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Job demands and resources related to burnout symptoms and work engagement in supervisors working with people with severe disabilities in social firms: a cross-sectional study

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4 **supervisors working with people with severe disabilities in social firms: a cross-**
5 **sectional study**
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Abstract

Objectives: To analyse working conditions and work and health-related outcomes of supervisors working with people with severe disabilities in social firms.

Design: Cross-sectional survey.

Setting: Social firms who employ between 30 and 50% severely disabled people with different types of disabilities on the general labour market.

Participants: Supervisors of social firms in Germany.

Primary outcome measures: Descriptive, bi- and multivariate analysis was used to analyse the relations between job demands (quantitative and emotional demands), job resources (meaning of work, perceived organisational support and influence at work), personal resources (resilience) and burnout symptoms as well as work engagement. Validated scales, e.g. from the Copenhagen Psychosocial Questionnaire (COPSOQ), were applied.

Results: 121 supervisors of social firms in Germany (60.3% were male and 38.8% female) participated within a cross-sectional quantitative online survey. Multiple hierarchical regression analysis indicated an association of quantitative job demands ($\beta = 0.221$, $p < .05$) and perceived organisational support ($\beta = -0.251$, $p < .05$) and burnout symptoms of supervisors in social firms. Meaning of work ($\beta = 0.285$, $p < 0.01$) and perceived organisational support ($\beta = 0.295$, $p < 0.01$) were significantly associated with work engagement.

Conclusions: Our study specified main job demands and resources for supervisors in German social firms and their impact on both burnout symptoms and work engagement. When designing measures for workplace health promotion in social firms, especially supervisors quantitative job demands needs to be reduced and perceived organisational support strengthened.

Keywords: health promotion, leadership, occupational health, social enterprises, social firms, working conditions

Strengths and limitations:

- The study was the first providing insights into working conditions and work and health-related outcomes of supervisors of social firms in Germany to develop recommendations for action on workplace health promotion.
- A strength of the study was the recruitment process of social firms via the REHADAT-Portal providing a list of social firms in Germany and the use of well-validated instruments.

- Limitations of the study resulted from the cross-sectional design restricting causal conclusions and the use of an online-survey allowing no descriptions of the population in which the survey was distributed.
- Likewise a possible selection bias could be introduced, e.g. due to voluntary participation of supervisors or due to non-response of participants with certain characteristics.

For peer review only

Background

In 2019, about 7.9 million severely disabled people lived in Germany, whereof 57% were integrated into the labour market. For comparison purposes, the employment rate of non-disabled people was about 82% ¹. For people with disabilities, employment exhibits a central component to establish self-esteem and responsibility, foster social skills and autonomy or to increase participation in the community ². However, discrimination, lacking opportunities to gain employment or ongoing symptoms of mental health conditions were reported as barriers to employment ^{3,4}.

Beside employment opportunities like sheltered workshops or supported employment, social firms serve first and foremost as companies on the general labour market in competition to other companies. In Germany, at least 30% up to 50% of people with different kinds of disabilities like mental, physical, sensory or multiple ones must be employed maintaining and inclusive employment approach with equal participation (§ 215, Book Nine of the German Social Code (SGB IX)). In general, employees are state-insured and receive agreed wages, wherefore they are seen as equal employees. Today, more than 900 social firms or departments employ about 13,550 severely disabled people primarily with mental and intellectual disabilities in a wide range of sectors like gastronomy, gardening and landscaping, industrial production or crafts ⁵. On an international level, social firms are also called “affirmative businesses, adapted enterprises, cooperatives, collectives [or], consumer/survivor-run businesses” (⁶, p. 39) with varying country, legislation or management characteristics.

When creating inclusive work environments in social firms, several job resources for its employees were identified in the current state of research ⁷. Not only high levels of flexibility ⁸⁻²², organised work tasks ^{8-13 15-18 20 21 23-26}, trainings ^{6 10 14 16 25} and high levels of job security ^{8-11 15 16 18-20 26} were provided, but also social support of co-workers and supervisors ^{6 8-31}. Due to the latter, recent exploratory studies indicate, that supervisors themselves experience several job demands, such as emotional demands. Systematic reviews and meta-analysis on emotional labour gained insight into its influence on well-being or work-related outcomes ^{32 33}. For instance, surface acting including the adaptation of emotion expression was associated with emotional exhaustion, depersonalization, mental distress, poorer physical well-being, the intention to quit or a decreased job satisfaction ³². Unique to the setting in social firms, supervisors need to pursue social *and* economic goals when operating a daily business on the general labour market resulting in additional quantitative demands on hours, pace, and work load ^{8 12 17 18 24 34}. In the past, several studies examined positive associations between high (quantitative) job demands and the development of emotional exhaustion ³⁵⁻³⁷ or burnout ^{38 39}. With a special regard to supervisors, quantitative workloads were significantly linked to an

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3 increased mental health risk in literature reviews⁴⁰. Three of the most frequently cited demands
4 for supervisors were simultaneous supervision of diverse tasks, strong deadline or
5 performance pressure or dis- and interruptions⁴¹.
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8 On the contrary, supervisors in social firms were provided with several resources according to
9 qualitative research, such as meaning of work³⁴. Based on the concept from Schnell et al.⁴²
10 meaning of work can be defined as "coherence, direction, significance, and belonging in the
11 working life" (Schnell et al, p. 4). Summarizing research found positive impacts of work
12 meaningfulness on motivation, organisational commitment, work engagement and job
13 satisfaction as well as negative ones on turnover intentions, burnout, stress, and
14 counterproductive behaviours^{43 44}. Additional long-term effects were also observed by Borritz
15 et al. stating that a high meaning of work predicted burnout at 3 years of follow up⁴⁵.
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21 Within the current state of research, it was also specified that supervisors who feel supported
22 at work report less commonly about negative strain reactions⁴⁰. The construct of perceived
23 organisational support postulates the extent to which employees perceive their organisation
24 as appreciating their effort and caring about their well-being⁴⁶. Two psychological mechanisms
25 provide a basis for the construct, including a high level of support of the organisation for the
26 employees' needs and the feeling of belonging to the organization, which in turn leads to a
27 higher level of identification with the organization. Due to the reciprocity to give something back
28 to the organization, a higher work engagement can be assumed⁴⁷. With regard to social
29 support from superiors or colleagues, supervisors reported on receiving slightly less support
30 than employees without a management function⁴¹.
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37 An additional job resource of supervisors in social firms could be assumed to be influence at
38 work which includes job characteristics concerning opportunities to make a decision, the
39 regulation of work content, its sequence and workloads⁴⁸. There is evidence that influence at
40 work appears to buffer negative strain reactions in supervisors⁴⁰. In fact, supervisors seem to
41 have significantly more influence at work in comparison to employees without a management
42 function, since they are more often able to plan and influence their amount of work as well as
43 breaks⁴¹.
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49 In light of the presented job demands of supervisors in social firms, personal resources can be
50 discussed that can mitigate negative effects of stress. For instance, resilience represents the
51 process of adapting to challenging situations and the ability to bounce back⁴⁹. The authors
52 Wagnild and Young subdivided resilience into "acceptance of self" and "personal competence"
53⁴⁹. Previous studies showed negative relations between resilience and burnout symptoms or
54 perceived stress^{50 51}, positive ones to work engagement^{52 53} or presented resilience as a
55 moderator in the relationship between stress and burnout⁵⁴.
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Theoretical Background

To gain insight into supervisors working conditions and personal resources in relation to the proposed work and health-related outcomes, the Job Demands–Resources (JD-R) model developed by Bakker and Demerouti was applied⁵⁵⁻⁵⁷. As depicted by the model, job factors depending upon enduring physical or mental effort can be considered as job demands, which are related to health impairment. On the contrary, job resources are represented by physical, psychological, social, and organisational factors which promote accomplishing work-related goals, reduce work demands and its related costs, and promote personal growth and development. Overall, the effects of the JD-R model were empirically proven, wherefore the model can be applied to predict burnout symptoms and work engagement, which in turn have an impact on organisational performance⁵⁵⁻⁵⁷.

Study Aims

Traced back to the presented limited evidence for social firms, the study aims at addressing the knowledge gap on working condition of supervisors in social firms including the links between supervisors' job demands (quantitative and emotional demands), job resources (meaning of work, perceived organisational support and influence at work), personal resources (resilience) and burnout symptoms as well as work engagement. Therefore, three research questions were stated:

- Are quantitative and emotional demands related to burnout symptoms and work engagement of supervisors in social firms?
- Are meaning of work, perceived organisational support and influence at work related to burnout symptoms and work engagement of supervisors in social firms?
- Is resilience related to burnout symptoms and work engagement of supervisors in social firms?

All variables were selected based on the current state of research.

Hypotheses

Referring to the displayed research evidence in combination with the JD-R model, the following hypotheses were developed and displayed in figure 1.

- *Hypothesis 1 (H1)*. Quantitative and emotional demands are associated with supervisors' burnout symptoms (1a) and work engagement (1b).
- *Hypothesis 2 (H2)*. Meaning of work, perceived organisational support and influence at work are associated with supervisors' burnout symptoms (2a) and work engagement (2b).

- *Hypothesis 3 (H3)*. Resilience is associated with supervisors' burnout symptoms (3a) and work engagement (3b).
- *Hypothesis 4 (H4)*. Resilience moderates the relationship between supervisors' quantitative and emotional demands and burnout symptoms.

-----Place figure 1 here.-----

Methods

Study Design and Recruitment process

The present study was planned as a cross-sectional online survey for supervisors in German social firms (according to § 215, Book Nine of the German Social Code (SGB IX)). Data was collected between August and November 2021. According to the REHADAT-Portal ⁵⁸, 1014 social firms were potentially eligible for participation from all 16 federal states (Figure 2).

----- Place figure 2 here-----

A total of 650 companies were randomized and contacted via email including leaflets with information on the study. After some weeks, the contacted companies received a reminder. Additionally, an invitation via e-mail was sent to members of the *bag:if* which serves as a representation of interests of social firms in Germany, reaching approx. 300 companies. Within both recruitment processes, managing directors were instructed to forward the survey invitation to direct supervisors within the company. Overall, participation in the survey was on a voluntary basis. Supervisors were informed about the study, its aims and data protection regulations and provided informed consent when entering the questionnaire. Inclusion criteria for participating in the study were predefined beforehand, including (1) supervisors who are employed in a social firm for at least six months, (2) who work at least 18 hours per week and (3) who are in direct contact with employees. The survey was accessed 191 times, consent was refused by nine supervisors, and 60 participants dropped out (reasons for non-participation could not be traced back due to the study design). Finally, 124 supervisors participated in the online survey and were considered for data analysis. Beforehand, the necessary sample size was calculated by using G*Power 3.1.9.7 ⁵⁹ based on an effect size of $f^2=0.15$ (medium effect according to Cohen ⁶⁰), $\alpha = 0.05$, six predictors and a statistical power of $\beta = 0.80$, resulting in 98 required participants.

Variables

Demographic and work-related Variables

The items gender, age, federal state, work experience, work time and number of locations were self-constructed. Professional qualification was designed referring to the *Mikrozensus*, an annual household survey conducted by official statistics in Germany ⁶¹. The number of subordinate employees was assessed via the Copenhagen Psychosocial Questionnaire

(COPSOQ ⁶²). When examining the size of the company, the definition for micro, small and medium-sized enterprises of the European commission was applied ⁶³. Gaining insight into the sectors of supervisors social firms, the five most prominent sectors were used according to German Bundestag ⁶⁴ with the possibility to report about other sectors.

Job Demands and Resources

Scales from COPSOQ were introduced to examine supervisors' quantitative and emotional demands as well as meaning of work and influence at work ⁶². An example of the five-item scale quantitative demands was "How often does it happen that you do not have enough time to complete all your tasks?". "Is part of your job to deal with other people's personal problems?" was an example item of the emotional demands two-item-scale. Meaning of work was assessed by using a two-item-scale (e.g. "Do you feel that your work is important?") and influence at work via a three-item scale (e.g. "Do you have much influence over decisions that affect your work?"). For all items a 5-point Likert scale was used and transformed to values from 0 (never/almost never/to a very low degree) to 100 (always/to a very high degree) ⁶². Psychometric evaluation of all COPSOQ scales indicated positive results ⁶².

When examining the perceived organisational support an eight-item-scale was used developed by Siebenaler and Fischer providing a Likert scale from 1 (totally disagree) to 7 (totally agree). An example item was "The organization shows very little interest in me." Since the survey only includes people from social firms, the name (in this case social firm) was directly included in the instruction, as described in the scope of application of the scale ⁶⁵. Perceived organisational support was evaluated as having a high psychometric quality and was validated by supervisors at various hierarchical levels ⁶⁵.

Resilience

To measure supervisors' resilience, a short form of the Resilience Scale, the RS-13 was included within the questionnaire with 13 items and a 7-point Likert scale (1 = I don't agree, 7 = I totally agree). One example item of the scale was "When I am in a difficult situation, I usually find a way out". Results are divided into low (13-66), moderate (67-72) and high levels of resilience (73-91). The psychometric evaluation of the RS-13 was considered as good in past research ⁶⁶.

Work Engagement

Work engagement was also assessed via the COPSOQ with a three-item-scale (e.g. "In my work I am full of energy") providing the possibility to choose on a 5-point Likert scale. Likewise the scale was transformed to values ranging from 0 (never/almost never) to 100 (always) ⁶².

Burnout symptoms

Likewise, burnout symptoms were also used from the COPSOQ which was traced back to the Copenhagen Burnout Inventory. On a 5-Point-Likert scale three items were introduced. An example item of the burnout symptoms scale was "How often are you physically exhausted?".

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3 Like the previous items, the three-item-scale was transformed into values from 0 (never/almost
4 never) to 100 (always) ⁶².

6 Data Analysis

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8 Statistical analyses was conducted using the software IBM® SPSS® Statistics (version 25).
9 Since only a little amount of missing data was identified within the final sample (5.6%), listwise
10 deletion was applied to maintain a complete dataset. Plausibility checks were run and data
11 was checked for normal distribution. Shapiro–Wilk test, skewness and kurtosis as well as
12 histograms partly showed lacking normal distribution justifying the use of a Spearman's rho
13 correlation. Prerequisites for multiple regression analysis were checked, including for instance
14 homoscedasticity of data or normal distribution of residuals. To analyse predictors of burnout
15 symptoms and work engagement, two hierarchical regression analyses were applied,
16 wherefore the order of variables could be determined and improvements of the model could
17 be observed when adding more variables. Predictors were introduced to the model based on
18 correlation analysis conducted beforehand. P-Values of <0.05 were evaluated as significant
19 and were given two tailed. Regression coefficients (β) indicated the effect size of predicting
20 variables, whereof $\beta = 0.1$ was interpreted as a weak, $\beta = 0.3$ as a moderate, and $\beta = 0.5$ as a
21 strong effect ⁶⁰. According to Cohen (1988) R^2 was classified as a small (0.02), medium (0.13),
22 and large (0.26) explained variance ⁶⁷. For moderation analysis on resilience, Hayes's
23 PROCESS macro version 4.0 for SPSS was used (model 1) ⁶⁸.

34 Patient and Public involvement

35 Patients or the public were not involved in the design, conduct, reporting or dissemination plans
36 of our research.

40 Ethical considerations

41 The study was approved by the Ethics Committee of the University Medical Centre Hamburg-
42 Eppendorf, Germany (LPEK-0191). All participants provided informed consent for data
43 collection after receiving information on data protection and analysis.

47 Results

48 Most of the 124 participants were male (59.7%) and between 51 and 60 years old (35.5%)
49 (Table 1). The majority of supervisors had a diploma, bachelor's degree, master's degree, state
50 examination or a teacher's examination (45.2%). Almost half of the participants were employed
51 in the social firm for one to five years (44.4%). 80.6% of participants worked between 31 and
52 40 hours per week. Most of the participating supervisors worked in hotels, restaurants and
53 gastronomy or in manufacturing companies (41.9% and 23.4%, respectively). At least one in
54 five supervisors worked in a social firm with more than five locations. 40.3% of supervisors
55 worked in medium-sized social firms with 50 to 249 employees and about one third were
56 responsible for 11 to 20 employees. Mostly they worked with employees with mental disabilities
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(n = 101; 81.5%), intellectual disabilities (n = 80; 64.5%), physical disabilities (n = 91; 73.4%), sensory disabilities (n = 86; 69.4%) or other disabilities (n = 22; 17.7%), whereby multiple choices were possible.

