



# Job strain in German novice physical therapists

## Psychische Beanspruchung am Arbeitsplatz von Berufsanfängern in der Physiotherapie

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### Abstract

**Introduction:** International research shows high levels of job demands and psychological resources for physical therapists, and job strain is considered to be moderate. So far, publications are based on therapists with varying length of service. Little is known about job strain during the first year in the profession. **Aim:** To investigate the level of job strain of German novice physical therapists and to identify common workplace stressors. **Methods:** We conducted a web-based survey among physical therapists who had been working for 12 month or less. Using a self-administrated questionnaire, job strain was measured by its effects on work commitment, general health, job satisfaction, burnout and turnover intention. Subgroup analyses based on age, sex and rating of professional training were performed. Stressors at work were evaluated by priority and frequency of appearance. **Results:** Data of 153 physical therapists was analysed. Low levels of job strain were reported. Novice physical therapists showed high levels of workplace commitment and general health, and low levels of turnover. Moderate ratings were recorded for job satisfaction and symptoms of burnout. Inadequate compensation for work, high caseload, time pressure and physical stress were the most common stressors mentioned. Therapists who rated their professional training as positive reported lower levels of job strain. No significant differences between women and men or between therapists of different age were found. **Conclusion:** Although many workplace stressors are reported, novice physical therapists show low levels of job strain. Vocational training may be one important protective factor with regard to job strain.

### Abstract

**Hintergrund:** Internationale Studien belegen hohe Arbeitsanforderungen und hohe psychischen Ressourcen bei Physiotherapeut/inn/en; die psychische Beanspruchung am Arbeitsplatz wird moderat eingestuft. Bisherige Studien basieren auf Befragungen von Therapeut/inn/en mit unterschiedlicher Länge der Berufstätigkeit. Über die psychische Beanspruchung im ersten Berufsjahr ist jedoch wenig bekannt. **Ziel:** Erfassung der psychischen Beanspruchung von Berufsanfängern in der Physiotherapie in Deutschland und häufig auftretenden Belastungsfaktoren am Arbeitsplatz. **Methodik:** Wir führten eine Online-Befragung mit Physiotherapeut/inn/en mit bis zu einem Jahr Berufserfahrung durch. Der von uns entwickelte Fragebogen erfasste die psychische Beanspruchung anhand seiner Auswirkungen auf das Arbeitsengagement, den allgemeinen Gesundheitszustand, die Arbeitszufriedenheit, Burnout und Gedanken an Berufs-bzw. Stellenwechsel. Subgruppenanalysen hinsichtlich Alter, Geschlecht und Bewertung der Ausbildung wurden durchgeführt. Belastungsfaktoren wurden nach ihrer Bedeutung und Häufigkeit bewertet. **Ergebnisse:** Daten von 153 Physiotherapeut/inn/en wurden ausgewertet. Eine geringe psychische Beanspruchung wurde berichtet. Die Berufsanfänger in der Physiotherapie zeigten hohe Werte im Bereich des Arbeitsengagements und des aktuellen Gesundheitszustandes, und wiesen eine geringe Kündigungsbereitschaft auf. Arbeitszufriedenheit und Burnout-Symptome sind moderat. Mangelnde Entschädigung, hohe Arbeitsmenge, Zeitdruck und körperliche Belastung waren die am häufigsten genannten Belastungsfaktoren. Berufsanfänger mit positiver Bewertung der erhaltenen Berufsausbildung zeigten eine geringere Beanspruchung. Die Subgruppenanalysen hinsichtlich des Geschlechts und des Alters zeigten keine signifikanten Unterschiede. **Schlussfolgerung:** Obwohl die Berufsanfänger von zahlreichen Belastungsfaktoren berichten, schätzen sie ihre psychische Beanspruchung am Arbeitsplatz als gering ein. Dabei vermag eine positiv empfundene Berufsausbildung ein wichtiger protektiver Faktor für psychische Beanspruchung am Arbeitsplatz zu sein.

### Keywords

Job demands – job strain – novice physical therapist – physical therapy – workplace stressors

### Keywords

Arbeitsanforderungen – Psychische Beanspruchung – Berufsanfänger – Physiotherapie – Belastungsfaktoren



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## INTRODUCTION

Shortage of skilled workers is a topic of concern within the German healthcare sector, and physical therapy is one of the major bottleneck occupations (Bundesagentur für Arbeit, 2018). Brain drain from this profession has been observed (Hammer & Hebel, 2018) and junior staff is missing in this area. The number of physical therapy graduates is falling. According to the Federal Statistical Office, 6,186 students passed their state examinations at vocational school in 2013, but the number had fallen to 5,562 in 2017 (Statistisches Bundesamt, 2019). In the course of providing healthcare staff to deal with demographic changes and increasing numbers of multimorbid chronically ill patients (Robert Koch-Institut, 2015), job strain is an important topic to address. German DIN Standards define job strain based on the model of stress and strain by Rohmert & Rutenfranz (1975) as 'direct effects of workplace stress on the individual in relation to current and lasting individual conditions, including individual coping strategies' (DIN EN ISO 10075-1). High levels of job strain contribute to a variety of poor outcomes. At an individual level, continuing job strain can affect the physical and mental health of working people, and can lead to illness (Angerer et al., 2014), dissatisfaction and resignation (Firth et al., 2004). At a social level, job strain is associated with increased sick leave (Amiri & Behnezhad, 2020) and hence productivity losses, a higher burden on healthy co-workers, and higher turnover (Bridger et al., 2013). Both of these issues result in reduced work performance and decreased availability of skilled workers.

Physical therapists are exposed to a variety of stressors in their daily work. On the one hand, these stressors can be physical in nature due to the many repetitive movements, intensive manual techniques and awkward body positions (Campo et al., 2008; Passier & McPhail, 2011). Work-related musculoskeletal disorders are prevalent in this profession. In particular the lower back, the shoulder-neck area, as well as wrist and finger joints of physical therapists are affected (Bae & Min, 2016; Campo et al., 2008; Truszczynska et al., 2016). On the other hand, physical therapists are confronted with high levels of psychological stress as a result of rising demands and changes towards shorter and more intensive treatment units, time pressure, complex diagnoses and pathologies, multimorbid and frail patients, as well as rising bureaucratic burden (Gröbel, 2008; Li Calzi et al., 2006; Sliwinski et al., 2014).

