that this survey will stimulate lively discussions in the departments, at the MNF, and at the University of Cologne in order to improve the sometimes alarming systematic problems of doctoral students with regard to mental health, funding, supervision, workload, and teaching load.

In the future, the study could be conducted periodically to serve as a tool for tracking the situation of PhD students over the years to quantify possible improvements or deteriorations in terms of mental health, financial situation, supervision, etc. The study could also involve people from the field of social psychology in the design and/or evaluation of the study to generate further results.

Literature

BMAS. (Juli 2024). *Mindestlohn-Rechner*.

<https://www.bmas.de/DE/Arbeit/Arbeitsrecht/Mindestlohn/Mindestlohnrechner/mindestlohn-rechner.html>

BMBF. (2021). *Die Studierendenbefragung in Deutschland: 22. Sozialerhebung Die wirtschaftliche und soziale Lage der Studierenden in Deutschland 2021*

Boyd, C. M., Bakker, A. B., Pignata, S., Winefield, A. H., Gillespie, N., & Stough, C. (2011). A Longitudinal Test of the Job Demands-Resources Model among Australian University Academics. *Applied Psychology, 60*(1), 112-140.

<https://doi.org/https://doi.org/10.1111/j.1464-0597.2010.00429.x>

CGSC, C. G. S. C. <https://cgsc.uni-koeln.de/help-with-problems>.

DZHW. (2020). Wissenschaftliches Projektkonzept der National Academics Panel Study (Nacaps).

Goldberg, D. P., Gater, R., Sartorius, N., Ustun, T. B., Piccinelli, M., Gureje, O., & Rutter, C. (1997). The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychological Medicine, 27*(1), 191-197.

<https://doi.org/10.1017/S0033291796004242>

Goodwin, L., Ben-Zion, I., Fear, N. T., Hotopf, M., Stansfeld, S. A., & Wessely, S. (2013). Are Reports of Psychological Stress Higher in Occupational Studies? A Systematic Review across Occupational and Population Based Studies. *PLOS ONE, 8*(11), e78693.

<https://doi.org/10.1371/journal.pone.0078693>

Kolja Briedis, J. C., Steffen Jaksztat. (2020). Gesundheit als Gegenstand der Hochschulforschung: Erste Ergebnisse aus zwei DZHWStudien mit Promovierenden und Promovierten.

Lara Berroth, D. A., Kolja Briedis, Antje Wegner. (2022). Beschäftigungsbedingungen für junge Forscher*innen – ein empirischer Beitrag zu #IchBinHanna.

- 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.
- Representatives, G. (2022). *GSfBS Students Survey 2022*.
- Spiegel, L. E. D. (2023). *Vorwürfe wegen Machtmissbrauchs – Rechtsstreit um renommierte Professorin*. <https://www.spiegel.de/panorama/bildung/uni-koeln-vorwuerfe-wegen-machtmissbrauchs-rechtsstreit-um-renommierte-professorin-a-0b30a431-570a-4245-98f2-975b33173cf0>
- WDR. (2023). *Vorwürfe gegen Kölner Professorin*. <https://www1.wdr.de/nachrichten/hochschule-koeln-professorin-vorwuerfe-100.html>
- WDR, F. P. (2023). *Uni Köln: Professor soll Doktorandinnen sexuell belästigt haben*. <https://www1.wdr.de/nachrichten/rheinland/uni-koeln-belaestigung-professor-demo-102.html>
- Wegner, A. (2020). Die Finanzierungs- und Beschäftigungssituation Promovierender: Aktuelle Ergebnisse der National Academics Panel Study.
- Woolstone, C. (2019). PhD poll reveals fear and joy, contentment and anguish. *Nature*, 575, 403-406.