

# How can we help PhD students cope with mental health issues and drop-out? An extensive analysis of discourse.

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# Abstract

There is a growing concern regarding the increase of the mental health problems among PhD students worldwide. This problem is worrying, and it remains a major issue for research teams and labs. However, the particularity of this environment has not been explored in consistent enough ways to provide a clear way forward for universities and health services to answer this problem. Therefore, we carried out a large online survey and collected 480 testimonies on health issues and work conditions from doctoral students and young doctors. Our aim was to identify levers and key factors for intervention. A lexicometric analysis of the discourse was carried out, using the Iramuteq package for R. Results highlight a need to intervene at different levels, in terms of instruction, prevention, care and follow-up to reduce mental health problems among PhD students. It also highlights the perceived importance of the university and feeling of belonging to a community as possible factors to reduce these problems and reduce drop out probability. More than anything, the study reveals that there are no differences in the discourse of doctoral students according to their field, which reveals the generality of these processes.

## Theoretical Approach

### Theoretical approach

**There is a growing concern regarding the increase of the mental health problems among PhD students, as it is an issue observed worldwide but despite calls to action, effective ways to prevent this issue remain to be designed.** For example, a recent study of Evans, Bira, Gastelum, Weiss and Vanderford (2018) shows that this trend is found in the 26 countries of the study. It should be added that different comparisons reveal that PhD students are more depressed than other students or qualified workers <sup>2,3</sup>.

Indeed, repercussions of mental health problems are likely to include lower research productivity, diminished workforce talent and overall 'lost economic and social potential' if doctoral students fail to complete their research <sup>2,4</sup>. This problem is costly, humanly and economically and PhD drop-out remains a major problem for research teams and labs <sup>2,4</sup>. In France, the drop-out rate varies between 5% (in scientific and technical fields) and 45% <sup>5,6</sup>. The same trend is observed worldwide (i.e. a dropout rate from 30% to 50%) <sup>7</sup>. Also, it should be noted that PhD students are estimated to carry out half of the research conducted by universities <sup>8</sup>.

To answer this issue, recent research suggests that their high levels of stress could be caused in part or exacerbated by aspects of the doctoral education environment (field of research, type of supervision, grant... for a complete review of these aspects, see Waight & Giordano, 2018). However, the particularity of this environment has not been explored in consistent enough ways to provide a clear way forward for universities and health services to respond to this issue. Most of the available research on this topic present issues with the study design, sometimes involving very small sample sizes, convenience sampling among academic communities, lack of diversity or non-validated and non-standardized instruments for measurement or follow-up evaluation. Also, most studies conducted in North America do

not distinguish PhD students from other students and when they do, they sometimes extrapolate results from much smaller samples within the larger study and it can be difficult to extract specific factors related to health during PhD studies. Finally, if certain studies work on qualitative data, they mostly focus on specific biographical or academic factors, and aim to understand coping mechanisms among specific groups (LGBT or foreign PhD students). Due to this limitation, their results cannot be transferred beyond these populations.

## Research question and objective

In a few words, working conditions during PhD studies affect both the PhD students (their health and well-being, their social environment) and their institutions<sup>2,3</sup>. Indeed, PhD students are also part of research teams and contribute to the research process. In these conditions, a deterioration of working conditions or health has an impact on the quality of the work, the career prospects of the PhD students, and also on the functioning of the research teams, and on a larger scale it constitutes a loss for research and innovation<sup>2,4</sup>. However, most of the studies rely on closed quantitative methodologies or extremely limited qualitative samples. Therefore, we carried out a large qualitative survey and collected testimonies from doctoral students and young doctors. The objective of such an approach was to precisely identify the organization of health issues associated with a PhD and to contextualize them to identify levers and key factors for intervention.

## Methods

### Participants and procedure

480 testimonies were collected as part of a wider research on health issues and work conditions of French PhD students (mean age = 28.13 years, 68.3% women). These testimonies were collected from a large panel of PhD students and represent all research fields which exist in France. Participants were asked to answer a wide question about their PhD, "*In this part, we invite you to review your experience as a doctoral student (for example: your daily life, your motivations, your difficulties, the image of the doctorate, etc.)*". In addition to the sociodemographic variables (age, gender), an exhaustive set of academic variables were requested and introduced in our analysis: academic trajectory, fields of study, duration of PhD studies, self-assessment of the stage of completion of the thesis, type of supervision, the main source of funding. All details about the sample are presented in Table 1.