Table 1 Participant characteristics (n = 124)

Variables	n	%
Sex		
Male	74	59.7
Female	49	39.5
Divers	1	0.8
Missing	0	0.0
Age groups		
21-30 years	6	4.8
31-40 years	28	22.6
41-50 years	36	29.0
51-60 years	44	35.5
61-70 years	9	7.3
older than 70 years	1	0.8
Missing	0	0.0
Professional qualification		
Without professional qualification	1	0.8
Apprenticeship, vocational training in the dual system	34	27.4
Master craftsman/technician or equivalent technical college degree	28	22.6
Diploma, bachelor's degree, master's degree, state examination, teacher's examination	56	45.2
Doctorate	3	2.4
Other professional qualification	2	1.6
Missing	0	0.0
Work experiences in the current social firm		
Less than a year	5	4.0
1-5 years	55	44.4
6-10 years	25	20.2
11-15 years	22	17.7
15-20 years	11	8.9
More than 20 years	4	3.2
Missing	2	1.6
Work time		
Less than 20 hours	8	6.5
21-30 hours	10	8.1
31-40 hours	100	80.6
Missing	6	4.8
Sectors	*	

Hotels, restaurants and gastronomy	52	41.9
Building services	23	18.5
Gardening and landscaping	19	15.3
Manufacturing	29	23.4
Trade	25	20.2
Education and training	1	0.8
Other services	17	13.7
Other sectors	35	28.2
<i>Number of locations</i>		
1	53	42.7
2	18	14.5
3	18	14.5
4	10	8.1
More than 5	24	19.4
Missing	1	0.8
<i>Size of the company</i>		
1-9 employees	6	4.8
10-49 employees	61	49.2
50-249 employees	50	40.3
More than 250 employees	6	4.8
Missing	1	0.8
<i>Subordinate employees</i>		
1-10 employees	20	16.1
11-20 employees	37	29.8
21-30 employees	18	14.5
31-40 employees	4	3.2
41-50 employees	6	4.8
More than 50 employees	22	17.7
Missing	17	13.7

Notes. *Multiple choice answer.

Table 2 indicates descriptive statistics of the concerned variables including an acceptable reliability of all scales ($\alpha > 0.7$).

Table 2 Descriptive statistics of concerned variables

Variables	M	SD	Min	Max	α
<i>Job demands</i>					
Quantitative demands	57.58	14.77	15	95	0.74
Emotional demands	74.39	17.88	0	100	0.78
<i>Job resources</i>					
Influence at work	71.81	17.25	25	100	0.70
Meaning of work	85.47	14.79	50	100	0.79
Perceived organisational support	5.24	1.24	1.75	7	0.93
<i>Personal resources</i>					

Resilience	75.08	8.03	45	91	0.84
<i>Outcomes</i>					
Work engagement	71.10	15.5	25	100	0.78
Burnout symptoms	48.04	20.83	0	100	0.84

Spearman correlation coefficients were highlighted in table 3. The correlation between quantitative job demands and burnout symptoms was positive and significant. No significant correlation coefficients were observed for quantitative and work engagement or for emotional demands and both outcomes. The three job resources each correlated significantly positively with work engagement and significantly negatively with burnout symptoms. Resilience was significantly positively related to work engagement and significantly negatively to burnout symptoms. The correlation between work engagement and burnout symptoms was significant and negative.

Table 3 Spearman correlation.

Variables	1	2	3	4	5	6	7	8
1. Quantitative Demands	-							
2. Emotional Demands	.130	-						
3. Meaning of work	-.016	.245**	-					
4. Perceived organisational support	-.143	.018	.367**	-				
5. Influence at work	-.229*	.066	.272**	.495**	-			
6. Resilience	-.159	.142	.372**	.248**	.404**	-		
7. Work engagement	.014	.139	.476**	.424**	.342**	.312**	-	
8. Burnout symptoms	.323**	.050	-.192*	-.345**	-.235**	-.212*	-.287**	-

*Notes: Spearman correlation coefficient: * p < 0.05; ** p < 0.01.*

As depicted in table 4, perceived organisational support was the strongest predictor for burnout symptoms with nearly 13% of explained variance. Within model 2, quantitative job demands were introduced following an increase of 0.128 in R^2 ($p < .001$). In models 3 to 6, no significant changes of R^2 were observed. The complete model 6 with all predictors of burnout symptoms was significant ($F(9, 105) = 3,763, p < .001$) and explained about 17.3% of the variance (indicating a large explained variance⁶⁷). Considering the proposed hypothesis, hypothesis 1a can be partly confirmed, since quantitative demands significantly predicted burnout symptoms ($\beta = 0.221, p < .05$). Hypothesis 2 can partly be confirmed as well for perceived organisational support ($\beta = -0.251, p < .05$), but not for influence or meaning at work. Hypothesis 3 on resilience as a personal resource can also be rejected. Moderation analysis on resilience indicated no significant results leading to the conclusion that resilience did not moderate the relationship between quantitative and emotional demands and burnout symptoms (model fit: $F(3, 115) = 6,3857, p < .001$ for quantitative demands and $F(3, 114) = 2,8699, p < .05$ for

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3 emotional demands). Figure 3 provides an overview of the conceptual model and the
4 standardised coefficients.
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7 -----Place figure 3 here.-----
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9 Likewise, regression analysis of job demands as well as job and personal resources on work
10 engagement provided significant insights. Within the first model, meaning of work was included
11 as the strongest predictor explaining about 20% of its variance. In the next step, perceived
12 organization support was added, leading to an increase of R^2 of 0.108 ($p < 0.001$). For model
13 3 to 6, neither significant changes in R^2 nor significant predictors of work engagement were
14 observed. The complete model 6 with all predictors of work engagement was significant ($F(9,$
15 $106) = 6,751, p < 0.001$) and explained about 31% of the variance indicating a large explained
16 variance⁶⁷. As a result, hypothesis 1b on the influence of job demands on work engagement
17 can be rejected. Hypothesis 2b can partly be confirmed, since meaning of work ($\beta = 0.285, p$
18 < 0.01) and perceived organisational support ($\beta = 0.295, p < 0.01$) predicted work engagement
19 of supervisors in social firms (Figure 3). Hypothesis 3 on the personal resource resilience and
20 its effects on work engagement can be rejected.
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Table 4 Hierarchical regression analysis for burnout symptoms and work engagement

Burnout symptoms	1			2			3			4			5			6		
	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β
Perceived organisational support	-6.065 (-9.012; -3.119)	1.487	-.363***	-5.507 (-8.402; -2.613)	1.460	-.330***	-4.900 (-8.202; -1.599)	1.665	-.293**	-4.841 (-8.133; -1.549)	1.660	-.290**	-4.274 (-7.620; -0.923)	1.690	-.256*	-4.195 (-7.604; -0.786)	1.719	-.251*
Quantitative Demands				.314 (.084; .544)	.116	.234**	.298 (.064; .532)	.118	.222*	.287 (.053; .521)	.118	.214*	.302 (.068; .535)	.118	.224*	.297 (.060; .533)	.119	.221*
Influence at work							-.093 (-.333; .148)	.121	-.077	-.049 (-.298; .199)	.125	-.041	-.043 (-.290; .204)	.125	-.036	-.049 (-.300; .202)	.127	-.041
Resilience										-.307 (-.770; .157)	.234	-.120	-.195 (-.677; .288)	.243	-.076	-.207 (-.698; .285)	.248	-.081
Meaning of work													-.198 (-.453; .056)	.128	-.146	-.204 (-.464; .055)	.131	-.150
Emotional demands																.030 (-.174; .234)	.103	.027
n	114			114			114			114			114			114		
R ²	.156			.210			.214			.226			.243			.244		
Adj. R ²	.126			.173			.170			.176			.186			.179		

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Work engagement	1			2			3			4			5			6		
	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β
Meaning of work	.457 (.287; .627)	.086	.452***	.352 (.186; .518)	.084	.348***	.338 (.172; .504)	.084	.334***	.290 (.118; .463)	.087	.287**	.293 (.117; .468)	.089	.289**	.289 (.112; .465)	.089	.285**
Perceived organisational support				4.363 (2,308; 6,419)	1.037	.350***	3.608 (1.308; 5.907)	1.160	.289**	3.684 (1.408; 5.960)	1.148	.296**	3.657 (1.333; 5.975)	1.169	.293**	3.682 (1.360; 6.004)	1.171	.295**
Influence at work							.116 (-.045; .278)	.081	.130	.075 (-.090; .241)	.083	.085	.077 (-.091; .245)	.085	.086	.090 (-.081; .261)	.086	.101
Resilience										.305 (-.022; .631)	.165	.160	.308 (-.024; .640)	.167	.162	.324 (-.011; .658)	.169	.170
Emotional demands													-.010 (-.147; .128)	.069	-.012	-.018 (-.157; .121)	.070	-.021
Quantitative Demands																.068 (-.093; .229)	.081	.068
n	115			115			115			115			115			115		
R ²	.219			.327			.340			.360			.360			.364		
Adj. R ²	.191			.297			.303			.319			.312			.310		

* $p < 0.05$; ** $p < 0.01$. *** $p < 0.001$. Controlled for sex, age groups and professional experience.

Discussion

Within the current state of research, the presented study was one of the first analysing working conditions of supervisors in German social firms working with employees with severe disabilities on the general labour market. Significant relations between job demands and job resources and burnout symptoms or work engagement were presented by using hierarchical regression analysis. Referring to the proposed hypothesis, hypothesis 1a can be partly confirmed as quantitative demands significantly predicted burnout symptoms. Likewise, hypothesis 2a on perceived organisational support and its association with burnout symptoms can partly be confirmed. Stated hypothesis on work engagement were partly verified as well. Hypothesis 1b referring to job demands and its relation to work engagement can be rejected. In contrast, hypothesis 2b can partly be confirmed on meaning of work and perceived organisational support. Hypothesis 3 and 4 on the role of resilience as a personal resource were rejected.

Working conditions in relation to burnout symptoms and work engagement

Before conducting the study, a conflict between social and economic goals in social firms when operating a daily business on the general labour market was postulated in previous studies^{8 12 17 18 24 25}. Therefore, this assumption was operationalized by quantitative and emotional demands of supervisors. However, it was shown that only quantitative job demands were related to burnout symptoms of supervisors in social firms. These findings resonated with previous results, e.g. from supervisors in general⁴⁰, or from related settings like German sheltered workshops⁶⁹. Other initial insights from German social firms were provided stating high workloads especially due to staff shortages⁷⁰ or work absences of employees due to mental health conditions which must be intercepted by the supervisor at short notice³⁴. In fact, recent qualitative results wished for support by non-disabled colleagues in the department to buffer quantitative demands³⁴.

On the other hand, assumed relations of emotional demands and burnout symptoms or work engagement of supervisors could not be replicated which may indicate that emotional demands were perceived as less challenging or that sufficient support is already provided in these areas. Though, perceived emotional demands of supervisors appear much higher on a descriptive level in comparison to other occupations ($M=74.39$ vs. $M=52$ ⁷¹), wherefore more differentiated insights are needed. For instance, recent qualitative results informed about present fears and concerns of employees with disabilities in social firms, e.g. due to private problems³⁴. Therefore, cross-sectoral partnerships were claimed by other authors when allying both objectives – not only due to challenges when finding skilled staff but also for improving social and pedagogical support of supervisors¹².

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3 With regard to job resources, perceived organisational support was presented as a main
4 resource impacting both burnout symptoms and work engagement with nearly medium effects,
5 supporting the theory of organisational support by Eisenberger⁴⁷. Similar tendencies were
6 found by Zimber et al.⁴⁰ for supervisors in general stating social support as a central resource
7 buffering mental strain reactions and by Schwangler et al.⁷² on low levels of appreciation at
8 work (OR: 2.72; $p < 0.01$; 95%- CI: 1.32-5.58) as increasing the risk of burnout. Likewise, results
9 using the same construct to assess perceived organisational support concurred to worse
10 emotional exhaustion and depersonalization in disability support staff⁷³. As a consequence,
11 showing interest in supervisors, their opinions, in their well-being and job satisfaction, as well
12 as appreciation, consideration of their goals and values, and support in case of problems
13 represents one of the most important starting points for optimising their working conditions.

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The second job resource showing nearly medium positive effects on work engagement was
meaning of work. Beforehand, both impacts of meaning of work on work engagement and
burnout symptoms were identified which therefore could only partly be replicated^{43 44}. In
advance, qualitative results on supervisors of social firms presented a high perceived meaning
of work when employees made progress and gained more stability or improved language and
motor skills. An attributed meaning of work was also stated in comparison to other settings of
the general labour market³⁴ which was also underlined by descriptive statistics of the current
study ($M=85.47$ for supervisors in social firms vs. $M=75$ of other occupations⁷¹).

Contrary to previous research, influence at work was neither evaluated as affecting burnout
symptoms nor work engagement. However, qualitative results identified the supervisors ability
to influence their workload as well as decision-making processes as important resources³⁴. In
general, supervisors were described as having significantly more latitude in decision-making
in comparison to employees without a management function, wherefore (the amount of) work
as well as breaks could be planned with less effort⁴¹. Those differences were also apparent
when comparing means of supervisors ($M=71.81$) to other occupations ($M=42$)⁷¹.

Personal resources in relation to burnout symptoms and work engagement

Adverse to postulated hypotheses and results of previous studies⁵⁰⁻⁵⁴, present findings
indicated that resilience was neither associated with burnout nor with work engagement.
However, correlation analysis were in line with our hypothesis highlighting significant
associations to work engagement and burnout symptoms. Nevertheless, when introduced into
the regression model, results were evaluated as non-significant because working conditions
appear as stronger predictors of burnout symptoms and work engagement in comparison to
resilience. Likewise, no moderating effects of resilience were examined, which could be
interpreted as quantitative demands were linked to burnout irrespective of supervisors' levels
of resilience and underlining the health impairment process proposed by the JD-R model⁵⁵⁻⁵⁷.
According to the RS-13, supervisors were characterised as having high levels of resilience,

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3 indicating that they were able to adapt to challenging or adverse situations. Though, recent
4 results underlined that even with high levels of resilience, individuals are still subject to burnout
5 symptoms as resilience may offer protection to some extent, but no full prevention ⁷⁴.

8 Implications for policy and practice

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10 When referring to practical implications, health promotion interventions should be developed,
11 tested and evaluated for supervisors in social firms. It is recommended to combine both
12 structural and behavioural interventions to address supervisors' working conditions and own
13 behaviour ⁷⁵. On the one hand, structural approaches could reduce supervisors' quantitative
14 demands, which had according to present findings direct effects on burnout symptoms without
15 being buffered by the examined personal resources. In this context, a reduction of time
16 pressure, diminished workloads, higher staff ratios or more support by non-disabled colleagues
17 could be taken into consideration. Likewise, perceived organisational support of supervisors
18 could be addressed including interest in supervisors and their opinions, goals, well-being and
19 job satisfaction, appreciation and support in challenging situations. To increase and emphasize
20 supervisors' meaning of work, which was evaluated as affecting work engagement, team
21 meetings or workshops could be used to enable supervisors to reflect on their achievements
22 like progress among employees, elevated skills, independence or stability to strengthen
23 perceived meaning of work. On the other hand, regardless of our results but in line with other
24 studies, behavioral approaches could be added like resilience trainings to strengthen
25 supervisors' personal resources and in turn increase work engagement ⁷⁶.

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27 Especially managing directors of social firms should recognize themselves as important key
28 players when implementing health promotion interventions and a culture of health. In general,
29 since social firms were mainly considered as small and medium-sized companies ⁷⁷,
30 cooperation and regional partnerships for workplace health promotion can be used by pooling
31 resources, promoting networking and exchange, and receiving technical and financial support,
32 e.g. by social insurance institutions ⁷⁸.

44 Implications for future research

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46 When classifying the study with the current state of research, it became apparent that various
47 subject areas or research designs in the context of social firms were not applied yet. Future
48 research should focus on longitudinal studies with larger sample sizes gaining insights into
49 causal relationships between job demands, resources and work and health-related outcomes
50 of supervisors in social firms. In this context, effects of emotional demands should be examined
51 more differentiated, since the results of this scale at the descriptive level already appeared
52 higher compared to other occupations. Other job demands like physical ones could be included
53 as well as showing an increased risk for burnout in studies from related settings ⁷². Likewise,
54 COVID-19 pandemic-related influences on social firms ⁷⁹ or differences in sector and task-
55 specifics could be included as well in the analysis of working conditions of supervisors in this
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3 setting. Further research could also focus on health-oriented leadership, when promoting
4 supervisors' health and productivity on the one hand and enabling them to provide appropriate
5 support for their employees on the other hand. In the same vein, the role model function of
6 supervisors in terms of health and work behaviour could be researched ⁸⁰. Lastly, further
7 research could consider the evaluation of workplace health promotion interventions in social
8 firms or cooperation approaches between small and medium-sized companies.
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11 Strengths and limitations

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13 The study underlined the relevance of gaining insights into working conditions and work and
14 health-related outcomes of supervisors of social firms in Germany. A strength of the study was
15 the systematic and randomized recruitment process of social firms. Well-validated instruments
16 were applied and participants provided predominantly fully completed questionnaires.
17 However, the cross-sectional design of the study does not allow causal conclusions. Data was
18 collected via self-report measures which may introduce bias to our results. Furthermore, a
19 possible selection bias cannot be ruled out, either due to voluntary participation, so that
20 individuals with certain characteristics are more likely to participate in the study, or due to non-
21 response, wherefore participants with a certain characteristic drop out of the study or do not
22 participate at all. Likewise, the population in which the online survey was distributed cannot be
23 described ⁸¹, since managing directors were instructed to forward the survey. Therefore,
24 representativeness for all social firms in Germany cannot be expected.
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33 Conclusion

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35 The results were one of the first gaining insights into working conditions and its associated
36 outcomes of supervisors in German social firms providing people with disabilities employment
37 on the general labour market. Offered results mainly resonated with the proposed associations
38 according to the JD-R model. Health promotion interventions in social firms should reduce
39 quantitative demands and strengthen perceived organisational support of its supervisors to
40 promote work engagement and reduce burnout symptoms. Likewise, a high meaning of work
41 should be emphasized. Overall, more research is needed on the evaluation of workplace health
42 promotion interventions in social firms.
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Declarations

Data availability statement

The datasets analysed during the current study are not publicly available due to German national data protection regulations.