Although physical therapists are exposed to a variety of demands and high psychological stress in their work, previous studies show that they predominantly classify their work-related stress as being moderate and report a moderate to increased level of job strain (Abaraogu et al.

2017; Brattig et al. 2014; Gröbel, 2008; Pavlakis et al. 2010). It is assumed that therapists benefit from the large amount of resources (e.g. social support, job satisfaction, job control), which can reduce the effects of the stressors (Abaraogu et al., 2017; Brattig et al., 2014; Campo et al., 2009; Gröbel, 2008).

Many studies point to a correlation between length of professional experience and job strain. According to Trucszyska et al. (2016), the number of years a physical therapist has worked in the profession correlates negatively to the level of stress at work. Sliwinski et al. (2014) found greater job satisfaction and lower risk of burnout among experienced therapists. Campo et al. (2009) pointed to an increased risk of turnover intention due to higher levels of job strain, especially among younger and female therapists. In Lindsay et al. (2008), young professionals report a higher number of workplace stressors in comparison to their experienced colleagues. In a study by Bae and Min (2016), the highest perceived work-related stress is found in therapists with 5–10 years of work experience and the lowest levels were found in the experienced group (over 15 years). Physical therapists with less than one year of clinical experience, however, were excluded from this study.

This study examines the issue of job strain and workplace stressors of novice physical therapists. Young professionals might be an important subgroup when discussing staff shortages and intention to quit in physical therapy. The first twelve months of employment constitute a phase in which novices gain their initial job experience, develop professional aims and might decide whether to remain in or leave their profession.

This study aims (1) to investigate the level of perceived job strain of German novice physical therapists, (2) to detect the differences in job strain among subgroups (age, sex, rating of professional training), and (3) to investigate the type and frequency of common workplace stressors.

## METHODS

### Study design and data collection

A survey was conducted from 28 August to 28 September 2018 using an electronic web-based questionnaire written in German. The questionnaire was created and published on the online platform SoSci Survey ([www.soscisurvey.de](http://www.soscisurvey.de)). Important information about this study (subject, purpose, procedure, contact) as well as information about data protection was presented in the survey introduction. Participation in the study was voluntary and data collection was anonymous. All the participants agreed to the informed consent before being enrolled in this study and linked to the questionnaire. No reward was received for participation.



## Subjects

All the certified physical therapists who had currently been working in this professional field for 12 months or less, with residence in Germany, were invited to participate. Participants who did not provide at least one valid response were excluded.

Subjects were recruited through two paths. Firstly, a link to the web-based questionnaire was posted in four forums for physical therapists. Secondly, 17 German vocational schools for physical therapy agreed to make their mailing lists of graduates (examination years 2018 and 2017) available for the study in order to promote participation. A reminder was sent after two weeks.

## Questionnaire

The study used a self-administrated questionnaire, which was subdivided into three sections: (A) job strain, (B) workplace stressors and (C) sociodemographic characteristics, including possibly strain-influencing factors such as rating of professional training, psychological resources and external factors. Items were constructed on the basis of a literature search and student consultations. None of the questions were mandatory, and participants could choose to skip answers.

**Job Strain:** Job strain was measured indirectly evaluating its effects. An overall score of a selection of five groups of effects was compiled. Items were taken from the subscale 'outcomes' of the German version of the Copenhagen Psychosocial Questionnaire (COPSOQ). The COPSOQ is an instrument that is widely used in Germany to record psycho-mental workload and job strain (Nübling et al., 2020). Questions about job strain were linked to the following five groups: workplace commitment (3 items), job satisfaction (7 items), general health (1 item), symptoms of burnout (5 items) and intention to turnover (2 items). Each item was on a five-point Likert scale. In order to identify health status, however, a number between 0 (worst) and 10 (best) has to be chosen on a visual rating scale. The results were displayed as percentage values of individual point scores. Items of 'symptoms of burnout' and 'intention to turnover' were therefore inverted. Values between 0 and 100 were possible.

**Workplace stressors:** A list of 21 work place stressors was supplied, subdivided into three groups: work environment, work organisation and work task. These were taken from four previous studies evaluating work-related stressors (Brattig et al., 2014; Keller et al., 2010; Lindsay et al., 2008; Lohmann-Haislah, 2012). The selection was based on student prioritisation. Participants were asked to tick those factors that cause job strain for them. In addition, a free-text field was displayed to provide an opportunity to add individual stressors not listed in the given options. All the selected stressors had to be rated regarding their

frequency of appearance in everyday work life from 1 = 'always' to 5 = 'hardly ever'.

**Characteristics of the sample:** Items to describe the sample included gender, age, educational level, residence (federal state), examination grade, clinical experience, type of clinic (outpatient, inpatient) and number of days of sick leave since job entry, as well as type of employment and monthly gross salary. Four self-developed items evaluated the professional training received at vocational school using a five-point Likert scale. Participants were asked whether they (i) rate their training generally positively, (ii) were able to apply what they had learned, (iii) felt well prepared for job entry and (iv) whether they felt able to meet job-related requirements. In order to describe the target group in more detail, participants were also asked to rate the personal resources: own professional expertise and knowledge, social support (friends, family), possibilities for stress reduction (e.g., sport, relaxation) and job control. These four resources had to be rated on a scale between 1 = 'very negative' to 5 = 'very positive'. Furthermore, common stressors (eustress and distress) outside the workplace setting were examined. A list of seven items was provided, on the basis of the results of students' consultations. Participants were asked whether they (a) frequented advanced training in addition to work, (b) had taken a vacation in the previous 4 weeks, (c) changed job, or (d) changed place of residence since career entry, (e) experienced stressful events in personal life, (f) are responsible for the care of children or relatives, or (g) suffer from a psychological disease.

The complete questionnaire in original language and English translation can be seen in the appendix.

## Pretest

In preparation of the study, a pretest of the questionnaire was carried out with 12 participants, nine of whom were novice physical therapists. The pretest aimed to identify potential problems in the functioning of the test or any difficulties in comprehension, which could lead to biased answers. In addition, the provided list of stressors was evaluated. Free-text fields were displayed on each page of the questionnaire in order to gather comments or remarks. No problems in technical functionality and usability were detected. Remarks on content and wording were discussed and changes were made where appropriate.