Participants were recruited by email using academic networks, specialized websites, and social networks. Several French universities and research groups also relayed our questionnaire. Only French PhD students and young doctors (less than 1 year since the graduation) were retained for the study, but all research fields were investigated. Explicit consent was requested at the beginning and at the end of the questionnaire.

Table 1

*Sociodemographic and academic characteristics of the sample*

Variables	<i>n</i>	%
Gender		
Women	328	68.3
Men	147	30.6
Trans/Gender non conforming	5	1
Academic trajectory		
Continuous study	406	84.6
Resumption of studies	71	14.8
Type of supervision		
A unique supervisor	226	47
Co-supervision	218	45.4
Co-tutelle <sup>a</sup>	36	7.5
Fields of study		
Law, Economics and Management	29	6
Humanities and Social Sciences	198	41
Sciences	94	19.6
Multidisciplinary	27	5.6
Health Studies	87	18.1
Duration of PhD studies		
enrolled in 1 <sup>st</sup> or 2 <sup>nd</sup> year	83	17.3
enrolled in 3 <sup>rd</sup> or 4 <sup>th</sup> year	245	51
enrolled in 5 <sup>th</sup>	81	16.9
doctor's title awarded less than a year ago	71	14.8
Self-assessment of the stage of completion of the thesis <sup>b</sup>		
At the beginning	27	5.6
In the middle (For example: data collection or analysis)	147	30.6
Near the end (For example: writing of the manuscript)	211	44
Pause, intended drop out	21	4.4

*Note.*  $N = 480$ . Mean age in the sample is 28.13 y.o. (SD = 3.06). <sup>a</sup> : co-tutelle is a particular type of co-supervision with a supervisor in a French institution and a supervisor abroad. <sup>b</sup> : a subjective assessment of the stage of completion was asked to complete the enrollment year and introduced in the analysis.

## Data Analysis

In this study, we opted for a software approach to analyze the qualitative data. Indeed, this approach allowed us to analyze and compare many and large texts to identify the main themes in these texts and how the different themes are related to each other. Furthermore, the software offered a significant contribution in terms of data visualization. In a few words, a lexicometric analysis of the interviews was carried out, using the Iramuteq package for R (R Interface for Multidimensional Analyses of Texts and Questionnaires) <sup>9,10</sup>. Iramuteq software splits the corpus into Elementary Context Units (ECUs), consisting of segments from 10 to 15 words each. Firstly, we performed a Descendant Hierarchical Classification (DHC). The DHC searches for the most frequently associated words within these ECUs and regroups the most similar ECUs within classes – also called thematic profiles <sup>11</sup>. At each step, the largest class is divided in two in order to form a set of classes that are as exhaustive and exclusive as possible. Within each class, the ECUs as well as the independent variables are tested on the basis of a  $\chi^2$  test to measure the strength of their association with the class. Then, the  $\chi^2$  and its significance value make it possible to identify the words that structure the thematic classes and interpret them (Figure 1).

In a few words, the DHC makes it possible to obtain coherent thematic classes from the discourse of participants to interpret them, as well as the significant and most representative categories among the independent variables inserted in the analysis (sociodemographic and academic variables) associated with these classes.

## Results

The DHC reveals that the discourse is organized according to six thematic classes (Figure 1) which indicates a strong heterogeneity in the discourse of the participants. In a few words, the analysis reveals a clear split between Node 1 (“Health”) that regroups health problems (Theme 1 : “Physical, mental health and impostor syndrome”, 10.6% of all ECUs ; Theme 2 : “Stress and malaise at work”, 18.7%) and personal problems related to work (Theme 3 : “Work/life interface”, 21.1%) and Node 2 (“Work”) that regroups thematic classes related to work (Theme 3 : “Work organization and additional responsibilities”, 12.4%), professional identity (Theme 4 : “Young researcher identity”, 17.4%) and future perspective (Theme 5 : “Perspective, future and precariousness”, 19.9%).