Competing interests

The authors declare that they have no competing interests.

Patient consent for publication

Not applicable.

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Authors' contributions

All authors conceived of the study and participated in its design. ACK, IE, VH and SM designed the online survey. ACK recruited supervisors of social firms, conducted statistical analyses and drafted the manuscript. IE, VH and SM contributed to data interpretation and to the revision of the manuscript. All authors read and approved the final version of the manuscript.

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Figure legends

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38 Figure 1

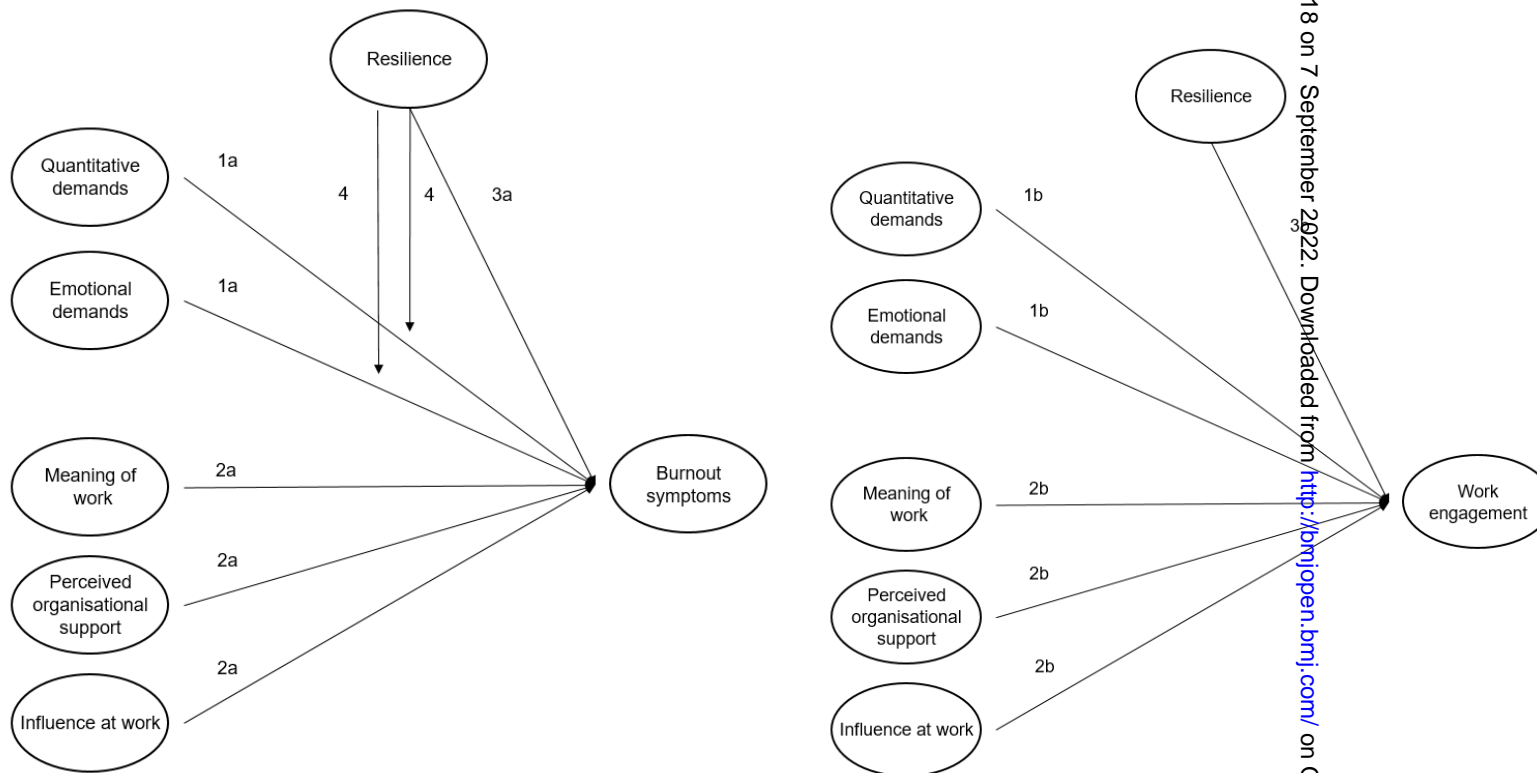
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40 Conceptual model of the study with displayed hypothesis.

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42 Figure 2

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44 Recruitment process of the study.

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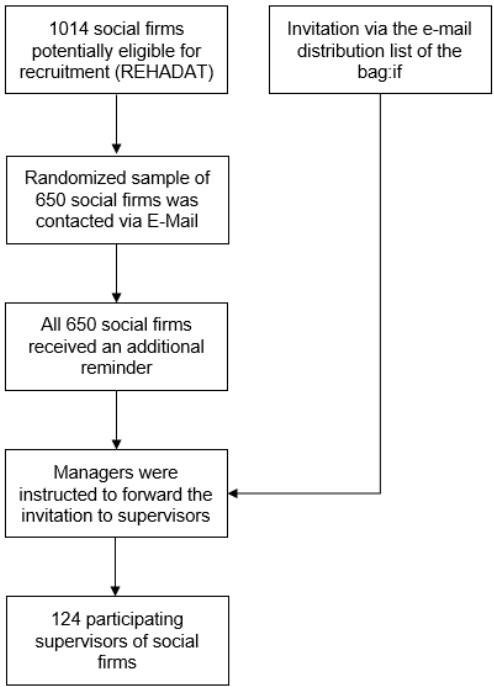
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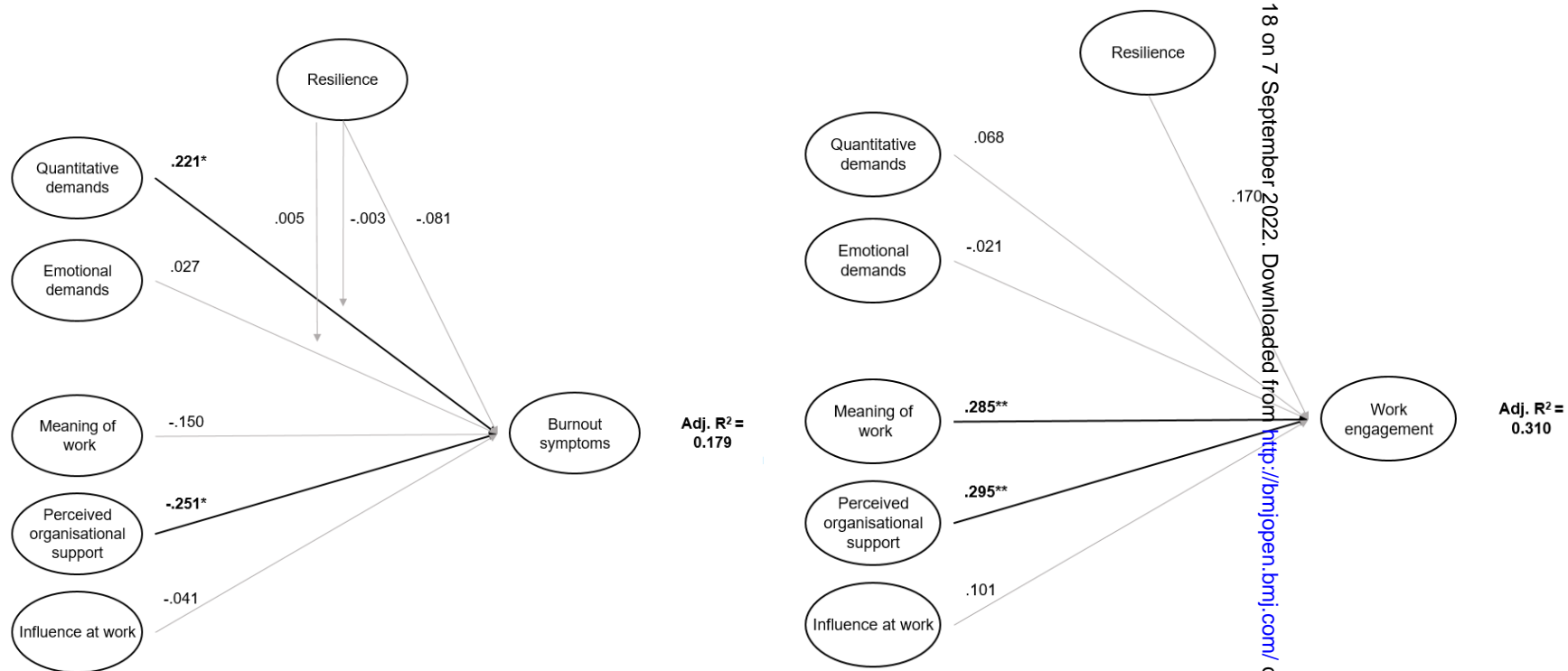
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STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of cross-sectional studies

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3-4
Objectives	3	State specific objectives, including any prespecified hypotheses	5-6
Methods			
Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-8
Data sources/measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6-8
Bias	9	Describe any efforts to address potential sources of bias	8
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	8
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	8
		(b) Describe any methods used to examine subgroups and interactions	Not applicable
		(c) Explain how missing data were addressed	10
		(d) If applicable, describe analytical methods taking account of sampling strategy	Not applicable
		(e) Describe any sensitivity analyses	Not applicable
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6
		(b) Give reasons for non-participation at each stage	Not applicable
		(c) Consider use of a flow diagram	6
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8-10
		(b) Indicate number of participants with missing data for each variable of interest	9-10
Outcome data	15*	Report numbers of outcome events or summary measures	10
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	13-14
		(b) Report category boundaries when continuous variables were categorized	Not applicable
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not applicable
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Not applicable
Discussion			
Key results	18	Summarise key results with reference to study objectives	15
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	18
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	18
Generalisability	21	Discuss the generalisability (external validity) of the study results	18
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Job demands and resources related to burnout symptoms and work engagement in supervisors working with people with severe disabilities in social firms: a cross-sectional study

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3 **Job demands and resources related to burnout symptoms and work engagement in**
4 **supervisors working with people with severe disabilities in social firms: a cross-**
5 **sectional study**
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Abstract

Objectives: To analyse working conditions, work and health-related outcomes of supervisors working with people with severe disabilities in social firms.

Design: Cross-sectional survey.

Setting: Social firms who employ between 30% and 50% severely disabled people with different types of disabilities on the general labour market.

Participants: Supervisors of social firms in Germany.

Primary outcome measures: Descriptive, bi- and multivariate analysis was used to analyse relations between job demands (quantitative and emotional demands), job resources (meaning of work, perceived organisational support and influence at work), personal resources (resilience) and burnout symptoms as well as work engagement. Validated scales, e.g., from the Copenhagen Psychosocial Questionnaire (COPSOQ), were applied.

Results: 124 supervisors of social firms in Germany (59.7% were male and 39.5% female) participated within a cross-sectional quantitative online survey. Multiple hierarchical regression analysis indicated an association of quantitative job demands ($\beta = 0.236$, $p < .05$) and perceived organisational support ($\beta = -0.217$, $p < .05$) and burnout symptoms of supervisors in social firms. Meaning of work ($\beta = 0.326$, $p < 0.001$) and perceived organisational support ($\beta = 0.245$, $p < 0.05$) were significantly associated with work engagement.

Conclusions: Our study specified main job demands and resources for supervisors in German social firms and their impact on both burnout symptoms and work engagement. When designing measures for workplace health promotion in social firms, especially supervisors quantitative job demands need to be reduced and perceived organisational support strengthened.

Keywords: health promotion, leadership, occupational health, social enterprises, social firms, working conditions

Strengths and limitations:

- The study was the first providing insights into working conditions, work and health-related outcomes of supervisors of social firms in Germany to develop recommendations for action on workplace health promotion.
- A strength of the study was the recruitment process of social firms via the REHADAT-Portal providing a list of social firms in Germany, the use of well-validated instruments and setting-specific complements.

- Limitations of the study resulted from the cross-sectional design restricting causal conclusions and the use of an online survey allowing no descriptions of the population in which the survey was distributed.
- Likewise, a possible selection bias could not be ruled out, e.g., due to voluntary participation of supervisors or due to non-response of participants with certain characteristics.

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Background

In 2019, about 7.6 million severely disabled people lived in Germany, whereof 57% were integrated into the labour market or looked for a job. For comparison purposes, the employment rate of non-disabled people was about 82%¹. For people with disabilities, employment exhibits a central component to establish self-esteem and responsibility, foster social skills and autonomy or to increase participation in the community². Beside employment opportunities like sheltered workshops or supported employment, social firms serve first and foremost as companies on the general labour market in competition to other companies. In Germany, at least 30% up to 50% of people with different kinds of disabilities like mental, physical, sensory, or multiple ones must be employed maintaining an inclusive employment approach with equal participation (§ 215, Book Nine of the German Social Code (SGB IX)). In general, employees are covered by social security and receive agreed wages, wherefore they are seen as equal employees³. Today, more than 900 social firms or departments employ about 13,590 severely disabled people primarily with mental and intellectual disabilities in a wide range of sectors like gastronomy, gardening and landscaping, industrial production or crafts^{4,5}. On an international level, social firms are also called “affirmative businesses, adapted enterprises, cooperatives, collectives [or], consumer/survivor-run businesses”⁶, p. 39 with varying country, legislation, or management characteristics.

When creating inclusive work environments in social firms, several job resources are provided for its employees according to the current state of research⁷. Not only high levels of flexibility^{6 8-22}, organised work tasks^{8-13 15-18 20 21 23-26}, trainings^{6 10 14 16 25} and high levels of job security^{8-11 15 16 18-20 26} are provided, but also social support of co-workers and supervisors^{6 8-31}. However, only limited evidence is reported regarding the working conditions and associated work and health-related outcomes like burnout symptoms or work engagement of supervisors themselves⁷. In social firms, qualified professionals (e.g., chefs or gardeners), specialists for work and career promotion or occupational therapists can work alongside with social pedagogues and provide work-accompanying support of employees with disabilities³². Applied research specifically in the context of social firms is of great relevance, since employees in social work or pedagogy in general are found in the 10 occupational groups with the most days of incapacity to work due to burnout in 2019 (239.8 days per 1,000 insured persons)³³. Burnout is highlighted as feeling physically, emotionally, and mentally exhausted due to an ongoing exposure to challenging work situations³⁴. Kristensen et al. further summarize that “the additional key feature [of the concept burnout] is the *attribution* of fatigue and exhaustion to specific *domains* or spheres in the person’s life. One such domain is *work* and a more specific domain is *client work*”³⁵, p. 197. Partly considered as the opposite, work engagement is described as a fulfilling state of mind regarding one’s work including the dimensions vigour (e.g., as having energy and investing endeavour in work), dedication (e.g., as being enthused or

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3 inspired), and absorption (e.g., as being concentrated in one's work, wherefore time goes by
4 quickly) ³⁶.

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7 When gaining insights into working conditions of supervisors in social firms, first exploratory
8 qualitative studies indicate that supervisors experience specific job demands, such as
9 emotional demands due to a high number of conversations or exposure to present fears and
10 concerns of employees ³⁷. Systematic reviews and meta-analysis on emotional labour when
11 interacting with others while showing or concealing certain emotions provide insights into its
12 influence on well-being or work-related outcomes ^{38 39}. For instance, surface acting (as the
13 adaptation of emotion expression) is associated with emotional exhaustion, depersonalization,
14 mental distress, poorer physical well-being, the intention to quit or a decreased job satisfaction
15 ³⁸. Existing evidence presented for social firms so far highlights that especially in this setting,
16 supervisors not only need to instruct and care for their employees as a social objective of the
17 company, but pursue economic goals when operating a daily business on the general labour
18 market which may result in conflicts between both domains ³⁷. In fact, additional quantitative
19 demands regarding working hours, pace, and workload are underlined for supervisors in social
20 firms ^{8 12 17 18 24 37}. Previous studies from the general labour market indicate that quantitative
21 workloads were significantly linked to an increased mental health risk for supervisors in general
22 ⁴⁰ and to the development of emotional exhaustion ⁴¹⁻⁴³, burnout ⁴⁴⁻⁴⁶ or higher depression
23 scores ⁴⁶ of employees.