## Statistic

Data was analysed using IBM SPSS statistics 2018 software. All the responses were tabulated and descriptive statistics for all the items were obtained. Missing data was not considered in the analysis. To analyse the five different dimensions of job strain, a score of all the items of each dimension was formed and presented



as a percentage. Based on the study by Gröbel (2008), five categories were defined for the interpretation of the results: ‘0–19’ as very low, ‘20–39’ as low, ‘40–59’ as moderate, ‘60–79’ as high, ‘80–100’ as very high.

For the overall rating of job strain, mean and standard deviation of all the values of individual point scores were calculated. Five categories were defined for the interpretation: ‘0–19’ as very high, ‘20–39’ as high, ‘40–59’ as moderate, ‘60–79’ as low, ‘80–100’ as very low level of job strain.

Subgroup analyses based on sex, age and rating of professional training were performed. For each analysis, data was divided into two groups: firstly, questionnaires completed by males and females, secondly, those completed by younger ( $\leq 23$  years) and by older physical therapists, and thirdly, those completed by physical therapists who gave a positive rating of their professional training and those with a neutral or negative rating. An independent t-test was used for comparison between the pairs of groups. Correlations between the overall job strain score and age, or rating of professional training were measured using Spearman’s correlation coefficient. Results with  $p < 0.05$  were considered to be significant. Workplace stressors were reported according to frequency and percentage of being mentioned, and ranked.

## RESULTS

From 502 clicks, 176 questionnaires were edited (35.1%). A total of 23 questionnaires were excluded due to the following reasons: no valid answers ( $n = 12$ ), clinical experience ( $> 12$  months) ( $n = 9$ ) type of employment (not currently working as physical therapist) ( $n = 2$ ). Data of 153 therapists remained for evaluation.

### Characteristics of the sample

The respondents were aged between 19 and 40 years and had an average length of service of about eight months. Approximately two third of the respondents were women, and the majority were employed full-time in an outpatient medical facility. Characteristics of the sample are listed in Table 1.

The majority of participants reported their psychological resources positively: 85.0% of all the asked novice physical therapists rated their social support (by friends, family) as positive or very positive. 63.8% positively rated their opportunities for stress reduction, and 63.8% were satisfied with their job control. Regarding their own professional expertise and knowledge, 59.9% ranked this as positive or very positive, 29.6% as moderate and 10.5% as low.

In retrospect, professional training received at vocational school was seen very differently by the respondents (Fig.

Table 1: Characteristics of the sample.

	number	percentage
<b>gender</b>		
female	103	67.3
male	50	32.7
<b>age (years)</b>		
M (SD)	24.0 (2.9)	
<b>highest level of education</b>		
Mittlere Reife	35	22.9
Fachabitur	29	19.0
Abitur	69	45.1
University degree	20	13.1
<b>examination grade</b>		
very good (1)	31	20.3
good (2)	86	56.2
satisfactory (3)	33	21.6
sufficient (4)	3	2.0
<b>type of clinic</b>		
outpatient sector	124	81.1
inpatient sector	27	17.6
other	2	1.3
<b>professional experience (months)</b>		
M (SD)	8.2 (3.2)	
<b>employment</b>		
full-time	119	77.8
part-time	28	18.3
marginally employed	6	3.9
<b>days of sick leave</b>		
0 – 5 days	101	66.5
6 – 10 days	36	23.5
11 – 15 days	8	5.2
16 – 20 days	4	2.6
more than 20 days	3	2.0
not specified	1	0.7
<b>gross income (per month)</b>		
< 1.000 €	17	11.1
1.000 - < 1.500 €	14	9.2
1.500 - < 2.000 €	40	26.1
2.000 - < 2.500 €	66	43.1
2.500 - < 3.000 €	12	7.8
$\geq 3.000$ €	3	2.0
not specified	1	0.7
<b>residence (federal state)</b>		
Baden-Wuerttemberg	37	24.2
Bavaria	24	15.7
North Rhine-Westphalia	24	15.7
Rhineland-Palatinate	17	11.1
Brandenburg	10	6.5
Lower Saxony	8	5.2
others	31	21.6
not specified	2	1.3

M= mean; SD= standard deviation

1). It was predominantly rated as good. However, 23.7% of the respondents evaluated their education as mediocre and 16.5% as bad or even very bad.

Most of the physical therapists were of the opinion that they had been well prepared for job entry ( $n = 93$ , 61.2%), however, 22.4% ( $n = 34$ ) did not. The majority of respondents felt that they were able to meet job-related requirements ( $n = 87$ , 57.2%). But only 44.7% ( $n = 68$ )

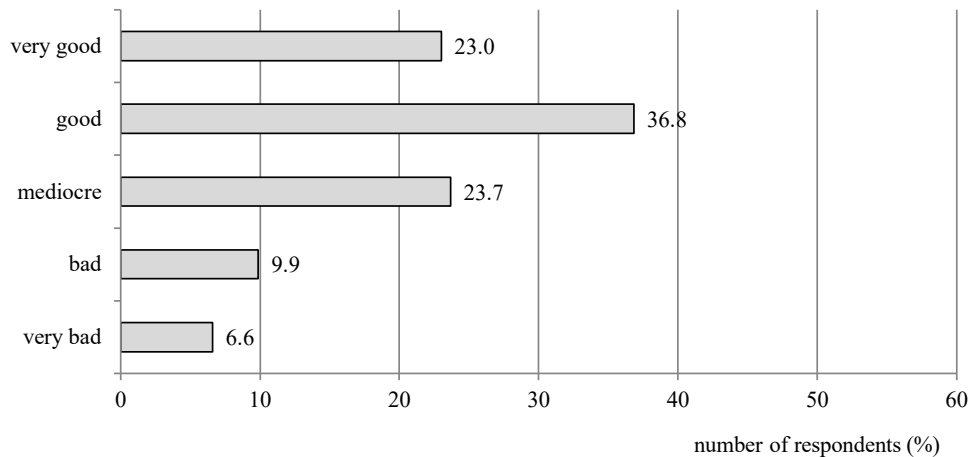


Figure 1: Rating of professional training received at vocational school.