## Discussion

The results reveal the predominance of negative elements in the representation of the PhD studies among PhD students and young doctors. Starting with the three themes regrouped under Node 1 (health), we can distinguish several aspects of mental health issues among which Theme 1 (“Physical, mental health and impostor syndrome”) and Theme 2 (“Stress and malaise at work”) seem to oppose one another. While Theme 2 refers to a certain level of stress, it also refers to tasks and expected difficulties, considered as intrinsically part of PhDs and research: competitiveness, high levels of complexity, pressure to perform... On these questions, research teams, labs and institutions have little room to maneuver. Most of this stress is related to the amount of work and difficulties to maintain a high level of competence to carry out these tasks over the long term but it should be noted that it concerns mainly the 1<sup>st</sup> year of PhD. A lack of skill, work organization, experience or self-efficacy could explain the predominance of this topic at the beginning of PhDs.

On the other hand, the first theme depicts a psychopathological picture. It regroups terms associated with the impostor syndrome which relates to a mental state of self-doubt. Despite evident abilities and academic success, those suffering from this condition are unable to feel competent and accomplished as they live in a persistent fear of being discovered as intellectual frauds <sup>12,13</sup>. In addition, a certain number of psychological and behavioral symptoms linked to anxiety and depression are also regrouped in this theme (physical pain, sleeping problems, sick leaves...). In this regard, it should be noted that this early detection of anxious or depressive symptoms can be especially difficult if we consider the stress associated with research (as previously identified in Theme 2). Care should therefore take different forms. When possible, it seems necessary to provide more information to doctoral students and their supervisors on anxiety and depressive symptoms, as well as information on the impostor syndrome which seems to be associated with these symptoms. Though, it is known that students are unwilling to seek or receive help from health services because they perceive emotional distress as a potential threat for a successful career progression if psychiatric issues are revealed, especially among students who belong to minorities <sup>14-19</sup>. It is accompanied by poor knowledge of these services and the type of support they can provide <sup>17,20</sup>. However, it seems essential to work on the representations and the lack of knowledge associated with these services to promote care and limit the long-term repercussions on physical and mental health, and at a broader level on general functioning and the ability to maintain activities, work and avoid drop-out.

The same could be said for inability to maintain a satisfying work-life balance <sup>2,21</sup>. This challenge is often difficult to achieve in research and it cannot be considered as a part of PhD experience solely. However, acting at this level can limit personal and professional exhaustion and reduce the guilt and negative feelings associated with the inability to maintain this balance. In most cases, supervision focuses on methodological aspects or the research field and leaves aside work organization and support. Universities can intervene on this topic and train doctoral students in efficient work methods and project management to reduce this inability. Such training should not only have a positive impact on the short-term but also it should help PhD students to maintain their motivation and ability to work despite highly demanding tasks.

With regard to the factors linked to the work (Node 2), one of the key factors related to the doctorate experience seems to be the social environment (Theme 4) within which the doctoral student evolves, as well as the professional identity and the feeling of belonging he develops. The intellectual stimulation, the institution and the level of responsibility associated with his work are positive aspects which encourage the pursuit of the doctorate. In a way, these aspects reward the high level of demand and investment required. In fact, it appears more than ever necessary to take these aspects into consideration to promote the reduction of mental health problems among PhD students. In a nutshell, cognitive behavior therapy already demonstrated that dysfunctional thinking (such as the impostor syndrome) can alter mood, behavior and has a negative effect on health and general functioning<sup>22</sup>. It can also produce an underestimation of one's ability or a belief of incompetence. By emphasizing positive aspects of PhD studies (skills developed, feeling of belonging, intellectual stimulation...) it would be possible to reduce these dysfunctional beliefs and produce positive effects at these different levels.

Finally, the lack of security and confidence regarding post-doctorate and professional career (Theme 5) is another key element that needs to be addressed<sup>21,23</sup>. The integration of young doctors into society is more than ever necessary, whether in the public or private fields. Concrete actions to develop and support the post-thesis projects could benefit at several levels: reduce anxiety, increase well-being (and therefore reduce drop-out probability), establish new bridges between research and society. Unsurprisingly, this theme is associated with the end of the thesis. Especially if we consider the large number of ancillary tasks that seems intrinsically associated with PhD studies, among which we found tasks related to events, communication, teaching, etc. and leads PhD students to develop skills in a large number of fields outside of their field of expertise. An approach of their professional career in terms of skills rather than expertise seems to be an interesting way to develop self-efficacy, confidence and to reduce anxiety.

Although this is a convenience sample the extensive amount of qualitative data should prompt both academia and policy makers to consider intervention strategies. This study highlights a need to intervene at different levels, in terms of instruction, prevention, care and follow-up to reduce mental health problems among PhD students. It also highlights the perceived importance of the university and feeling of belonging to a community as possible factors to reduce these problems and reduce drop out probability.