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26 On the contrary, supervisors in social firms are provided with several resources according to
27 qualitative exploratory research, such as a high meaning of work, e.g., when employees with
28 mental illnesses acquire more stability ³⁷. Based on the concept from Schnell et al. ⁴⁷ meaning
29 of work can be defined as "coherence, direction, significance, and belonging in the working
30 life" ^{47, p. 4}. Summarizing research outlines positive impacts of work meaningfulness on
31 motivation, organisational commitment, work engagement and job satisfaction as well as
32 negative ones on turnover intentions, burnout, stress, and counterproductive behaviours ^{48 49}.
33 Supervisors in social firms underline also high levels of social support, either from colleagues,
34 management or pedagogical support ³⁷. Within the current state of research, it is also specified
35 that supervisors who feel supported at work report less commonly about negative strain
36 reactions ⁴⁰. The construct of perceived organisational support postulates the extent to which
37 employees perceive their organisation as appreciating their effort and caring about their well-
38 being ⁵⁰. Two psychological mechanisms provide a basis for the construct, including a high
39 level of support of the organisation for the employees' needs and the feeling of belonging to
40 the organization, which in turn leads to a higher level of identification with the organization.
41 Due to the reciprocity to give something back to the organization, a higher work engagement
42 can be assumed ⁵¹. However, supervisors report on receiving slightly less support from
43 superiors or colleagues than employees without a leadership function ⁵². As an additional job

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3 resource of supervisors in social firms influence at work is highlighted in exploratory research
4 ³⁷ which includes job characteristics concerning opportunities to make a decision, the
5 regulation of work content, its sequence and workloads ⁵³. There is evidence that influence at
6 work appears to buffer negative strain reactions in supervisors ⁴⁰. In fact, supervisors seem to
7 have significantly more influence at work in comparison to employees without a management
8 function, since they are more often able to plan and influence their amount of work as well as
9 breaks ⁵².

14 Considering the presented job demands of supervisors in social firms, personal resources can
15 be discussed as mitigating the negative effects of stress. For instance, resilience represents
16 the process of adapting to challenging situations and the ability to bounce back ⁵⁴. The authors
17 Wagnild and Young subdivide resilience into "acceptance of self and life" and "personal
18 competence" ^{54, p. 165}. Previous studies indicate negative relations between resilience and
19 burnout symptoms or perceived stress ^{55 56}, positive ones to work engagement ^{57 58} or examined
20 resilience as a moderator in the relationship between stress and burnout ^{55 59}.

26 Theoretical Background

28 To gain insight into working conditions and personal resources of supervisors in social firms in
29 relation to work and health-related outcomes like burnout symptoms or work engagement, the
30 Job Demands–Resources (JD-R) model developed by Bakker and Demerouti was applied ⁶⁰⁻
31 ⁶². As depicted by the model, job factors depending upon enduring physical or mental effort
32 can be considered as job demands with an exhausting impact (health impairment process).
33 On the contrary, job resources are represented by physical, psychological, social, and
34 organisational factors which promote accomplishing work-related goals, reduce work demands
35 and its related costs, and promote personal growth and development (motivational process).
36 Overall, the effects of the JD-R model are empirically proven, wherefore the model can be
37 applied to predict burnout symptoms and work engagement, which in turn have an impact on
38 organisational performance ⁶⁰⁻⁶².

46 Study Aims

48 Traced back to the presented limited evidence for supervisors in social firms, the study aimed
49 at addressing the knowledge gap on working conditions of supervisors including the
50 associations between supervisors' job demands (quantitative and emotional demands), job
51 resources (meaning of work, perceived organisational support and influence at work), personal
52 resources (resilience) and burnout symptoms as well as work engagement.

56 Therefore, three research questions were stated:

- 58 • Are quantitative and emotional demands related to burnout symptoms and work
59 engagement of supervisors in social firms?
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- Are meaning of work, perceived organisational support and influence at work related to burnout symptoms and work engagement of supervisors in social firms?
- Is resilience related to burnout symptoms and work engagement of supervisors in social firms?

Hypotheses

Referring to the displayed research evidence in combination with the JD-R model, the following hypotheses were developed and displayed in figure 1.

- *Hypothesis 1 (H1)*. Quantitative and emotional demands are associated with supervisors' burnout symptoms (1a) and work engagement (1b).
- *Hypothesis 2 (H2)*. Meaning of work, perceived organisational support and influence at work are associated with supervisors' burnout symptoms (2a) and work engagement (2b).
- *Hypothesis 3 (H3)*. Resilience is associated with supervisors' burnout symptoms (3a) and work engagement (3b).
- *Hypothesis 4 (H4)*. Resilience moderates the relationship between supervisors' quantitative and emotional demands and burnout symptoms.

-----Place figure 1 here-----

Methods

Study Design and Recruitment process

The study was planned as a cross-sectional online survey for supervisors in German social firms (according to § 215, Book Nine of the German Social Code (SGB IX)). Beforehand, a scoping review on working conditions in social firms was conducted⁷, followed by a qualitative study on job demands and resources of German supervisors due to a lack of research on their working conditions³⁷. Identified crucial job demands, resources and outcomes were subsequently tested in the present study. Data was collected between August and November 2021. According to the REHADAT-Portal⁶³, 1014 social firms were potentially eligible for participation from all 16 federal states (Figure 2).

----- Place figure 2 here-----

A total of 650 companies were randomized and contacted via email including leaflets with information on the study. After some weeks, the contacted companies received a reminder. Additionally, an invitation via e-mail was sent to members of the *bag:if* which serves as a representation of interests of social firms in Germany. Within both recruitment processes, managing directors were instructed to forward the survey invitation to direct supervisors within

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3 the company. Overall, participation in the survey was on a voluntary basis. Supervisors were
4 informed about the study, its aims and data protection regulations and provided informed
5 consent when entering the questionnaire. Inclusion criteria for participating in the study were
6 predefined beforehand, including (1) supervisors who are employed in a social firm for at least
7 six months, (2) who work at least 18 hours per week and (3) who are in direct contact with
8 employees. The survey was accessed 191 times, consent was refused by nine supervisors,
9 and 60 participants dropped out (reasons for non-participation could not be traced back due to
10 the study design). Finally, 124 supervisors participated in the online survey. Beforehand, the
11 necessary sample size was calculated by using G*Power 3.1.9.7⁶⁴ based on an effect size of
12 $f^2=0.15$ (medium effect according to Cohen⁶⁵), $\alpha=0.05$, included predictors and a statistical
13 power of $\beta=0.80$, resulting in 103 required participants.

21 Variables

22 *Demographic and work-related Variables*

23 The items sex, age, work experience, work time and number of locations were self-constructed.
24 Professional qualification was adapted based on to the *Mikrozensus*, an annual household
25 survey conducted by official statistics in Germany⁶⁶. The number of subordinate employees
26 was assessed via the Copenhagen Psychosocial Questionnaire (COPSOQ⁶⁷). When
27 examining the size of the company, the definition for micro, small and medium-sized
28 enterprises of the European commission was applied⁶⁸. Gaining insight into the sectors of
29 supervisors of social firms, the most prominent sectors were used⁶⁹ with the possibility to
30 report about other sectors.

37 *Job Demands and Resources*

38 The former described conflict between social and economic objectives of supervisors in social
39 firms was operationalized by means of quantitative and emotional demands. Therefore, scales
40 from COPSOQ were introduced and complemented by those of meaning of work and influence
41 at work⁶⁷. An example of the five-item scale quantitative demands was "How often does it
42 happen that you do not have enough time to complete all your tasks?". Additionally, the
43 perceived burden of setting-specific demands was assessed and rated on a 5-point Likert scale
44 ranging from a very low degree to a very high degree based on emerging results of qualitative
45 analysis of supervisors in social firms in Germany as a complement of standardized
46 instruments³⁷. "Is part of your job to deal with other people's personal problems?" was an
47 example item of the emotional demands two-item-scale. Meaning of work was assessed by
48 using a two-item-scale (e.g., "Do you feel that your work is important?") and influence at work
49 via a three-item scale (e.g., "Do you have much influence over decisions that affect your
50 work?"). For all items a 5-point Likert scale was used and transformed to values from 0
51 (never/almost never/to a very low degree) to 100 (always/to a very high degree)⁶⁷.
52 Psychometric evaluation of all COPSOQ scales indicated positive results⁶⁷.

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3 When examining perceived organisational support an eight-item-scale was used developed by
4 Siebenaler and Fischer providing a Likert scale from 1 (totally disagree) to 7 (totally agree). An
5 example item was “The organization shows very little interest in me.” Since the survey only
6 includes supervisors from social firms, the name (in this case social firm) was directly included
7 in the instruction, as described in the scope of application of the scale ⁷⁰. Perceived
8 organisational support was evaluated as having a high psychometric quality and was validated
9 by supervisors at various hierarchical levels ⁷⁰.

14 Resilience

15 To measure supervisors' resilience, a short form of the Resilience Scale, the RS-13 was
16 included within the questionnaire with 13 items and a 7-point Likert scale (1 = I don't agree, 7
17 = I totally agree). One example item of the scale was “When I am in a difficult situation, I usually
18 find a way out”. Results are divided into low (13-66), moderate (67-72) and high levels of
19 resilience (73-91). The psychometric evaluation of the RS-13 was considered as good in past
20 research ⁷¹.

25 Work Engagement

26 Work engagement was also assessed via the COPSOQ with a three-item-scale (e.g., “In my
27 work I am full of energy”) providing the possibility to choose on a 5-point Likert scale. Likewise
28 the scale was transformed to values ranging from 0 (never/almost never) to 100 (always) ⁶⁷.

32 Burnout symptoms

33 Likewise, burnout symptoms were also used from the COPSOQ which was traced back to the
34 Copenhagen Burnout Inventory. On a 5-Point-Likert scale three items were introduced. An
35 example item of the burnout symptoms scale was “How often are you physically exhausted?”.
36 Like the previous items, the three-item-scale was transformed into values from 0 (never/almost
37 never) to 100 (always) ⁶⁷.

41 Data Analysis

42 Statistical analysis was conducted using the software IBM® SPSS® Statistics (version 25 and
43 28). Since only a little amount of missing data was identified within the final sample (5.6%),
44 listwise deletion was applied to maintain a complete dataset. Initially, descriptive statistics of
45 all variables concerned were displayed. Plausibility checks were run, and data was checked
46 for normal distribution. Shapiro–Wilk test, skewness, and kurtosis as well as histograms partly
47 showed lacking normal distribution justifying the use of a Spearman's rho correlation.
48 Prerequisites for multiple regression analysis were checked, including for instance
49 multicollinearity by reporting variance inflation factor (VIF), the detection of autocorrelation in
50 the residuals by using the Durbin Watson statistics or outliers by looking at cook's distance.
51 The prerequisites of linearity, normal distribution of residuals and homoscedasticity were
52 checked graphically. To analyse predictors of burnout symptoms and work engagement, two
53 hierarchical regression analyses were applied, wherefore the order of variables could be
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determined, and improvements of the model could be observed when adding more factors. Predictors were introduced to the model based on the results of correlation analysis conducted beforehand. To control for heteroscedasticity, robust standard errors were additionally reported by using the HC3 method ⁷². Likewise, two moderation analyses were conducted separately after all main associations were observed to examine the role of resilience in the relationship between demands and burnout symptoms. P-Values of <0.05 were evaluated as significant and were given two tailed. According to Cohen (1988) R² was classified as a small (0.02), medium (0.15), and large (0.35) explained variance ⁶⁵.

Patient and Public involvement

Patients or the public were not involved in the design, conduct, reporting, or dissemination plans of our research.

Ethical considerations

The study was approved by the Ethics Committee of the University Medical Centre Hamburg-Eppendorf, Germany (LPEK-0191). All participants provided informed consent for data collection after receiving information on data protection and analysis.

Results

Most of the 124 participants were male (59.7%) and between 51 and 60 years old (35.5%) (Table 1). Most supervisors had a diploma, bachelor's degree, master's degree, state examination or a teacher's examination (45.2%). Almost half of the participants were employed in the social firm for one to five years (44.4%). 80.6% of participants worked between 31 and 40 hours per week. Most of the participating supervisors worked in hotels, restaurants and gastronomy or in manufacturing companies (41.9% and 23.4%, respectively). One in five supervisors worked in a social firm with more than five locations. 40.3% of supervisors worked in medium-sized social firms with 50 to 249 employees and about one third were responsible for 11 to 20 employees. Mostly they worked with employees with mental disabilities ($n = 101$; 81.5%), intellectual disabilities ($n = 80$; 64.5%), physical disabilities ($n = 91$; 73.4%), sensory disabilities ($n = 86$; 69.4%) or other disabilities ($n = 22$; 17.7%), whereby multiple choices were possible.

Table 1 Participant characteristics ($n = 124$)

Variables	n	%
Sex		
Male	74	59.7
Female	49	39.5
Other	1	0.8
Missing	0	0.0
Age groups		

21-30 years	6	4.8
31-40 years	28	22.6
41-50 years	36	29.0
51-60 years	44	35.5
61-70 years	9	7.3
older than 70 years	1	0.8
Missing	0	0.0
<i>Professional qualification</i>		
Without professional qualification	1	0.8
Apprenticeship, vocational training in the dual system	34	27.4
Master craftsman/technician or equivalent technical college degree	28	22.6
Diploma, bachelor's degree, master's degree, state examination, teacher's examination	56	45.2
Doctorate	3	2.4
Other professional qualification	2	1.6
Missing	0	0.0
<i>Work experiences in the current social firm</i>		
Less than a year	5	4.0
1-5 years	55	44.4
6-10 years	25	20.2
11-15 years	22	17.7
15-20 years	11	8.9
More than 20 years	4	3.2
Missing	2	1.6
<i>Work time</i>		
Less than 20 hours	8	6.5
21-30 hours	10	8.1
31-40 hours	100	80.6
Missing	6	4.8
<i>Sectors</i>		
Hotels, restaurants and gastronomy	52	41.9
Building services	23	18.5
Gardening and landscaping	19	15.3
Manufacturing	29	23.4
Trade	25	20.2
Education and training	1	0.8
Other services	17	13.7
Other sectors	35	28.2
<i>Number of locations</i>		
1	53	42.7
2	18	14.5
3	18	14.5
4	10	8.1
More than 5	24	19.4

Missing	1	0.8
<i>Size of the company</i>		
1-9 employees	6	4.8
10-49 employees	61	49.2
50-249 employees	50	40.3
More than 250 employees	6	4.8
Missing	1	0.8
<i>Subordinate employees</i>		
1-10 employees	20	16.1
11-20 employees	37	29.8
21-30 employees	18	14.5
More than 30 employees	32	25.7
Missing	17	13.7

Notes. *Multiple choice answer.

Table 2 indicates descriptive statistics of the concerned variables including an acceptable reliability of all scales ($\alpha > 0.7$).

Table 2 Descriptive statistics of concerned variables

Variables	M	SD	Min	Max	α
<i>Job demands</i>					
Quantitative demands	57.58	14.77	15	95	0.74
Emotional demands	74.39	17.88	0	100	0.78
<i>Job resources</i>					
Influence at work	71.81	17.25	25	100	0.70
Meaning of work	85.47	14.79	50	100	0.79
Perceived organisational support	5.24	1.24	1.75	7	0.93
<i>Personal resources</i>					
Resilience	75.08	8.03	45	91	0.84
<i>Outcomes</i>					
Work engagement	71.10	15.16	25	100	0.78
Burnout symptoms	48.04	20.83	0	100	0.84

Notes. α = Cronbach's Alpha.

Spearman correlation coefficients were highlighted in table 3. The correlation between quantitative job demands and burnout symptoms was positive and significant. No significant correlation coefficients were observed for quantitative demands and work engagement or for emotional demands and both outcomes. The three job resources each correlated significantly positively with work engagement and significantly negatively with burnout symptoms. Resilience was significantly positively related to work engagement and significantly negatively to burnout symptoms. The correlation between work engagement and burnout symptoms was significant and negative.

Table 3 Spearman correlation.

Variables	1	2	3	4	5	6	7	8
1. Quantitative Demands	-							
2. Emotional Demands	.130	-						
3. Meaning of work	-.016	.245**	-					
4. Perceived organisational support	-.143	.018	.367**	-				
5. Influence at work	-.229*	.066	.272**	.495**	-			
6. Resilience	-.159	.142	.372**	.248**	.404**	-		
7. Work engagement	.014	.139	.476**	.424**	.342**	.312**	-	
8. Burnout symptoms	.323**	.050	-.192*	-.345**	-.235**	-.212*	-.287**	-

Notes. Spearman correlation coefficient: * $p < 0.05$; ** $p < 0.01$.

As depicted in table 4, perceived organisational support was the strongest predictor for burnout symptoms with ca. 10% of explained variance. Within model 2, quantitative job demands were introduced following an increase of 0.059 in R^2 ($p < .01$). In models 3 to 6, no significant changes of R^2 were observed. The complete model 6 with all predictors of burnout symptoms was significant ($F(9, 104) = 3,43, p < .001$) and explained 16.2% of the variance (indicating a medium explained variance⁶⁵). Considering the proposed hypothesis, hypothesis 1a was partly confirmed, since quantitative demands significantly predicted burnout symptoms ($\beta = 0.236, p < .05$). In addition, supervisors reported several setting-specific demands. 123 supervisors highlighted tasks which had to be completed simultaneously (e.g., to deal with employee concerns during times of high work intensity, 76.9%, $n=83$) and frequent work interruptions (e.g., due to employee concerns, 61.3%, $n=76$) as demanding to a high/very high degree. Similarly, about half of the supervisors (46.8%, $n=58$) outlined that compensating for short-term employee absences also represented a demand to a high/very high degree. Other reasons which were rated as demanding to a high/very high degree included an administrative burden (39.6%, $n=49$), or a high number of employees to look after (20.1%, $n=25$).