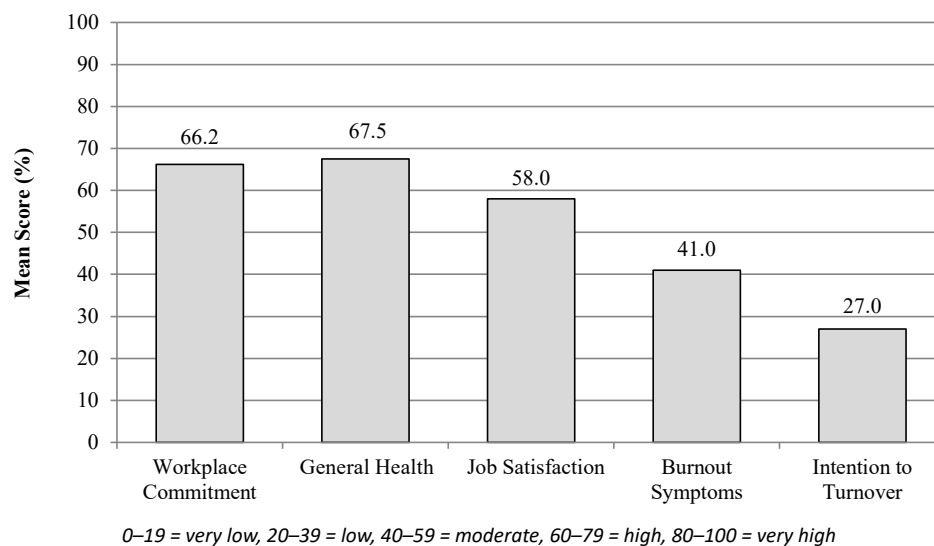


Figure 2: Different aspects of job strain.

agreed that they could apply what they had learned at vocational school.

### Job Strain

Low levels of job strain were reported with a mean overall score of 64.8 (SD = 6.3). Of the 153 respondents, 12 physical therapists (7.9%) rated their job strain as high or very high, 39 (25.5%) as moderate, and 102 (66.6%) as low or very low.

Regarding the five different aspects of job strain (Fig. 2), high levels of workplace commitment and general health as well as low levels of turnover were reported. Job satisfaction and burnout symptoms were rated as moderate.

### Subgroup Analysis

Statistical analysis revealed no significant between-group differences in job strain between women (64.9%) and men (65.5%) ( $p = 0.8$ ), or between therapists younger than 23 years (62.7%) and those older (67.2%) ( $p = 0.10$ ). However, significant differences in job strain ( $p < 0.01$ ) were found between the groups reporting positive (71.3%) or negative (56.0%) rating of professional training.

A significant positive correlation ( $r = 0.5$ ,  $p < 0.01$ ) between the rating of professional training and the overall job strain score was also noted. Respondents rated their professional training as positive reported lower levels of job strain. No correlation was revealed between age and the overall job strain score ( $r = -0.1$ ,  $p = 0.2$ ).

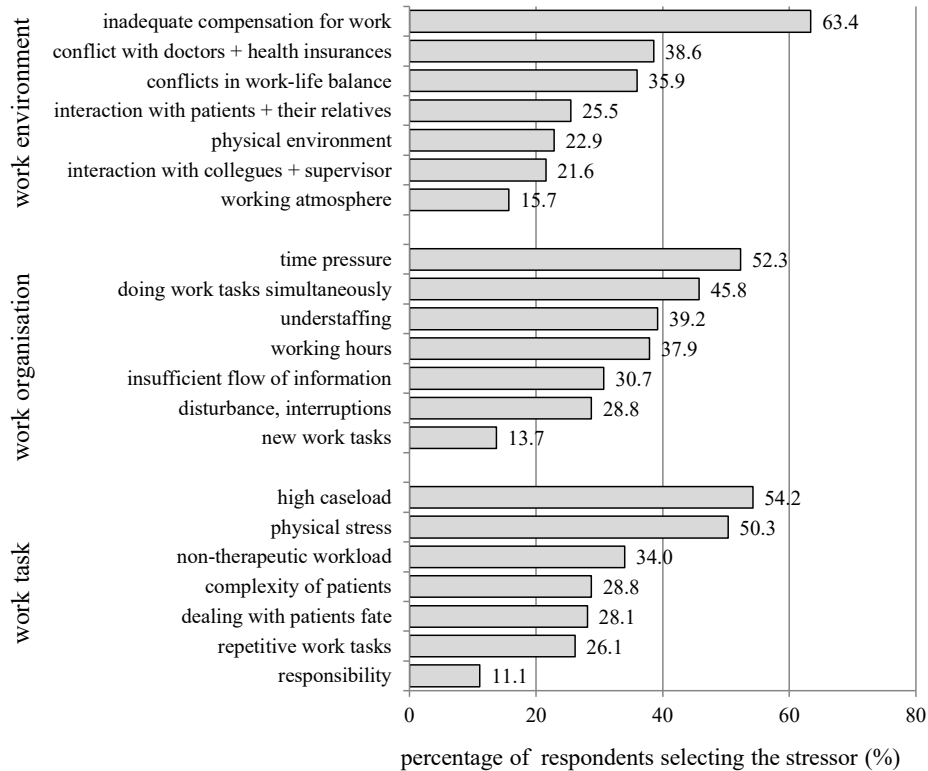


Figure 3: Workplace stressors.

### Workplace Stressors

On average, respondents reported 7.1 (SD = 3.7) stressors that contributed to job strain during their first year of profession. Figure 3 shows the complete list of work-related stressors with their frequency selection shown in percentage terms. Inadequate compensation for work (63.4%), high caseload (54.2%), time pressure (52.3%), physical stress (50.3%) and doing work tasks simultaneously (45.8%) were the most common workplace stressors mentioned.

With regard to the frequency of appearance of the selected stressors in everyday work life, inadequate compensation for work, high caseload and time pressure are also dominant. Three-quarters of the respondents who selected these factors indicated that these stressors appeared often or always in everyday work. ‘Physical stress’ appeared predominantly (62.3%) sometimes or often, and high values were measured in work organisation: more than 70% of the participants agreed that understaffing, doing work tasks simultaneously and stressful working hours appear often or very often in everyday work.

### External factors influencing perceived job strain

On average, novice physical therapists reported two influencing factors outside the workplace setting. 57.5%

stated that they frequently attended advanced training in addition to work, 34.0% had taken a vacation in the previous four weeks, 30.7% reported stressful events in private life, and 19.0% reported having changed jobs since career entry. Having changed place of residence or being responsible for the care of children or relatives were less frequently reported (<8%). Six respondents (3.9%) indicated that they suffered from a psychological disease.