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## Figures

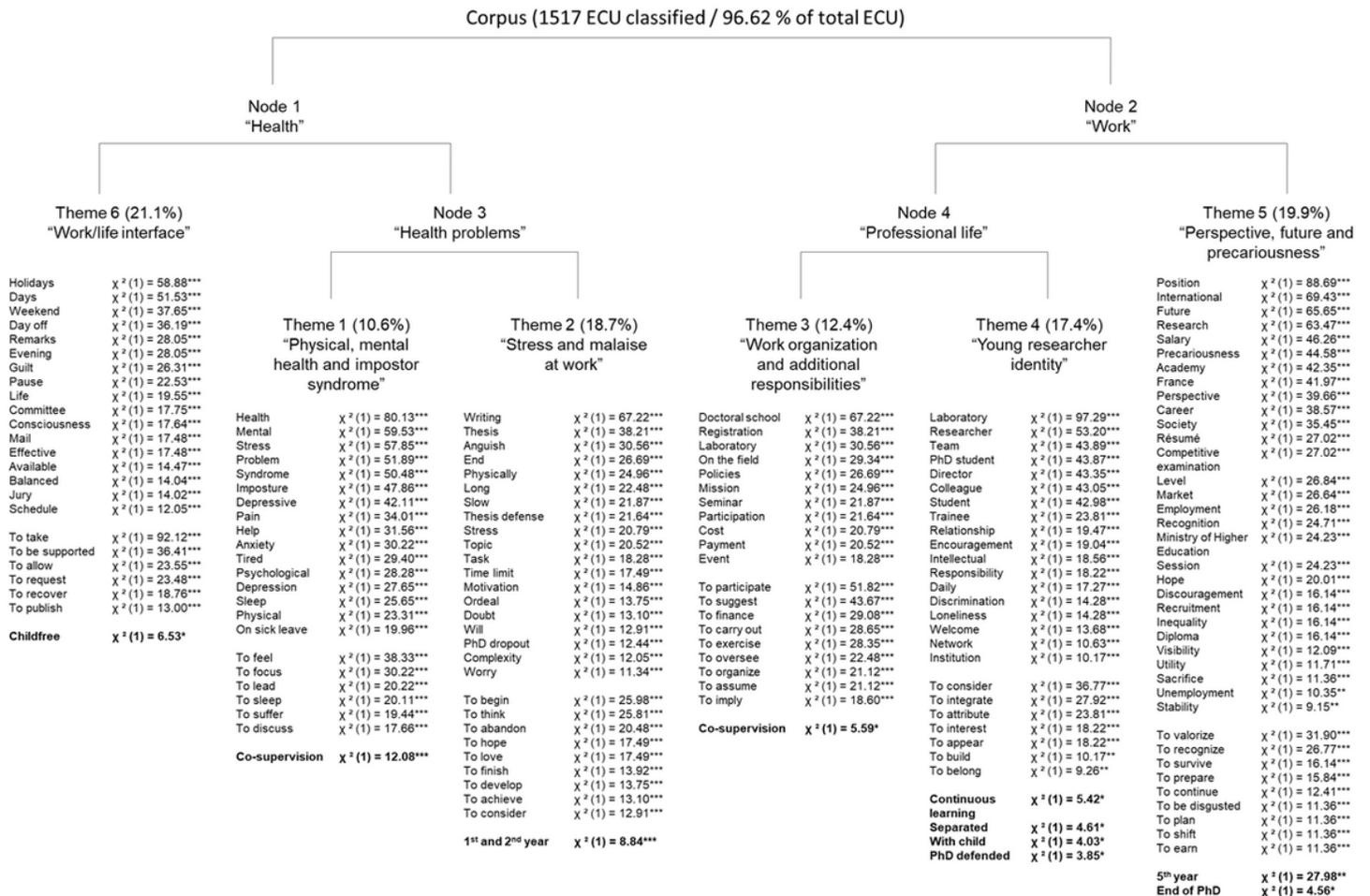


Figure 1

Dendrogram of the discourse of PhD students about doctoral studies Note. The dendrogram is a graphic representation of the distance between the thematic classes. The terms most often associated are grouped together in a same class and all classes are themselves organized in the dendrogram according to their proximity. Most representative categories among the independent variables are indicated in bold for each thematic class. \* : p-value < .05 ; \*\* : p-value < .005 ; \*\*\* : p-value < .001.