In the further course of the analysis, hypothesis 2 was also partly confirmed for perceived organisational support ($\beta = -0.217, p < .05$), but not for influence or meaning at work. However, when controlling for heteroscedasticity, lacking significance was observed for perceived organisational support. Hypothesis 3 on resilience as a personal resource can be rejected as well. Likewise, moderation analysis on resilience indicated no significant results leading to the conclusion that resilience did not moderate the relationship between quantitative and emotional demands and burnout symptoms (model fit: $F(10, 103) = 3,17, p < .001$ for quantitative demands and $F(10, 103) = 3,06, p < .01$ for emotional demands without significant changes of R^2). Figure 3 provides an overview of the conceptual model and the standardised coefficients.

-----Place figure 3 here.-----

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3 Additionally, regression analysis of job demands as well as job and personal resources on
4 work engagement provided significant insights (table 5).
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Table 4 Hierarchical regression analysis for burnout symptoms

Burnout symptoms	1			2			3			4			5			6			
	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	
Regression with SE																			
Regression with robust SE																			
Perceived organisational support	-5.594 (-8.606; -2.582)	1.520	-.337***	-4.971 (-7.925; -2.016)	1.490	-.300**	-4.333 (-7.688; -.978)	1.692	-.261*	-4.371 (-7.727; -1.014)	1.693	-.263*	-3.663 (-7.088; -.239)	1.727	-.221*	-3.593 (-7.073; -.113)	1.755	-.217*	
	-5.594 (-9.106; -2.083)	1.772	-.337**	-4.971 (-8.554; -1.388)	1.808	-.300**	-4.333 (-8.837; .171)	2.272	-.261	-4.371 (-8.875; .134)	2.272	-.263	-3.663 (-8.339; 1.006)	2.355	-.221	-3.593 (-8.453; 1.267)	2.451	-.217	
Quantitative Demands				.324 (.095; .552)	.115	.246**	.307 (.074; .540)	.117	.233*	.298 (.064; .531)	.118	.226*	.315 (.083; .547)	.117	.239**	.310 (.075; .546)	.119	.236*	
				.324 (.089; .559)	.118	.246**	.307 (.058; .555)	.125	.233*	.298 (.043; .522)	.129	.226*	.315 (.056; .574)	.131	.239*	.310 (.047; .574)	.133	.236*	
Influence at work							-.096 (-.335; .142)	.120	-.081	-.063 (-.311; .186)	.125	-.053	-.058 (-.304; .188)	.124	-.049	-.063 (-.313; .187)	.126	-.053	
							-.096 (-.364; .171)	.135	-.081	-.063 (-.339; .213)	.139	-.053	-.058 (-.334; .218)	.139	-.049	-.063 (-.350; .224)	.145	-.053	
Resilience										-.234 (-.709; .241)	.240	-.091	-.098 (-.594; .398)	.250	-.038	-.109 (-.614; .396)	.255	-.042	

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										.234 (-.781; .312)	.276	-.091	-.098 (-.673; .477)	.290	-.038	-.109 (-.701; .483)	.298	-.042
Meaning of work													-.221 (-.476; .033)	.129	-.166	-.227 (-.487; .032)	.131	-.170
													-.221 (-.532; .089)	.157	-.166	-.227 (-.556; .102)	.166	-.170
Emotional demands																.027 (-.176; .231)	.102	.025
																.027 (-.259; .314)	.145	.025
n	114			114			114			114			114			114		
R ²	.136			.194			.199			.206			.228			.229		
Adj. R ²	.104			.157			.154			.154			.169			.162		

Notes. * $p < 0.05$; ** $p < 0.01$. *** $p < 0.001$. Controlled for sex, age groups and professional experience. To identify multicollinearity the VIF was analysed (Model 1: 1.058 for perceived organisational support; Model 2: 1.082 for perceived organisational support and 1.028 for quantitative job demands, Model 3: 1.391 for perceived organisational support, 1.063 for quantitative job demands and 1.379 for influence at work, Model 4: 1.392 for perceived organisational support, 1.070 for quantitative job demands, 1.492 for influence at work and 1.148 for resilience; Model 5: 1.475 for perceived organisational support, 1.078 for quantitative job demands, 1.492 for influence at work, 1.276 for resilience; 1.266 for meaning of work; Model 6: 1.509 for perceived organisational support, 1.100 for quantitative job demands, 1.528 for influence at work, 1.312 for resilience, 1.301 for meaning of work and 1.153 for emotional demands). To test for autocorrelation in the residuals the Durbin Watson Test was used (2.097) and Cook's distance to examine outliers (between .000 and .152).

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3 Within the first model, meaning of work was included as the strongest predictor explaining
4 about 20% of its variance. In the next step, perceived organization support was added, leading
5 to an increase of R^2 of 0.078 ($p < 0.001$). For model 3 to 6, neither significant changes in R^2
6 nor significant predictors of work engagement were observed. The complete model 6 with all
7 predictors of work engagement was significant ($F(9, 105) = 6,35, p < 0.001$) and explained
8 about 30% of the variance indicating a large explained variance⁶⁵. As a result, hypothesis 1b
9 on the influence of job demands on work engagement could be rejected. Hypothesis 2b could
10 partly be confirmed, since meaning of work ($\beta = 0.326, p < 0.001$) and perceived organisational
11 support ($\beta = 0.245, p < 0.05$) predicted work engagement of supervisors in social firms (Figure
12 3). As observed for burnout symptoms, when controlling for heteroscedasticity, lacking
13 significance was identified for perceived organisational support. Hypothesis 3 on the personal
14 resource resilience and its effects on work engagement could be rejected.
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Table 5 Hierarchical regression analysis for work engagement

Work engagement	1			2			3			4			5			6			
	B with SE (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	
Regression with SE																			
Regression with robust SE																			
Meaning of work	.449 (.288; .610)	.081	.463***	.362 (.202; .523)	.081	.374***	.348 (.188; .509)	.081	.359***	.317 (.149; .486)	.085	.327***	.319 (.147; .491)	.087	.329** *	.316 (.142; .488)	.087	.326** *	
	.449 (.264; .634)	.093	.463***	.362 (.163; .562)	.101	.374***	.348 (.150; .547)	.100	.359***	.317 (.128; .507)	.096	.327**	.319 (.123; .515)	.099	.329**	.316 (.118; .514)	.100	.326**	
Perceived organisational support				3.650 (1.616; 5.685)	1.026	.301***	2.842 (.577; 5.107)	1.143	.235*	2.963 (.692; 5.234)	1.146	.245*	2.940 (.629; 5.250)	1.165	.243*	2.972 (.653; 5.291)	1.170	.245*	
				3.650 (.341; 6.959)	1.670	.301*	2.842 (-.456; 6.140)	1.664	.235	2.963 (-.332; 6.259)	1.662	.245	2.940 (-.387; 6.267)	1.678	.243	2.972 (-.344; 6.288)	1.672	.245	
Influence at work							.123 (-.033; .278)	.078	.142	.096 (-.065; .258)	.081	.112	.098 (-.066; .261)	.082	.113	.107 (-.059; .274)	.084	.124	
							.123 (-.045; .290)	.085	.142	.096 (-.086; .278)	.092	.112	.098 (-.094; .289)	.097	.113	.107 (-.097; .311)	.103	.124	
Resilience										.192 (-.135; .520)	.165	.103	.195 (-.137; .528)	.168	.104	.209 (-.127; .546)	.170	.112	
							.192 (-.194;	.195	.103	.195 (-.191;	.195	.103	.195 (-.191;	.195	.104	.209 (-.174;	.191	.112	

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										.579)			.582)			.593)			
Emotional demands														-.009 (-.142; .125)	.067	-.011	-.015 (-.150; .120)	.068	-.019
														-.009 (-.163; .146)	.078	-.011	-.015 (-.180; .150)	.083	-.019
Quantitative Demands																	.052 (-.105; .209)	.079	.054
																	.052 (-.113; .217)	.083	.054
n	115			115			115			115			115			115			
R ²	.248			.326			.341			.350			.350			.352			
Adj. R ²	.221			.295			.305			.307			.301			.297			

Notes. * $p < 0.05$; ** $p < 0.01$. *** $p < 0.001$. Controlled for sex, age groups and professional experience. To identify multicollinearity the VIF was analysed (Model 1: 1.022 for meaning of work; Model 2: 1.124 for meaning of work and 1.161 for perceived organisational support; Model 3: 1.138 for meaning of work, 1.459 for perceived organisational support and 1.356 for influence at work; Model 4: 1.263 for meaning of work, 1.471 for perceived organisational support, 1.470 for influence at work and 1.277 for resilience; Model 5: 1.301 for meaning of work, 1.508 for perceived organisational support, 1.495 for influence at work, 1.306 for resilience and 1.128 for emotional demands; Model 6: 1.306 for meaning of work, 1.511 for perceived organisational support, 1.540 for influence at work, 1.327 for resilience, 1.152 for emotional demands and 1.103 for quantitative demands). To test for autocorrelation in the residuals the Durbin Watson Test was used (1.978) and cook's distance to examine outliers (between .000 and .321).

Discussion

Within the current state of research the presented study was one of the first analysing working conditions of supervisors in German social firms working with employees with severe disabilities on the general labour market. Significant relations between job demands and job resources and burnout symptoms or work engagement were presented by using hierarchical regression analysis. Referring to the proposed hypothesis, hypothesis 1a was partly confirmed as quantitative demands significantly predicted burnout symptoms. Likewise, hypothesis 2a on perceived organisational support and its association with burnout symptoms was partly confirmed. Stated hypothesis on work engagement were partly verified as well. Hypothesis 1b referring to job demands and its relation to work engagement was rejected. In contrast, hypothesis 2b was partly confirmed on meaning of work and perceived organisational support. Hypothesis 3 and 4 on the role of resilience as a personal resource were rejected.

Working conditions in relation to burnout symptoms and work engagement

When referring to job demands of supervisors in social firms, previous studies postulate a conflict between social and economic goals in social firms for supervisors when operating a daily business on the general labour market^{8 12 17 18 24 37}. Therefore, working conditions were operationalized in the present study by means of quantitative and emotional demands. It was shown that only quantitative job demands were related to burnout symptoms of supervisors in social firms. These findings differ only to a limited extent, e.g., from supervisors in general⁴⁰, or from professionals in sheltered workshops⁷³. However, descriptive complements underlined task-specific factors and peculiarities for this setting. For instance, challenges like high workloads due to staff shortages⁷⁴ or work absences of employees due to mental health conditions which must be intercepted by the supervisor at short notice³⁷ were replicated as setting-specific demands of supervisors. Approaches to buffer quantitative demands are presented in recent qualitative results, calling for the support of non-disabled colleagues in the social firms department³⁷.

With regard to emotional demands, assumed relations to burnout symptoms or work engagement could not be replicated leading to the conclusion that emotional demands are either perceived as less challenging or that sufficient support is already provided, e.g., by social pedagogies or specialists in work and career promotion. Though, perceived emotional demands of supervisors appeared much higher on a descriptive level in comparison to other occupations ($M=74.39$ for supervisors in social firms vs. $M=52$ for other occupations⁷⁵), wherefore more differentiated insights are needed. For instance, recent qualitative results inform about present fears and concerns of employees with disabilities in social firms, e.g. due to private problems³⁷. Therefore, cross-sectoral partnerships are suggested by other authors when allying both company objectives – not only due to challenges when finding skilled staff but also for improving social and pedagogical support of supervisors¹².

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5 With regard to job resources, perceived organisational support was presented as a crucial
6 resource impacting both burnout symptoms and work engagement, supporting the theory of
7 organisational support⁵¹. Though, both associations remained non-significant when controlling
8 for heteroscedasticity. Similar tendencies are found by Zimber et al.⁴⁰ for supervisors in
9 general stating social support as a central resource buffering mental strain reactions and by
10 Schwangler et al.⁷⁶ on low levels of appreciation at work (OR: 2.72; $p < 0.01$; 95%- CI: 1.32-
11 5.58) as increasing the risk of burnout. Likewise, results using the same construct to assess
12 perceived organisational support concur to influence emotional exhaustion and
13 depersonalization in disability support staff⁷⁷.

14
15 For the second job resource meaning of work, associations with work engagement were
16 evaluated. Beforehand, additional impacts of meaning of work on burnout were assumed^{48 49}
17 which could not be replicated in the present study. Prior qualitative results on supervisors of
18 social firms present a high perceived meaning of work when employees made progress and
19 gained more stability or improved language and motor skills. An attributed meaning of work is
20 also stated in comparison to other settings of the general labour market³⁷ which was also
21 underlined by descriptive statistics of the current study ($M=85.47$ for supervisors in social firms
22 vs. $M=75$ of other occupations⁷⁵).

23
24 Contrary to previous research, influence at work was neither evaluated as associated with
25 burnout symptoms nor work engagement. However, prior qualitative results highlight the
26 supervisors ability to influence their workload as well as decision-making processes as
27 important resources³⁷. In general, supervisors are described as having significantly more
28 latitude in decision-making in comparison to employees without a management function⁵².
29 Those differences were also apparent when comparing means of supervisors regarding their
30 influence at work ($M=71.81$) to other occupations ($M=42$)⁷⁵.

41 42 43 Personal resources in relation to burnout symptoms and work engagement

44
45 Adverse to postulated hypotheses and results of previous studies⁵⁵⁻⁵⁹, present findings
46 indicated that resilience was neither associated with burnout symptoms nor with work
47 engagement. However, correlation analysis was in line with our hypothesis highlighting
48 significant associations to work engagement and burnout symptoms. Nevertheless, when
49 introduced into the regression model, results were evaluated as non-significant leading to the
50 conclusion that working conditions appear as stronger predictors of burnout symptoms and
51 work engagement in comparison to resilience. Likewise, no moderating effects of resilience
52 were examined, which could be interpreted as quantitative demands were linked to burnout
53 irrespective of supervisors' levels of resilience and underlining the health impairment process
54 proposed by the JD-R model⁶⁰⁻⁶². According to the RS-13, supervisors in general were
55 characterised as having high levels of resilience indicating that they were able to adapt to
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3 challenging or adverse situations. Though, recent results emphasize that even with high levels
4 of resilience, individuals are still subject to burnout symptoms as resilience may offer protection
5 to some extent, but not full prevention ⁷⁸.

8 Implications for policy and practice

9
10 Overall, the results obtained provide important information for practice, which can not only be
11 used by companies in the context of psychosocial risk assessment but can also provide starting
12 points for the development of interventions for workplace health promotion adapted for
13 supervisors in social firms (e.g., ⁷⁹). It is recommended to combine both structural and
14 behavioural interventions to address supervisors' working conditions and own behaviour ⁸⁰. On
15 the one hand, structural approaches may reduce supervisors' quantitative demands, which
16 had according to present findings direct effects on burnout symptoms. In this context, a
17 reduction of time pressure, diminished workloads, higher staff ratios or more support by non-
18 disabled colleagues should be taken into consideration. Likewise, perceived organisational
19 support of supervisors should be addressed including interest in supervisors and their opinions,
20 goals, well-being, and job satisfaction, appreciation, and support in challenging situations ⁷⁰.
21 In order to increase and emphasize supervisors' meaning of work (which was evaluated as
22 associated with work engagement) and to reflect on their achievements like progress among
23 employees, elevated skills, independence, or stability team meetings or workshops could be
24 used. On the other hand, regardless of our results but in line with other studies, behavioural
25 approaches should be added, e.g., resilience trainings that strengthen supervisors' personal
26 resources and in turn increase work engagement ⁸¹. In general, results are also relevant not
27 only for strengthening supervisors' health and productivity but also to enable them to provide
28 appropriate support for their employees ⁸².

29
30 When implementing health promotion interventions and a culture of health, especially
31 managing directors of social firms should recognize themselves as important key players. In
32 general, since social firms are mainly considered as small and medium-sized companies ⁸³
33 which often operate in more than five locations (19.4% in the present sample), cooperation
34 and regional partnerships for workplace health promotion for pooling resources, promoting
35 networking and exchange, and receiving technical and financial support, e.g., by social
36 insurance institutions, are recommended ⁸⁴.