### DISCUSSION

This study aimed to investigate job strain in novice physical therapists in Germany during their first year of profession. A sample of 153 physical therapists participated, most aged between 21 and 26 years, and employed full-time in an outpatient medical facility. In this present study, the surveyed novice physical therapists reported a low level of job strain. These results are in accordance with those of the survey by Gröbel (2008) of German physical therapists with varying amounts of experiences: Participants also described positive outcomes in job strain, although high job demands were reported. A study by Truszczyńska et al. (2016) of young physical therapists in Poland who had been employed in their profession for 6.3 years on average also confirms this observation. The majority



of Polish therapists (51.9%) reported a low level of job strain.

However, the impact of job strain in novice physical therapists should not be underestimated. Attention should be paid to the percentage of those who suffer from workplace stress and high job strain. In this study, there were at least 7.9% of the participants who reported high or very high levels of job strain. In Truszczyńska et al. (2016), there were 16.7% young professionals with high to very high levels of job strain.

Regarding the five dimensions of job strain, high levels of general health and workplace commitment and low levels in turnover intention were identified. The symptoms of burnout were considered to be moderate. These results are similar to those for German physical therapists with different length of service (Gröbel, 2008). One possible explanation may be presentism caused by high social pressure under which newcomers to the profession find themselves. This can include perceived obligations to their patients and concerns about the consequences of missed appointments, or concerns about colleagues having to cover their absence by working overtime.

Regarding job satisfaction, only moderate ratings were recorded. This is in contrast to the other German surveys, which point to high levels of job satisfaction among physical therapists (Brattig et al., 2014; Gröbel, 2008), and also among novices with up to three years of experience (Blümke et al., 2019; Dieterich et al., 2019). One explanation might be that this study focused on the first year of profession, and consequently, there is a lack of experience in this group. Previous studies on new graduate nurses showed a positive correlation between length of service and job satisfaction (Cheng et al., 2015; Halfer & Graf, 2006). Sliwinski et al. (2014) also found greater job satisfaction and lower risk of burnout among experienced physical therapists.

Another explanation may be related to some of the dominating factors, which influence job satisfaction. With regard to the individual items describing job satisfaction in this study, therapists voiced dissatisfaction with their salary and indecision about their career prospects in particular. In the study by Brattig et al. (2014), a third of German physical therapists also mentioned higher wages as an important factor to promote job satisfaction. It can be assumed that the importance of remuneration for entrant workers is decisive, especially against the background of the financial costs of their professional education. At the same time, the wage can be seen as a sign of appreciation for work done. A possible explanation for the indecisiveness of career perspectives is the current discussion in politics and the media regarding the role of the physical therapists. The effect of the shortage of skilled workers has become evident. Physical therapy is also currently in a phase of upheaval: model projects

are being initiated, and academisation is progressing. At present, however, it is unclear how these issues will affect the profession and the perspectives of therapists.

The novice physical therapists in this study experience many stressors at work. Nevertheless, the resultant strain is perceived to be low. The presence of high coping capacities and psychological resources may serve to counteract the stressors. In this study, there were a number of psychological resources that were held in high regard by the respondents: workplace commitment, social support, and job control. According to the Job Demands-Resources model of Demerouti et al. (2001), it may be these resources that serve as protective factors and have a pronounced mitigating effect on the burdens experienced by novice physical therapists. The high rating of job control also suggests a classification in the active job category of Karasek's demand-control model in which both the demands and the perceived control are high, resulting in little strain (Karasek, 1979).

This study indicates that the professional training received at vocational school is a significant influencing factor. 22.4% of the surveyed novices did not feel well prepared for job entry and did not feel able to meet job-related requirements. Almost every third subject stated that they could not implement what they had learned at vocational school. This also applies vice versa: a positive perception of the training received was accompanied by a lower level of job strain. This result is in line with the studies on medical graduates. Brennan et al. (2010) showed that a lack of clinical experience and competences as well as subjective perceptions of insufficient preparation through medical studies contribute to an increased experience of strain. Therefore, a good and highly professional practice-oriented training may be an important protective factor curbing job strain, and can be a possible starting point to ameliorate transition to practice for novice physical therapists.

## LIMITATIONS

In this study, job strain is recorded using a subjective analysis procedure. This could be a possible source of bias, as the self-assessment can be influenced by the subject's characteristics and expectations as well as his/her current life situation (Böckelmann & Seibt, 2011). By collecting data at a single point in time, currently dominant strain factors or positive events can have a greater impact on an individual assessment and distort the perceptions of the subject. In this context, it should be pointed out that the survey took place during a holiday period. At least 34.0% of all the novice physical therapists asked reported that they had taken a vacation in the previous four weeks. It can be assumed that the physical therapists would have been more relaxed due to the summer holidays and that



the number of patients being treated would be lower.

A self-administered questionnaire was used in this survey, which has not been evaluated as a measuring instrument. This poses a risk of bias. However, for validation purposes a pretest was carried out during the development of the questionnaire and changes were adapted accordingly.

The survey addresses physical therapists throughout Germany. By sharing the link via online portals, wide access to the survey was made possible. However, the results regarding the place of residence indicate that some federal states are underrepresented and the majority of the participants reside in the southwest of the country. One reason for this could be the sharing of the link via vocational schools. Most schools who agreed to forward the link to their graduates were situated in the southwest of Germany.

A further important limitation is the under-representation of physical therapists employed in the inpatient sector (hospitals and clinics), with only 17.6% of all the participants practicing in this sector. As a result, the results of the study are dominated by the situation of newcomers to the profession who are employed in outpatient facilities (81.1%). This may also be a source of bias because lower levels of job strain can be assumed for those working in hospitals—due to the higher salaries (collective labour agreements), reduced level of bureaucratic burdens and fewer patients per hour.

## CONCLUSION

In this study, novice physical therapists in Germany reported low levels of job strain. They identified various workplace stressors, but at the same time showed high levels of workplace commitment, general health and psychological resources, which might be strongly protective factors. However, many workplace stressors, in particular inadequate compensation for work, high caseload, time pressure, physical stress and requirements to perform work tasks simultaneously, as well as moderate levels of job satisfaction and burnout symptoms were reported.