51 Implications for future research

52
53 When classifying the study with the current state of research, it became apparent that various
54 subject areas or research designs in the context of social firms are not applied yet. Future
55 research should focus on longitudinal studies with larger sample sizes gaining insights into
56 causal relationships between job demands, resources and work and health-related outcomes
57 of supervisors in social firms. Due to identified parallels to supervisors from other sectors,
58 further comparative studies *between* supervisors in social firms and supervisors from other
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3 sectors might be a useful complementary approach as well as comparisons *within* predominant
4 sectors and tasks of supervisors in social firms. The development of new or adapted
5 instruments to assess peculiarities in the setting could also provide a starting point for further
6 research. Moreover, effects of emotional demands should be examined more differentiated or
7 other job demands, like physical ones, could also be included, as they have shown an
8 increased risk for burnout in studies from related settings⁷⁶. When focussing on the prevention
9 of burnout, future studies could also gain insights into modifiable factors at work. For instance,
10 ways to distribute tasks or to organize work which are perceived as less straining can be
11 discussed as a complement to individual stress reduction approaches, especially when
12 concerned persons have narrow energy resources⁸⁵. Other questions in the context of burnout
13 remain open⁸⁵, e.g., due to different conceptualizations without providing threshold values
14 indicating a clinical disease. Moreover, results mostly rely on the self-reported appraisals of
15 participants without providing complementary approaches in applied methods⁸⁵.

16 Likewise, ongoing COVID-19 pandemic-related influences on social firms can be included in
17 future studies⁸⁶. Another field of research which can also be investigated is represented by
18 role model function of supervisors and the impact of health-oriented leadership on work- and
19 health-related outcomes of employees with disabilities⁸². Lastly, further research may consider
20 the evaluation of workplace health promotion interventions in social firms or cooperation
21 approaches between small and medium-sized companies in this context.

22 Strengths and limitations

23 The study underlined the relevance of gaining insights into working conditions and work and
24 health-related outcomes of supervisors of social firms in Germany. A strength of the study was
25 the systematic and randomized recruitment process of social firms. Well-validated instruments
26 were applied, and participants provided predominantly fully completed questionnaires.
27 However, setting or task-specific factors and peculiarities for supervisors were only covered to
28 a limited extent by the applied validated constructs. Additionally, the cross-sectional design of
29 the study did not allow causal conclusions. Data was collected by using self-report measures
30 of independent and dependent variables in the same measurement context, which might
31 biased our results and introduced common method bias⁸⁷. Furthermore, a possible selection
32 bias cannot be ruled out, either due to voluntary participation, so that individuals with certain
33 characteristics are more likely to participate in the study, or due to non-response, wherefore
34 participants with a certain characteristic drop out of the study or do not participate at all.
35 Likewise, the population in which the online survey was distributed cannot be described⁸⁸,
36 since managing directors were instructed to forward the survey. Therefore, representativeness
37 for all social firms in Germany cannot be expected. Lastly, an influence of the COVID-19
38 pandemic and the resulting changes in working conditions in social firms may have affected
39 the results of the study. Explorative results underlined that at the beginning of 2020, employees
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3 reported fears of an infection with SARS-CoV-2, e.g., due to comorbidities and a lack of
4 routines, which affected especially employees with mental illnesses. Likewise, a sudden loss
5 of work was perceived as stressful resulting in boredom, a lack of exercise, and social contacts.
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7 Therefore, supervisors had to deal with less staffing, the interception of work and economic
8 impacts for the social firm ⁸⁶.
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11 Conclusion

12 The results were one of the first gaining insights into working conditions and its associated
13 outcomes of supervisors in German social firms providing people with disabilities employment
14 on the general labour market. Offered results mainly resonated with the proposed associations
15 according to the JD-R model. Although working conditions differed only to a limited extent from
16 those of other supervisors, setting-specific demands were presented providing starting points
17 for psychosocial risk assessment or the development of interventions for workplace health
18 promotion. Those interventions should mainly focus on reducing quantitative demands and
19 strengthen perceived organisational support of supervisors to promote work engagement and
20 reduce burnout symptoms. Likewise, a high meaning of work should be emphasized. Lastly it
21 should be noted that the consideration of the supervisors working conditions enables both, a
22 promotion of their own health and productivity, and the provision of appropriate support for
23 their employees with disabilities.
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Declarations

Data availability statement

The datasets analysed during the current study are not publicly available due to German national data protection regulations.

Competing interests

The authors declare that they have no competing interests.

Patient consent for publication

Not applicable.

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Authors' contributions

All authors conceived of the study and participated in its design. ACK, IE, VH and SM designed the online survey. ACK recruited supervisors of social firms, conducted statistical analyses, and drafted the manuscript. IE, VH and SM contributed to data interpretation and to the revision of the manuscript. All authors read and approved the final version of the manuscript.

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Figure legends

Figure 1

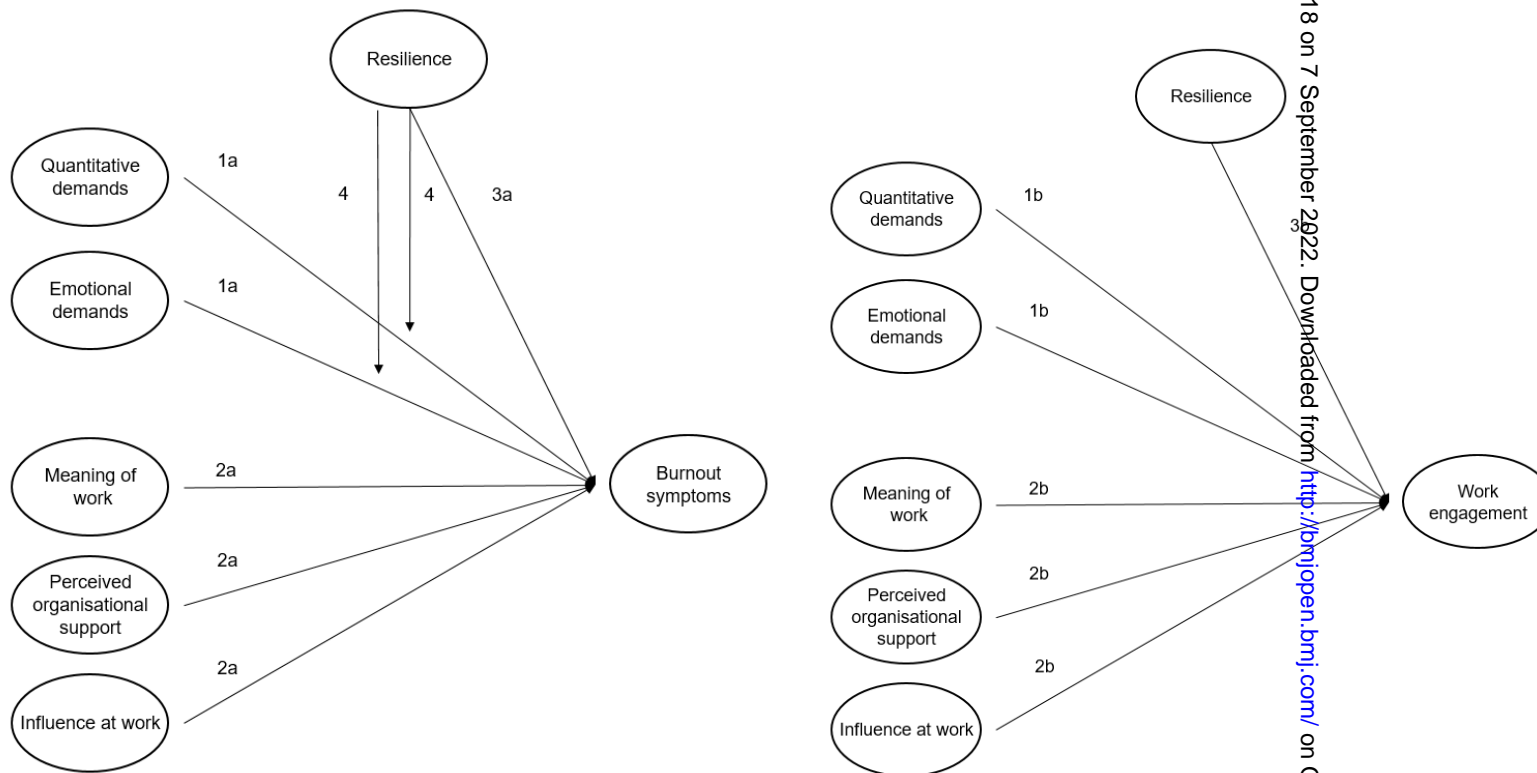
Conceptual model of the study with displayed hypothesis.

Figure 2

Recruitment process of the study.

Figure 3

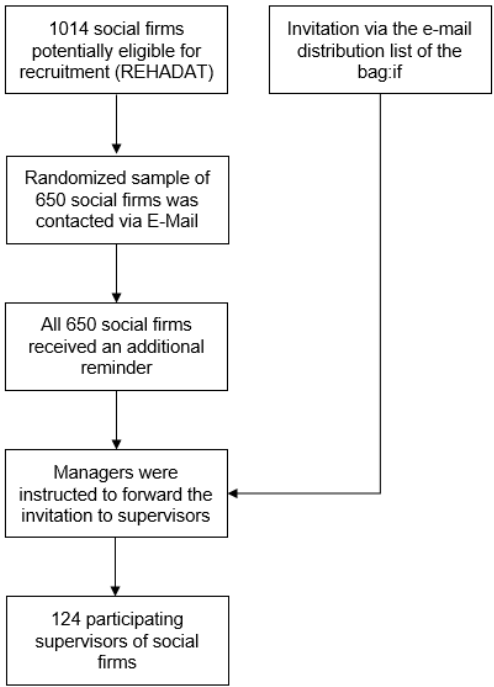
Conceptual model of the study with standardized beta-coefficients * $p < 0.05$; ** $p < 0.01$. ***
 $p < 0.001$. Controlled for sex, age groups and work experience in the current social firm.



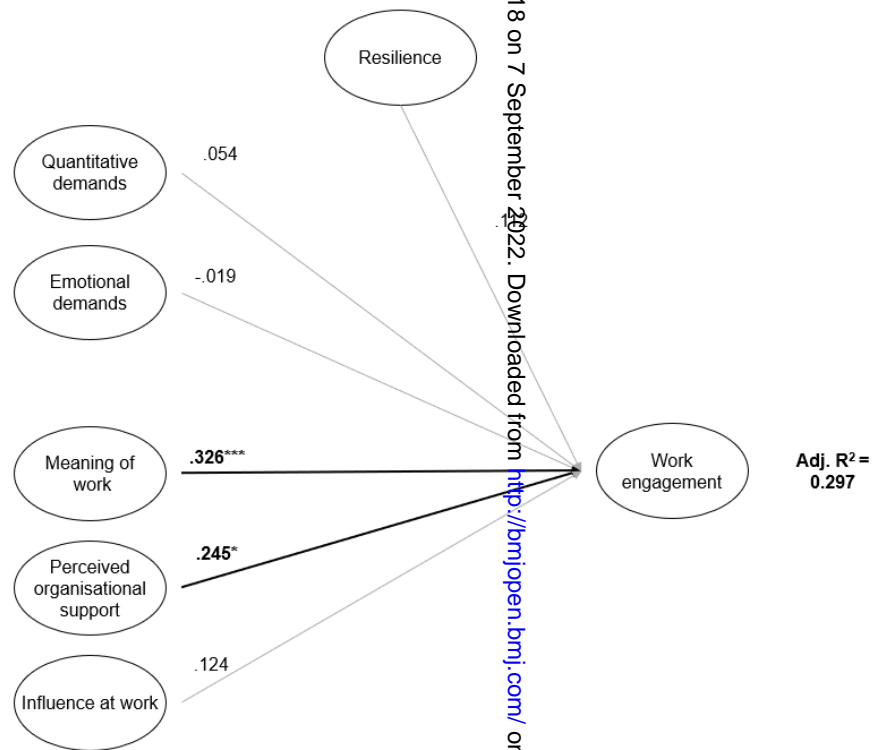
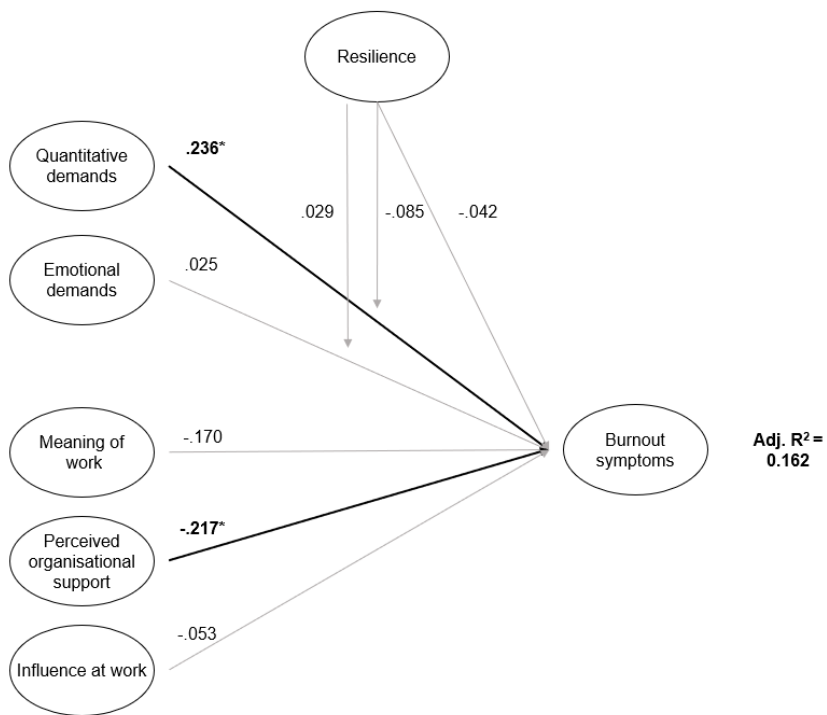
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STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of cross-sectional studies

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	<u>3-4-6</u>
Objectives	3	State specific objectives, including any prespecified hypotheses	<u>5-6-7</u>
Methods			
Study design	4	Present key elements of study design early in the paper	<u>7-6</u>
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	<u>7-8-6</u>
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	<u>7-8-6</u>
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	<u>8-9-6-8</u>
Data sources/measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	<u>8-9-6-8</u>
Bias	9	Describe any efforts to address potential sources of bias	<u>9-10-8</u>
Study size	10	Explain how the study size was arrived at	<u>8-6</u>
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	<u>9-10-8</u>
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	<u>9-10-8</u>
		(b) Describe any methods used to examine subgroups and interactions	Not applicable
		(c) Explain how missing data were addressed	<u>9-10</u>
		(d) If applicable, describe analytical methods taking account of sampling strategy	Not applicable
		(e) Describe any sensitivity analyses	Not applicable
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	<u>86</u>
		(b) Give reasons for non-participation at each stage	Not applicable
		(c) Consider use of a flow diagram	<u>76</u>
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	<u>8-10</u> 10-12
		(b) Indicate number of participants with missing data for each variable of interest	<u>10-12</u> 9-10
Outcome data	15*	Report numbers of outcome events or summary measures	<u>12</u> 10
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	<u>15-19</u> 13-14
		(b) Report category boundaries when continuous variables were categorized	Not applicable
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not applicable
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Not applicable
Discussion			
Key results	18	Summarise key results with reference to study objectives	<u>15</u> 20
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	<u>23-24</u> 18
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	<u>20-24</u> 18
Generalisability	21	Discuss the generalisability (external validity) of the study results	<u>23-24</u> 18
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	<u>25</u> 19

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

Job demands and resources related to burnout symptoms and work engagement in supervisors working with people with severe disabilities in social firms: a cross-sectional study

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3 **Job demands and resources related to burnout symptoms and work engagement in**
4 **supervisors working with people with severe disabilities in social firms: a cross-**
5 **sectional study**
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Abstract

Objectives: To analyse working conditions, work and health-related outcomes of supervisors working with people with severe disabilities in social firms.

Design: Cross-sectional survey.

Setting: Social firms who employ between 30% and 50% severely disabled people with different types of disabilities on the general labour market.

Participants: Supervisors of social firms in Germany.

Primary outcome measures: Descriptive, bi- and multivariate analysis was used to analyse relations between job demands (quantitative and emotional demands), job resources (meaning of work, perceived organisational support and influence at work), personal resources (resilience) and burnout symptoms as well as work engagement. Validated scales, e.g., from the Copenhagen Psychosocial Questionnaire (COPSOQ), were applied.

Results: 124 supervisors of social firms in Germany (59.7% were male and 39.5% female) participated within a cross-sectional quantitative online survey. Multiple hierarchical regression analysis indicated an association of quantitative job demands ($\beta = .236$, $p < .05$) and perceived organisational support ($\beta = -.217$, $p < .05$) and burnout symptoms of supervisors in social firms. Meaning of work ($\beta = .326$, $p < .001$) and perceived organisational support ($\beta = .245$, $p < .05$) were significantly associated with work engagement.

Conclusions: Our study specified main job demands and resources for supervisors in German social firms and their impact on both burnout symptoms and work engagement. When designing measures for workplace health promotion in social firms, especially supervisors' quantitative job demands need to be reduced and perceived organisational support strengthened.

Keywords: health promotion, leadership, occupational health, social enterprises, social firms, working conditions

Strengths and limitations:

- The study was the first providing insights into working conditions, work, and health-related outcomes of supervisors of social firms in Germany to develop recommendations for action on workplace health promotion.
- A strength of the study was the recruitment process of social firms via the REHADAT-Portal providing a list of social firms in Germany, the use of well-validated instruments and setting-specific complements.

- Limitations of the study resulted from the cross-sectional design restricting causal conclusions and the use of an online survey allowing no descriptions of the population in which the survey was distributed.
- Likewise, a possible selection bias could not be ruled out, e.g., due to voluntary participation of supervisors or due to non-response of participants with certain characteristics.

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Background

In 2019, about 7.6 million severely disabled people lived in Germany, whereof 57% were integrated into the labour market or looked for a job. For comparison purposes, the employment rate of non-disabled people was about 82%¹. For people with disabilities, employment exhibits a central component to establish self-esteem and responsibility, foster social skills and autonomy or to increase participation in the community². Beside employment opportunities like sheltered workshops or supported employment, social firms serve first and foremost as companies on the general labour market in competition to other companies. In Germany, at least 30% up to 50% of people with different kinds of disabilities like mental, physical, sensory, or multiple ones must be employed maintaining an inclusive employment approach with equal participation (§ 215, Book Nine of the German Social Code (SGB IX)). In general, employees are covered by social security and receive agreed wages, wherefore they are seen as equal employees³. Today, more than 900 social firms or departments employ about 13,590 severely disabled people primarily with mental and intellectual disabilities in a wide range of sectors like gastronomy, gardening and landscaping, industrial production or crafts^{4,5}. On an international level, social firms are also called “affirmative businesses, adapted enterprises, cooperatives, collectives [or], consumer/survivor-run businesses”⁶, p. 39 with varying country, legislation, or management characteristics.

When creating inclusive work environments in social firms, several job resources are provided for their employees according to the current state of research⁷. Not only high levels of flexibility^{6 8-22}, organised work tasks^{8-13 15-18 20 21 23-26}, trainings^{6 10 14 16 25} and job security^{8-11 15 16 18-20 26} are provided, but also social support of co-workers and supervisors^{6 8-31}. However, only limited evidence is reported regarding the working conditions and associated work and health-related outcomes like burnout symptoms or work engagement of supervisors themselves⁷. In social firms, qualified professionals (e.g., chefs or gardeners), specialists for work and career promotion or occupational therapists can work alongside social pedagogues and provide work-accompanying support of employees with disabilities³². Applied research specifically in the context of social firms is of great relevance, since employees in social work or pedagogy in general are found in the ten occupational groups with the most days of incapacity to work due to burnout in 2019 (239.8 days per 1,000 insured persons)³³. Burnout is highlighted as feeling physically, emotionally, and mentally exhausted due to an ongoing exposure to challenging work situations³⁴. Kristensen et al. further summarize that “the additional key feature [of the concept burnout] is the *attribution* of fatigue and exhaustion to specific *domains* or spheres in the person’s life. One such domain is *work* and a more specific domain is *client work*”³⁵, p. 197. Partly considered as the opposite, work engagement is described as a fulfilling state of mind regarding one’s work including the dimensions vigour (e.g., as having energy and investing

endeavour in work), dedication (e.g., as being enthused or inspired), and absorption (e.g., as being concentrated in one's work, wherefore time goes by quickly) ³⁶.

When gaining insights into working conditions of supervisors in social firms, first exploratory qualitative studies indicate that supervisors experience specific job demands, such as emotional demands due to a high number of conversations or exposure to present fears and concerns of employees ³⁷. Systematic reviews and meta-analyses on emotional labour when interacting with others while showing or concealing certain emotions provide insights into its influence on well-being or work-related outcomes ^{38 39}. For instance, surface acting (as the adaptation of emotion expression) is associated with emotional exhaustion, depersonalization, mental distress, poorer physical well-being, the intention to quit or a decreased job satisfaction ³⁸. Existing evidence presented for social firms so far highlights that especially in this setting, supervisors do not only need to instruct and care for their employees as a social objective of the company, but also pursue economic goals when operating a daily business on the general labour market which may result in conflicts between both domains ³⁷. In fact, additional quantitative demands regarding working hours, pace, and workload are underlined for supervisors in social firms ^{8 12 17 18 24 37}. Previous studies of the general labour market indicate that quantitative workloads were significantly linked to an increased mental health risk for supervisors in general ⁴⁰ and to the development of emotional exhaustion ⁴¹⁻⁴³, burnout ⁴⁴⁻⁴⁶ or higher depression scores ⁴⁶ of employees.

Additionally, supervisors in social firms are provided with several resources according to qualitative exploratory research, such as a high meaning of work, e.g., when employees with mental illnesses acquire more stability ³⁷. Based on the concept from Schnell et al. ⁴⁷ meaning of work can be defined as "coherence, direction, significance, and belonging in the working life" ^{47, p. 4}. Summarizing meta-analyses outline positive impacts of work meaningfulness on motivation, organisational commitment, work engagement and job satisfaction as well as negative ones on turnover intentions, burnout, stress, and counterproductive behaviours ^{48 49}. Supervisors in social firms report also high levels of social support, either from colleagues, management or pedagogical support ³⁷. Within the current state of research, it is also specified that supervisors who feel supported at work report less commonly about negative strain reactions ⁴⁰. The construct of perceived organisational support postulates the extent to which employees perceive their organisation as appreciating their effort and caring about their well-being ⁵⁰. Two psychological mechanisms provide a basis for the construct, including a high level of support of the organisation for the employees' needs and the feeling of belonging to the organisation, which in turn leads to a higher level of identification with the organisation. Due to the reciprocity to give something back to the organisation, a higher work engagement can be assumed ⁵¹. However, supervisors report on receiving slightly less support from superiors or colleagues than employees without a leadership function ⁵². As an additional job

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3 resource of supervisors in social firms their influence on decisions, work content, its sequence
4 and workloads is highlighted in exploratory research ^{37 53}. There is evidence that influence at
5 work appears to buffer negative strain reactions in supervisors ⁴⁰. In fact, supervisors seem to
6 have significantly more influence at work in comparison to employees without a management
7 function, since they are more often able to plan and influence their amount of work as well as
8 breaks ⁵².

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13 Considering the presented job demands of supervisors in social firms, personal resources can
14 also be discussed as mitigating the negative effects of stress. For instance, resilience
15 represents the process of adapting to challenging situations and the ability to bounce back ⁵⁴.
16 The authors Wagnild and Young subdivide resilience into "acceptance of self and life" and
17 "personal competence" ^{54, p. 165}. Previous studies indicate negative relations between resilience
18 and burnout symptoms or perceived stress ^{55 56}, positive ones to work engagement ^{57 58} or
19 examined resilience as a moderator in the relationship between stress and burnout ^{55 59}.

24 Theoretical Background

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26 To gain insight into working conditions and personal resources of supervisors in social firms in
27 relation to work and health-related outcomes like burnout symptoms or work engagement, the
28 Job Demands–Resources (JD-R) model developed by Bakker and Demerouti was applied ⁶⁰⁻
29 ⁶². As depicted by the model, job factors depending upon enduring physical or mental effort
30 can be considered as job demands with an exhausting impact (health impairment process).
31 On the contrary, job resources are represented by physical, psychological, social, and
32 organisational factors which promote accomplishing work-related goals, reduce work demands
33 and its related costs, and promote personal growth and development (motivational process).
34 Overall, the effects of the JD-R model are empirically proven, wherefore the model can be
35 applied to predict burnout symptoms and work engagement, which in turn have an impact on
36 organisational performance ⁶⁰⁻⁶².

44 Study Aims

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46 Traced back to the presented limited evidence for supervisors in social firms, the study aimed
47 at addressing the knowledge gap on working conditions of supervisors including the
48 associations between supervisors' job demands (quantitative and emotional demands), job
49 resources (meaning of work, perceived organisational support and influence at work), personal
50 resources (resilience) and burnout symptoms as well as work engagement.

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52 Therefore, three research questions were stated:

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57 • Are quantitative and emotional demands related to burnout symptoms and work
58 engagement of supervisors in social firms?
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- Are meaning of work, perceived organisational support and influence at work related to burnout symptoms and work engagement of supervisors in social firms?
- Is resilience related to burnout symptoms and work engagement of supervisors in social firms?

Hypotheses

Referring to the displayed research evidence in combination with the JD-R model, the following hypotheses were developed and displayed in figure 1.

- *Hypothesis 1 (H1)*. Quantitative and emotional demands are associated with supervisors' burnout symptoms (1a) and work engagement (1b).
- *Hypothesis 2 (H2)*. Meaning of work, perceived organisational support and influence at work are associated with supervisors' burnout symptoms (2a) and work engagement (2b).
- *Hypothesis 3 (H3)*. Resilience is associated with supervisors' burnout symptoms (3a) and work engagement (3b).
- *Hypothesis 4 (H4)*. Resilience moderates the relationship between supervisors' quantitative and emotional demands and burnout symptoms.

-----Place figure 1 here-----

Methods

Study Design and Recruitment process

The study was planned as a cross-sectional online survey for supervisors in German social firms (according to § 215, Book Nine of the German Social Code (SGB IX)). Beforehand, a scoping review on working conditions in social firms was conducted⁷, followed by a qualitative study on job demands and resources of German supervisors due to a lack of research on their working conditions³⁷. Identified crucial job demands, resources and outcomes were subsequently tested in the present study. Data was collected between August and November 2021. According to the REHADAT-Portal⁶³, 1014 social firms were potentially eligible for participation from all 16 federal states (Figure 2).

----- Place figure 2 here-----

A total of 650 companies were randomised and contacted via email including leaflets with information on the study. After some weeks, the contacted companies received a reminder. Additionally, an invitation via e-mail was sent to members of the *bag:if* which serves as a representation of interests of social firms in Germany. Within both recruitment processes, managing directors were instructed to forward the survey invitation to direct supervisors within

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3 the company. Overall, participation in the survey was on a voluntary basis. Supervisors were
4 informed about the study, its aims and data protection regulations and provided informed
5 consent when entering the questionnaire. Inclusion criteria for participating in the study were
6 predefined beforehand, including (1) supervisors who are employed in a social firm for at least
7 six months, (2) who work at least 18 hours per week and (3) who are in direct contact with
8 employees. The survey was accessed 191 times, consent was refused by nine supervisors,
9 and 58 participants dropped out (reasons for non-participation could not be traced back due to
10 the study design). Finally, 124 supervisors participated in the online survey. Beforehand, the
11 necessary sample size was calculated by using G*Power 3.1.9.7⁶⁴ based on an effect size of
12 $f^2=0.15$ (medium effect according to Cohen⁶⁵), $\alpha=.05$, included predictors and a statistical
13 power of $\beta=.80$, resulting in $n=103$ required participants.

21 Variables

22 *Demographic and work-related Variables*

23 The items sex, age, work experience, work time and number of locations were self-constructed.
24 Professional qualification was adapted based on to the *Mikrozensus*, an annual household
25 survey conducted by official statistics in Germany⁶⁶. The number of subordinate employees
26 was assessed via the Copenhagen Psychosocial Questionnaire (COPSOQ⁶⁷). When
27 examining the size of the company, the definition for micro, small and medium-sized
28 enterprises of the European commission was applied⁶⁸. Gaining insight into the sectors of
29 supervisors of social firms, the most prominent sectors were used⁶⁹ with the possibility to
30 report about other sectors.

37 *Job Demands and Resources*

38 The former described conflict between social and economic objectives of supervisors in social
39 firms was operationalized by means of quantitative and emotional demands. Therefore, scales
40 from COPSOQ were introduced and complemented by those of meaning of work and influence
41 at work⁶⁷. An example of the five-item scale for quantitative demands was "How often does it
42 happen that you do not have enough time to complete all your tasks?". Additionally, the
43 perceived burden of setting-specific demands was assessed and rated on a 5-point Likert scale
44 ranging from a very low degree to a very high degree based on emerging results of qualitative
45 analysis of supervisors in social firms in Germany as a complement to standardized
46 instruments³⁷. "Is part of your job to deal with other people's personal problems?" was an
47 example item of the emotional demands two-item-scale. Meaning of work was assessed by
48 using a two-item scale (e.g., "Do you feel that your work is important?") and influence at work
49 via a three-item scale (e.g., "Do you have much influence over decisions that affect your
50 work?"). For all items a 5-point Likert scale was used and transformed to values from 0
51 (never/almost never/to a very low degree) to 100 (always/to a very high degree)⁶⁷.
52 Psychometric evaluation of all COPSOQ scales indicated positive results⁶⁷.

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3 When examining perceived organisational support an eight-item-scale was used developed by
4 Siebenaler and Fischer providing a Likert scale from 1 (totally disagree) to 7 (totally agree). An
5 example item was “The organisation shows very little interest in me.” Since the survey only
6 includes supervisors from social firms, the name (in this case social firm) was directly included
7 in the instruction, as described in the scope of application of the scale ⁷⁰. Perceived
8 organisational support was evaluated as having a high psychometric quality and was validated
9 by supervisors at various hierarchical levels ⁷⁰.

14 Resilience

15 To measure supervisors' resilience, a short form of the Resilience Scale, the RS-13 was
16 included within the questionnaire with 13 items to be answered on a 7-point Likert scale (1=I
17 don't agree, 7=I totally agree). One example item of the scale was “When I am in a difficult
18 situation, I usually find a way out”. Results are divided into low (13-66), moderate (67-72) and
19 high levels of resilience (73-91). The psychometric evaluation of the RS-13 was considered as
20 good in past research ⁷¹.

25 Work Engagement

26 Work engagement was also assessed via the COPSOQ with a three-item-scale (e.g., “In my
27 work I am full of energy”) providing the possibility to choose on a 5-point Likert scale. Likewise
28 the scale was transformed to values ranging from 0 (never/almost never) to 100 (always) ⁶⁷.

32 Burnout symptoms

33 Likewise, burnout symptoms were also used from the COPSOQ which was traced back to the
34 Copenhagen Burnout Inventory. On a 5-Point-Likert scale three items were introduced. An
35 example item of the burnout symptoms scale was “How often are you physically exhausted?”.
36 Like the previous items, the three-item-scale was transformed into values from 0 (never/almost
37 never) to 100 (always) ⁶⁷.

41 Data Analysis

42 Statistical analysis was conducted using the software IBM® SPSS® Statistics (version 28).
43 Since only a little amount of missing data was identified within the final sample (5.6%), listwise
44 deletion was applied to maintain a complete dataset. Initially, descriptive statistics of all
45 variables concerned were displayed. Plausibility checks were run, and data was checked for
46 normal distribution. Shapiro–Wilk test, skewness, and kurtosis as well as histograms partly
47 showed lacking normal distribution indicating the use of a Spearman's rho correlation.
48 Prerequisites for multiple regression analysis were checked, including for instance
49 multicollinearity by reporting variance inflation factor (VIF), the detection of autocorrelation in
50 the residuals by using the Durbin Watson statistics or outliers by looking at cook's distance.
51 The prerequisites of linearity, normal distribution of residuals and homoscedasticity were
52 checked graphically. To analyse predictors of burnout symptoms and work engagement, two
53 hierarchical regression analyses were applied, wherefore the order of variables could be
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determined, and improvements of the model could be observed when adding more factors. Predictors were introduced to the model based on the results of correlation analysis conducted beforehand. To control for heteroscedasticity, robust standard errors were additionally reported by using the HC3 method⁷². Likewise, two moderation analyses were conducted separately after all main associations were observed to examine the role of resilience in the relationship between demands and burnout symptoms by using centred interaction terms of concerned variables. P-Values of <.05 were evaluated as significant and were given two-tailed. According to Cohen (1988) R² was classified as a small (.02), medium (.15), and large (.35) explained variance⁶⁵.

Patient and Public involvement

Patients or the public were not involved in the design, conduct, reporting, or dissemination plans of our research.

Ethical considerations

The study was approved by the Ethics Committee of the University Medical Centre Hamburg-Eppendorf, Germany (LPEK-0191). All participants provided informed consent for data collection after receiving information on data protection and analysis.

Results

Most of the 124 participants were male (59.7%) and between 51 and 60 years old (35.5%) (Table 1). Most supervisors had a diploma, bachelor's degree, master's degree, state examination or a teacher's examination (45.2%). Almost half of the participants were employed in the social firm for one to five years (44.4%). 80.6% of participants worked between 31 and 40 hours per week. Most of the participating supervisors worked in hotels, restaurants, and gastronomy (41.9%) or in manufacturing companies (23.4%). One in five supervisors worked in a social firm with more than five locations. 40.3% of supervisors worked in medium-sized social firms with 50 to 249 employees and about one third were responsible for 11 to 20 employees. Mostly they worked with employees with mental disabilities ($n = 101$; 81.5%), intellectual disabilities ($n = 80$; 64.5%), physical disabilities ($n = 91$; 73.4%), sensory disabilities ($n = 86$; 69.4%) or other disabilities ($n = 22$; 17.7%), whereby multiple choices were possible.