These results present potentials to improve the situation of novice physical therapists in order to maintain job satisfaction and health. In particular, this includes the introduction of health promotion programs within workplaces and improvement of professional training at vocational school for better integration of learned skills into practice.

## Ethical approval, registration

n.a.

## Conflict of interest

None.

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## Appendix 1: Questionnaire in German (original language)

### A) Psychische Beanspruchung

A1 Arbeitsengagement	
<b>Wie oft treffen folgende Aussagen auf dich zu?</b>	
5 immer	
4 oft	
3 manchmal	
2 selten	
1 nie / fast nie	
N kann ich nicht beurteilen	Quelle:
Bei meiner Arbeit bin ich voller Energie.	COPSOQ B14.1
Ich bin von meiner Arbeit begeistert.	COPSOQ B14.2
Ich gehe völlig in meiner Arbeit auf.	COPSOQ B14.3
A2 Gesundheitszustand	
<b>Wenn Du den besten denkbaren Gesundheitszustand mit 10 Punkte bewertest und den schlechtesten denkbaren mit 1 Punkt: Wie viele Punkte vergibst Du dann für Deinen derzeitigen Gesundheitszustand?</b>	
Schlechtester denkbare Zustand	1 2 3 4 5 6 7 8 9 10 Bester denkbare Zustand
	COPSOQ B12
A3 Arbeitszufriedenheit	
<b>Wenn Du deine Arbeitssituation insgesamt betrachtest, wie zufrieden bist Du mit folgenden Faktoren?</b>	
5 sehr zufrieden	
4 zufrieden	
3 teils - teils	
2 unzufrieden	
1 sehr unzufrieden	
N kann ich nicht beurteilen	
Deinen Berufsperspektiven	COPSOQ B11.1
Den Leuten, mit denen Du arbeitest	COPSOQ B11.2
Den körperlichen Arbeitsbedingungen	COPSOQ B11.3
Der Art und Weise, wie Deine Abteilung geführt wird	COPSOQ B11.4
Die Art und Weise, wie Deine Fähigkeiten genutzt werden	COPSOQ B11.5
Deinem Lohn / Gehalt	COPSOQ B11.6
Deiner Arbeit insgesamt unter Berücksichtigung aller Umstände	COPSOQ B11.7
A4 Burnout - Symptome	
<b>Bitte gib für jede der folgenden Aussagen an, inwieweit diese auf dich zutrifft. Wie häufig...</b>	
1 nie / fast nie	
2 einige Male im Jahr	
3 einige Male im Monat	
4 einige Male in der Woche	
5 jeden Tag	
N kann ich nicht beurteilen	
... bist Du körperlich erschöpft?	COPSOQ B13.1
... bist Du emotional erschöpft?	COPSOQ B13.2
... fühlst Du dich ausgelaugt?	COPSOQ B13.3
... kommst Du zur Arbeit, obwohl Du dich richtig krank und unwohl fühlst?	COPSOQ B13.4
... kannst Du in deiner Freizeit die Arbeit nicht vergessen?	COPSOQ B13.5



<b>A5 Gedanke an Berufs-/Stellenwechsel</b>	
<b>Wie oft hast Du seit Berufsbeginn daran gedacht...</b>	
1 nie / fast nie	
2 einige Male im Jahr	
3 einige Male im Monat	
4 einige Male in der Woche	
5 jeden Tag	
N kann ich nicht beurteilen	
... deinen Beruf aufzugeben?	COPSOQ B10.1
... deine Arbeitsstelle zu wechseln?	COPSOQ B10.2

## B) Belastungsfaktoren

<b>B Belastungsfaktoren</b>
<b>Bitte kreuze an, welche der folgenden Faktoren dich bei der Arbeit (negativ) belasten.</b> (Mehrfachantworten möglich)
1 ja
2 nein
<b>Wenn ja: Wie häufig tritt der angegebene Belastungsfaktor in Deinem Arbeitsalltag auf?</b>
1 häufig
2 manchmal
3 selten
4 nie
N kann ich nicht beurteilen

<b>B1 Allgemeine und soziale Arbeitsumgebung</b>	
Umgebungsbedingungen (z.B. Raum, Lärm, Licht, Ausstattung)	Lindsay et al., 2008; Keller et al., 2010
Betriebsklima	Brattig et al., 2014
Interaktion mit Kollegen + Vorgesetzten	Brattig et al., 2014; Keller et al., 2010
Interaktion mit Patienten + Angehörigen	Keller et al., 2010
Interaktion mit Ärzten + Krankenkasse	Brattig et al., 2014
Arbeit-Freizeit-Konflikte (Work-Life Balance)	Brattig et al., 2014; Keller et al., 2010
Mangelnde Entschädigung für erbrachte Leistungen (z.B. Gehalt, Lob, Anerkennung)	Keller et al., 2010
<b>B2 Arbeitsorganisation</b>	
Arbeitszeiten	Keller et al., 2010
Zeitdruck, schnell arbeiten müssen	Brattig et al., 2014; Lohmann-Haislah, 2012
Verschiedenartige Arbeiten gleichzeitig betreuen (z.B. Fango, Therapie, Rezeption)	Lohmann-Haislah, 2012
Bei der Arbeit gestört, unterbrochen werden	Lohmann-Haislah, 2012
Konfrontation mit neuen Aufgaben	Lohmann-Haislah, 2012
Fehlender Informationsfluss / Kommunikation im Team	Lohmann-Haislah, 2012
Personelle Unterbesetzung	Lindsay et al., 2008
<b>B3 Arbeitsaufgabe</b>	
Arbeitsmenge (tägliche Patientenzahl)	Lindsay et al., 2008; Keller et al., 2010
Komplexität der Patienten (z.B. Multimorbidität)	Lindsay et al., 2008;
Konfrontation mit Patientenschicksalen, Emotionaler Stress	Brattig et al., 2014; Keller et al., 2010
Ständig wiederkehrende Arbeitsvorgänge	Lohmann-Haislah, 2012
Nicht-therapeutische Tätigkeit (z.B. Rezeptionstätigkeit, Büro)	
Hohe Verantwortung	Keller et al., 2010
Körperliche Belastung (z.B. Rücken, Handgelenke)	Keller et al., 2010
<b>B4 Weitere Faktoren (Optional)</b>	
Freie Eingabe	

## C) Beschreibung der Zielgruppe

C Soziodemographische Daten
<b>C1 Geschlecht:</b> <i>Bitte gib Dein Geschlecht an.</i> 1 weiblich 2 männlich
<b>C2 Alter:</b> <i>Bitte gib Dein Alter an.</i> Freie Angabe in Jahren
<b>C3 Bildungsabschluss:</b> <i>Bitte gib den höchsten Bildungsabschluss an, den du bisher erreicht hast.</i> 1 Fachhochschul-/ Hochschulabschluss 2 Abitur, Hochschulreife 3 Fachabitur, Fachhochschulreife 4 Mittlere Reife 5 Hauptschulabschluss
<b>C4 Wohnort:</b> <i>Bitte geb das Bundesland an, in welchem Du aktuell wohnst.</i> Auswahl Bundesland
<b>C5 Examensnote:</b> <i>Mit welcher Note hast Du Deine Ausbildung zum Physiotherapeut(in) abgeschlossen?</i> 1 sehr gut (1) 2 gut (2) 3 befriedigend (3) 4 ausreichend (4)
<b>C6 Art der Einrichtung:</b> <i>Wo arbeitest du als Physiotherapeut(in)?</i> 1 ambulante Einrichtung (Praxis, ambulantes Rehasentrum) 2 stationäre Einrichtung (Krankenhaus, stationäres Rehasentrum) 3 sonstige Einrichtung → Freie Angabe
<b>C7 Länge der Berufstätigkeit:</b> <i>Seit wann bist Du als Physiotherapeut(in) tätig?</i> Freie Angabe in Monaten
<b>C8 Krankheitstage seit Berufsbeginn:</b> <i>An wie vielen Tagen seit Berufsbeginn bliebst Du aufgrund eines gesundheitlichen Problems der Arbeit fern?</i> 1 0 – 5 Tage 2 6 – 10 Tage 3 11 – 15 Tage 4 16 – 20 Tage 5 mehr als 20 Tage
<b>C9 Arbeitsumfang:</b> <i>Wie viele Stunden in der Woche bist Du als Physiotherapeut(in) tätig?</i> 1 Vollzeit (wöchentliche Arbeitszeit ≥ 35h) 2 Teilzeit (wöchentliche Arbeitszeit von 15 – 34 h) 3 Minijob 4 Ich bin nicht als Physiotherapeut(in) tätig
<b>C10 Monatliches Bruttoeinkommen:</b> <i>Wie hoch ist ungefähr Dein monatliches Bruttoeinkommen?</i> 1 bis unter 1000€ 2 1.000€ bis unter 1.500€ 3 1.500€ bis unter 2.000€ 4 2.000€ bis unter 2.500€ 5 2.500€ bis unter 3.000€ 6 3.000€ oder mehr



<b>C11 Bewertung der Ausbildung</b>	
<b>Bitte gib an, inwieweit Du folgenden Aussagen zustimmst.</b>	
5 stimme voll zu	
4 stimme eher zu	
3 unentschieden	
2 stimme eher nicht zu	
1 stimme gar nicht zu	
N kann ich nicht beurteilen	
Rückblickend betrachtet bewerte ich meine Ausbildung als sehr gut.	
Was ich in meiner Ausbildung gelernt habe, kann ich in meiner Arbeit voll anwenden.	
Meine Ausbildung hat mich nicht gut auf den Berufsstart vorbereitet.*	
Durch meine Ausbildung fühle ich mich den beruflichen Anforderungen, die an mich gestellt werden, gewachsen.	

\* Frage invertiert

<b>C12 Externe Einflussfaktoren (7)</b>	
<b>Bitte kreuze diejenigen Faktoren oder Ereignisse an, die auf dich zutreffen. (Mehrfachantwort möglich)</b>	
1 nicht ausgewählt	
2 ausgewählt	
Arbeitsplatzwechsel seit Berufsbeginn	
Besuch von Fortbildungen parallel zur Arbeit	
Wohnortwechsel in den vergangenen vier Wochen	
(Erholungs-)Urlaub in den vergangenen vier Wochen	
Versorgung von Kindern oder pflegebedürftigen Angehörigen	
Belastende Ereignisse im Privatleben seit Berufsbeginn	
Vorliegen einer diagnostizierten psychischen Erkrankung (z.B. Depression)	

<b>C13 Persönliche Ressourcen (4)</b>	
<b>Wie schätzt Du folgende Faktoren für dich ein?</b>	
5 sehr positiv	
4 positiv	
3 neutral	
2 negativ	
1 sehr negativ	
N kann ich nicht beurteilen	
Eigenes (Fach-)Wissen	
Soziale Unterstützung (durch Freunde, Familie)	Keller et al. 2010; Lohmann-Haislah, 2012
Möglichkeiten zum Stressausgleich (z.B. Sport, Entspannung)	
Deinem Handlungsspielraum	Brattig et al., 2014; Lohmann-Haislah, 2012

## APPENDIX 2: QUESTIONNAIRE IN ENGLISH (TRANSLATION)

### A) Job strain

<b>A1 Workplace commitment</b>	
<b>How often do the following statements apply to you?</b>	
5 always	
4 often	
3 sometimes	
2 seldom	
1 never / hardly ever	
N Can't judge	References:
At my work, I am full of energy.	COPSOQ B14.1
I am enthusiastic about my work.	COPSOQ B14.2
I am immersed in my work.	COPSOQ B14.3
<b>A2 State of health</b>	
<b>If you evaluate the best conceivable state of health at 10 points and the worst at 0 points: How many points do you then give to your present state of health?</b>	
worst conceivable state of health	1 2 3 4 5 6 7 8 9 10 best conceivable state of health COPSOQ B12
<b>A3 Job satisfaction</b>	
<b>Regarding your work in general, how pleased are you with the following aspects?</b>	
5 very satisfied	
4 satisfied	
3 neither / nor	
2 unsatisfied	
1 highly unsatisfied	
N Can't judge	
Your work prospects	COPSOQ B11.1
The people you work with	COPSOQ B11.2
The physical working conditions	COPSOQ B11.3
The way your group is run	COPSOQ B11.4
The way your abilities are used	COPSOQ B11.5
Your salary	COPSOQ B11.6
Your job as a whole, everything taken into consideration	COPSOQ B11.7
<b>A4 Symptoms of burnout</b>	
<b>For each of the following statements please state how far they apply to you. How often...</b>	
1 never / hardly ever	
2 a few times a year	
3 a few times a month	
3 a few times a week	
5 every day	
N Can't judge.	
... do you feel physically exhausted?	COPSOQ B13.1
... do you feel emotionally exhausted?	COPSOQ B13.2
... do you feel worn out?	COPSOQ B13.3
... does it occur that you come to work, even though you really feel unwell and sick?	COPSOQ B13.4
... are you not able to stop thinking about work in your free time?	COPSOQ B13.5



<b>A5 Intention to turnover</b>	
<b>Since job entry, how often have you thought about...</b>	
1 never / hardly ever	
2 a few times a year	
3 a few times a month	
4 a few times a week	
5 every day	
N Can't judge.	
... giving up your profession?	COPSOQ B10.1
... changing your job?	COPSOQ B10.2

## B) Workplace stressors

<b>B Workplace stressors</b>
<b>Please tick all stressors that cause job stress to you.</b> (multiple answers possible)
1 not selected
2 selected
<b>If yes: How often does the selected stressor appear at work?</b>
1 often
2 sometimes
3 seldom
4 never / hardly ever
N Can't judge.

<b>B1 General and social work environment</b>	
Physical environment (e.g. rooms, noise, light, equipment)	Lindsay et al., 2008; Keller et al., 2010
Working atmosphere	Brattig et al., 2014
Interaction with colleagues + supervisor	Brattig et al., 2014; Keller et al., 2010
Interaction with patients + their relatives	Keller et al., 2010
Interaction with medical doctors + health insurances	Brattig et al., 2014
Conflicts in work-life balance	Brattig et al., 2014; Keller et al., 2010
Inadequate compensation for work (e.g. salary, praise, recognition)	Keller et al., 2010
<b>B2 Work organisation</b>	
Working hours	Keller et al., 2010
Time pressure, need to work fast	Brattig et al., 2014; Lohmann-Haislah, 2012
Doing work tasks simultaneously (e.g. fango, therapy, reception)	Lohmann-Haislah, 2012
Disturbance, interruptions at work	Lohmann-Haislah, 2012
Dealing with new work tasks	Lohmann-Haislah, 2012
Insufficient flow of information / communication in team	Lohmann-Haislah, 2012
Understaffing	Lindsay et al., 2008
<b>B3 Work task</b>	
Caseload (daily number of patients)	Lindsay et al., 2008; Keller et al., 2010
Complexity of patients (e.g. multimorbidity)	Lindsay et al., 2008;
Dealing with patients fate, emotional stress	Brattig et al., 2014; Keller et al., 2010
Repetitive work tasks	Lohmann-Haislah, 2012
Non-therapeutic workload (e.g. reception work, paper work)	
High responsibility	Keller et al., 2010
Physical stress (e.g. back, wrist)	Keller et al., 2010
<b>B4 Additional stressors (optional)</b>	
Free-text field	

## C) Description of the sample

<b>C Sociodemographic characteristics</b>
<b>C1 Gender:</b> <i>Please specify your gender.</i> 1 female 2 male
<b>C2 Age:</b> <i>Please specify your age.</i> Free input in years
<b>C3 Educational level:</b> <i>Please tick the highest level of education you have completed.</i> 1 University degree 2 Abitur, Hochschulreife 3 Fachabitur, Fachhochschulreife 4 Mittlere Reife 5 Hauptschulabschluss
<b>C4 Residence:</b> <i>Please specify the federal state you live in.</i> Selection of the German federal states
<b>C5 Examination grade:</b> <i>What was your final grade at state examination?</i> 1 very good (1) 2 good (2) 3 satisfactory (3) 4 sufficient (4)
<b>C6 Type of clinic:</b> <i>Where do you work as physical therapist?</i> 1 outpatient sector (practice for physical therapy, outpatient rehabilitation centre) 2 inpatient sector (hospital, inpatient rehabilitation centre) 3 other → free text input
<b>C7 Clinical experience:</b> <i>Since when have you been working as physical therapist?</i> Free input in months
<b>C8 Days of sick leave since job entry:</b> <i>How many days since job entry have you been absent from work due to health problems?</i> 1 0 – 5 days 2 6 – 10 days 3 11 – 15 days 4 16 – 20 days 5 20 days or more
<b>C9 Type of employment:</b> <i>How many hours do you work a week as physical therapist?</i> 1 full-time (weekly working hours $\geq$ 35h) 2 part-time (weekly working hours 15 – 34 h) 3 marginally employed 4 I do not work as physical therapist.
<b>C10 Monthly gross salary:</b> <i>What is your approximate gross monthly income?</i> 1 under 1.000€ 2 1.000€ to under 1.500€ 3 1.500€ to under 2.000€ 4 2.000€ to under 2.500€ 5 2.500€ to under 3.000€ 6 3.000€ and more





<b>C11 Rating of vocational training</b>
<b>Please indicate how far you agree with the following statements.</b>
5 to a very large extent
4 to a large extent
3 somewhat
2 to a small extent
1 to a very small extent
N Can't judge
In retrospect, I rate the professional training received at vocational school as very good.
I can fully apply at work what I have learned at vocational school.
Professional training did not prepare me well for job entry.*
Due to professional training I feel that I am able to meet job-related requirements.

\* item inverted

<b>C12 External factors influencing job strain (7)</b>
<b>Please tick all factors that apply to you.</b> (multiple answers possible)
1 not selected
2 selected
Job change since career entry
Advanced training in addition to work
Change of place of residence since career entry
Taken vacation in the previous four weeks
Responsible for the care of children or dependent relatives
Experienced stressful events in personal life
Suffer from a diagnosed psychological disease (e.g. depression)

<b>C13 Personal resources (4)</b>	
<b>How do you rate the following resources for you personally?</b>	
5 very positive	
4 positive	
3 neutral	
2 negative	
1 very negative	
N Can't judge	
Own professional expertise	
Social support (friends, family)	Keller et al. 2010; Lohmann-Haislah, 2012
Possibilities for stress reduction (e.g. sport, relaxation)	
Job control	Brattig et al., 2014; Lohmann-Haislah, 2012

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