Table 1 Participant characteristics ($n = 124$)

Variables	n	%
Sex		
Male	74	59.7
Female	49	39.5
Other	1	0.8
Missing	0	0.0
Age groups		

21-30 years	6	4.8
31-40 years	28	22.6
41-50 years	36	29.0
51-60 years	44	35.5
61-70 years	9	7.3
older than 70 years	1	0.8
Missing	0	0.0
<i>Professional qualification</i>		
Without professional qualification	1	0.8
Apprenticeship, vocational training in the dual system	34	27.4
Master craftsman/technician or equivalent technical college degree	28	22.6
Diploma, bachelor's degree, master's degree, state examination, teacher's examination	56	45.2
Doctorate	3	2.4
Other professional qualification	2	1.6
Missing	0	0.0
<i>Work experiences in the current social firm</i>		
Less than a year	5	4.0
1-5 years	55	44.4
6-10 years	25	20.2
11-15 years	22	17.7
15-20 years	11	8.9
More than 20 years	4	3.2
Missing	2	1.6
<i>Work time</i>		
Less than 20 hours	8	6.5
21-30 hours	10	8.1
31-40 hours	100	80.6
Missing	6	4.8
<i>Sectors</i>		
Hotels, restaurants and gastronomy	52	41.9
Building services	23	18.5
Gardening and landscaping	19	15.3
Manufacturing	29	23.4
Trade	25	20.2
Education and training	1	0.8
Other services	17	13.7
Other sectors	35	28.2
<i>Number of locations</i>		
1	53	42.7
2	18	14.5
3	18	14.5
4	10	8.1
More than 5	24	19.4

Missing	1	0.8
<i>Size of the company</i>		
1-9 employees	6	4.8
10-49 employees	61	49.2
50-249 employees	50	40.3
More than 250 employees	6	4.8
Missing	1	0.8
<i>Subordinate employees</i>		
1-10 employees	20	16.1
11-20 employees	37	29.8
21-30 employees	18	14.5
More than 30 employees	32	25.7
Missing	17	13.7

Notes. *Multiple choice answer.

Table 2 indicates descriptive statistics of the concerned variables including an acceptable reliability of all scales (Cronbach's Alpha, $\alpha > .7$).

Table 2 Descriptive statistics of concerned variables

Variables	M	SD	Min	Max	α
<i>Job demands</i>					
Quantitative demands	57.58	14.77	15	95	.74
Emotional demands	74.39	17.88	0	100	.78
<i>Job resources</i>					
Influence at work	71.81	17.25	25	100	.70
Meaning of work	85.47	14.79	50	100	.79
Perceived organisational support	5.24	1.24	1.75	7	.93
<i>Personal resources</i>					
Resilience	75.08	8.03	45	91	.84
<i>Outcomes</i>					
Work engagement	71.10	15.16	25	100	.78
Burnout symptoms	48.04	20.83	0	100	.84

Notes. α = Cronbach's Alpha.

Spearman correlation coefficients were highlighted in table 3. The correlation between quantitative job demands and burnout symptoms was positive and significant. No significant correlation coefficients were observed for quantitative demands and work engagement or for emotional demands and both outcomes. The three job resources each correlated significantly positively with work engagement and significantly negatively with burnout symptoms. Resilience was significantly positively related to work engagement and significantly negatively to burnout symptoms. The correlation between work engagement and burnout symptoms was significant and negative.

Table 3 Spearman correlation.

Variables	1	2	3	4	5	6	7	8
1. Quantitative Demands	-							
2. Emotional Demands	.130	-						
3. Meaning of work	-.016	.245**	-					
4. Perceived organisational support	-.143	.018	.367**	-				
5. Influence at work	-.229*	.066	.272**	.495**	-			
6. Resilience	-.159	.142	.372**	.248**	.404**	-		
7. Work engagement	.014	.139	.476**	.424**	.342**	.312**	-	
8. Burnout symptoms	.323**	.050	-.192*	-.345**	-.235**	-.212*	-.287**	-

Notes. Spearman correlation coefficient: * $p < .05$; ** $p < .01$.

As depicted in table 4, perceived organisational support was the strongest predictor for burnout symptoms with ca. 10% of explained variance. Within model 2, quantitative job demands were introduced following an increase of .059 in R^2 ($p < .01$). In models 3 to 6, no significant changes of R^2 were observed. The complete model 6 with all predictors of burnout symptoms was significant ($F(9, 104) = 3.43, p < .001$) and explained 16.2% of the variance (indicating a medium explained variance⁶⁵). Considering the proposed hypothesis, hypothesis 1a was partly confirmed, since quantitative demands significantly predicted burnout symptoms ($\beta = .236, p < .05$). In addition, supervisors reported several setting-specific demands. 123 supervisors highlighted tasks which had to be completed simultaneously (e.g., to deal with employee concerns during times of high work intensity, 76.9%, $n=83$) and frequent work interruptions (e.g., due to employee concerns, 61.3%, $n=76$) as demanding to a high/very high degree. Similarly, about half of the supervisors (46.8%, $n=58$) outlined that compensating for short-term employee absences also represented a demand to a high/very high degree. Other reasons which were rated as demanding to a high/very high degree included an administrative burden (39.6%, $n=49$), or a high number of employees to look after (20.1%, $n=25$).

In the further course of the analysis, hypothesis 2 was also partly confirmed for perceived organisational support ($\beta = -.217, p < .05$), but not for influence or meaning at work. However, when controlling for heteroscedasticity, lacking significance was observed for perceived organisational support. Hypothesis 3 on resilience as a personal resource can be rejected as well. Likewise, a moderation of resilience could not be found because of lacking significance in both interactions of resilience and emotional and quantitative demands, respectively. This leads to the conclusion that resilience did not moderate the relationship between quantitative and emotional demands and burnout symptoms (model fit: $F(10, 103) = 3.17, p < .001$ for quantitative demands and $F(10, 103) = 3.06, p < .01$ for emotional demands without significant changes in R^2). Figure 3 provides an overview of the conceptual model and the standardised coefficients.

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Table 4 Hierarchical regression analysis for burnout symptoms

Burnout symptoms	1			2			3			4			5			6			
	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	
Regression with SE																			
Regression with robust SE																			
Perceived organisational support	-5.594 (-8.606; -2.582)	1.520	-.337***	-4.971 (-7.925; -2.016)	1.490	-.300**	-4.333 (-7.688; -.978)	1.692	-.261*	-4.371 (-7.727; -1.014)	1.693	-.263*	-3.663 (-7.088; -.239)	1.727	-.221*	-3.593 (-7.073; -.113)	1.755	-.217*	
	-5.594 (-9.106; -2.083)	1.772	-.337**	-4.971 (-8.554; -1.388)	1.808	-.300**	-4.333 (-8.837; .171)	2.272	-.261	-4.371 (-8.875; .134)	2.272	-.263	-3.663 (-8.339; 1.006)	2.355	-.221	-3.593 (-8.453; 1.267)	2.451	-.217	
Quantitative Demands				.324 (.095; .552)	.115	.246**	.307 (.074; .540)	.117	.233*	.298 (.064; .531)	.118	.226*	.315 (.083; .547)	.117	.239**	.310 (.075; .546)	.119	.236*	
				.324 (.089; .559)	.118	.246**	.307 (.058; .555)	.125	.233*	.298 (.043; .522)	.129	.226*	.315 (.056; .574)	.131	.239*	.310 (.047; .574)	.133	.236*	
Influence at work							-.096 (-.335; .142)	.120	-.081	-.063 (-.311; .186)	.125	-.053	-.058 (-.304; .188)	.124	-.049	-.063 (-.313; .187)	.126	-.053	
							-.096 (-.364; .171)	.135	-.081	-.063 (-.339; .213)	.139	-.053	-.058 (-.334; .218)	.139	-.049	-.063 (-.350; .224)	.145	-.053	
Resilience										-.234 (-.709; .241)	.240	-.091	-.098 (-.594; .398)	.250	-.038	-.109 (-.614; .396)	.255	-.042	

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										-0.234 (-0.781; . 0.312)	.276	-0.091	-0.098 (-0.673; . 0.477)	.290	-0.038	-0.109 (-0.701; . 0.483)	.298	-0.042
Meaning of work													-0.221 (-0.476; . 0.033)	.129	-0.166	-0.227 (-0.487; . 0.032)	.131	-0.170
													-0.221 (-0.532; . 0.089)	.157	-0.166	-0.227 (-0.556; . 0.102)	.166	-0.170
Emotional demands																.027 (-0.176; . 0.231)	.102	.025
																.027 (-0.259; . 0.314)	.145	.025
n	114		114			114		114			114		114			114		
R ²	.136		.194			.199		.206			.228		.229					
Adj. R ²	.104		.157			.154		.154			.169		.162					

Notes. B=Unstandardized coefficient, β=standardized coefficient, 95% CI=95% confidence interval (lower bound, upper bound), SE=standard error, * p<.05; ** p<.01. *** p<.001. Controlled for sex, age groups and professional experience. To identify multicollinearity the VIF was analysed (Model 1: 1.058 for perceived organisational support; Model 2: 1.082 for perceived organisational support and 1.028 for quantitative job demands, Model 3: 1.391 for perceived organisational support, 1.063 for quantitative job demands and 1.379 for influence at work, Model 4: 1.392 for perceived organisational support, 1.070 for quantitative job demands, 1.492 for influence at work and 1.148 for resilience; Model 5: 1.475 for perceived organisational support, 1.078 for quantitative job demands, 1.492 for influence at work, 1.276 for resilience, 1.266 for meaning of work; Model 6: 1.509 for perceived organisational support, 1.100 for quantitative job demands, 1.528 for influence at work, 1.312 for resilience, 1.301 for meaning of work and 1.153 for emotional demands). To test for autocorrelation in the residuals the Durbin Watson Test was used (2.097) and cook's distance to examine outliers (between .000 and .152).

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3 Additionally, hierarchical regression analysis of job demands as well as job and personal
4 resources on work engagement provided significant insights (table 5). Within the first model,
5 meaning of work was included as the strongest predictor explaining about 20% of its variance.
6 In the next step, perceived organisational support was added, leading to an increase of R^2
7 of .078 ($p < .001$). In model 3 to 6, neither significant changes in R^2 nor significant predictors
8 of work engagement were observed. The complete model 6 with all predictors of work
9 engagement was significant ($F(9, 105) = 6.35, p < .001$) and explained about 30% of the
10 variance indicating a large explained variance⁶⁵. As a result, hypothesis 1b on the influence
11 of job demands on work engagement could be rejected. Hypothesis 2b could partly be
12 confirmed, since meaning of work ($\beta = .326, p < .001$) and perceived organisational support (β
13 = .245, $p < .05$) predicted work engagement of supervisors in social firms (Figure 3). As
14 observed for burnout symptoms, when controlling for heteroscedasticity, lacking significance
15 was identified for perceived organisational support. Hypothesis 3 on the personal resource
16 resilience and its effects on work engagement could be rejected.
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Table 5 Hierarchical regression analysis for work engagement

Work engagement	1			2			3			4			5			6			
	B with SE (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	B (95% CI)	SE	β	
Regression with SE																			
Regression with robust SE																			
Meaning of work	.449 (.288; .610)	.081	.463***	.362 (.202; .523)	.081	.374***	.348 (.188; .509)	.081	.359***	.317 (.149; .486)	.085	.327***	.319 (.147; .491)	.087	.329** *	.316 (.142; .488)	.087	.326** *	
	.449 (.264; .634)	.093	.463***	.362 (.163; .562)	.101	.374***	.348 (.150; .547)	.100	.359***	.317 (.128; .507)	.096	.327**	.319 (.123; .515)	.099	.329**	.316 (.118; .514)	.100	.326**	
Perceived organisational support				3.650 (1.616; 5.685)	1.026	.301***	2.842 (.577; 5.107)	1.143	.235*	2.963 (.692; 5.234)	1.146	.245*	2.940 (.629; 5.250)	1.165	.243*	2.972 (.653; 5.291)	1.170	.245*	
				3.650 (.341; 6.959)	1.670	.301*	2.842 (-.456; 6.140)	1.664	.235	2.963 (-.332; 6.259)	1.662	.245	2.940 (-.387; 6.267)	1.678	.243	2.972 (-.344; 6.288)	1.672	.245	
Influence at work							.123 (-.033; .278)	.078	.142	.096 (-.065; .258)	.081	.112	.098 (-.066; .261)	.082	.113	.107 (-.059; .274)	.084	.124	
							.123 (-.045; .290)	.085	.142	.096 (-.086; .278)	.092	.112	.098 (-.094; .289)	.097	.113	.107 (-.097; .311)	.103	.124	
Resilience										.192 (-.135; .520)	.165	.103	.195 (-.137; .528)	.168	.104	.209 (-.127; .546)	.170	.112	
							.192 (-.194;	.195	.103	.195 (-.191;	.195	.103	.195 (-.191;	.195	.104	.209 (-.174;	.191	.112	

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										.579)			.582)			.593)			
Emotional demands														-.009 (-.142; .125)	.067	-.011	-.015 (-.150; .120)	.068	-.019
														-.009 (-.163; .146)	.078	-.011	-.015 (-.180; .150)	.083	-.019
Quantitative Demands																	.052 (-.105; .209)	.079	.054
																	.052 (-.113; .217)	.083	.054
n	115			115			115			115			115			115			
R ²	.248			.326			.341			.350			.350			.352			
Adj. R ²	.221			.295			.305			.307			.301			.297			

Notes. B=Unstandardized coefficient, β=standardized coefficient, 95% CI=95% confidence interval (lower bound, upper bound), SE=standard error, * p<.05; ** p<.01. *** p<.001. Controlled for sex, age groups and professional experience. To identify multicollinearity the VIF was analysed (Model 1: 1.022 for meaning of work; Model 2: 1.124 for meaning of work and 1.161 for perceived organisational support; Model 3: 1.138 for meaning of work, 1.459 for perceived organisational support and 1.356 for influence at work; Model 4: 1.263 for meaning of work, 1.471 for perceived organisational support, 1.470 for influence at work and 1.277 for resilience; Model 5: 1.361 for meaning of work, 1.508 for perceived organisational support, 1.495 for influence at work, 1.306 for resilience and 1.128 for emotional demands; Model 6: 1.306 for meaning of work, 1.511 for perceived organisational support, 1.540 for influence at work, 1.327 for resilience, 1.152 for emotional demands and 1.103 for quantitative demands). To test for autocorrelation in the residuals the Durbin Watson Test was used (1.978) and cook's distance to examine outliers (between .000 and .321).

Discussion

Within the current state of research, the presented study was one of the first analysing working conditions of supervisors in German social firms working with employees with severe disabilities on the general labour market. Significant relations between job demands and job resources and burnout symptoms or work engagement were presented by using hierarchical regression analysis. Referring to the proposed hypotheses, hypothesis 1a was partly confirmed as quantitative demands significantly predicted burnout symptoms. Likewise, hypothesis 2a on perceived organisational support and its association with burnout symptoms was partly confirmed. The stated hypothesis on work engagement was partly verified as well. Hypothesis 1b referring to job demands and its relation to work engagement was rejected. In contrast, hypothesis 2b was partly confirmed on meaning of work and perceived organisational support. Hypothesis 3 and 4 on the role of resilience as a personal resource were rejected.

Working conditions in relation to burnout symptoms and work engagement

When referring to job demands of supervisors in social firms, previous studies postulate a conflict between social and economic goals in social firms for supervisors when operating a daily business on the general labour market^{8 12 17 18 24 37}. Therefore, working conditions were operationalized in the present study by means of quantitative and emotional demands. It was shown that only quantitative job demands were related to burnout symptoms of supervisors in social firms. These findings differ only to a limited extent, e.g., from supervisors in general⁴⁰, or from professionals in sheltered workshops⁷³. However, descriptive complements underlined task-specific factors and peculiarities for this setting. For instance, challenges like high workloads due to staff shortages⁷⁴ or work absences of employees due to mental health conditions which must be intercepted by the supervisor at short notice³⁷ were replicated as setting-specific demands of supervisors. Approaches to buffer quantitative demands are presented in recent qualitative results, calling for the support of non-disabled colleagues in the social firms' department³⁷.

Regarding emotional demands, assumed relations to burnout symptoms or work engagement could not be replicated leading to the conclusion that emotional demands are either perceived as less challenging or that sufficient support is already provided, e.g., by social pedagogies or specialists in work and career promotion. Though, perceived emotional demands of supervisors appeared much higher on a descriptive level in comparison to other occupations ($M=74.39$ for supervisors in social firms vs. $M=52$ for other occupations⁷⁵), wherefore more differentiated insights are needed. For instance, recent qualitative results inform about present fears and concerns of employees with disabilities in social firms, e.g. due to private problems³⁷. Therefore, cross-sectoral partnerships are suggested by other authors when merging both company objectives – not only due to challenges when finding skilled staff but also for improving social and pedagogical support of supervisors¹².

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5 With regard to job resources, perceived organisational support was presented as a crucial
6 resource impacting both burnout symptoms and work engagement, supporting the theory of
7 organisational support⁵¹. Though, both associations remained non-significant when controlling
8 for heteroscedasticity. Similar tendencies are found by Zimber et al.⁴⁰ for supervisors in
9 general stating social support as a central resource buffering mental strain reactions and by
10 Schwangler et al.⁷⁶ on low levels of appreciation at work (OR: 2.72; $p < .01$; 95%- CI: 1.32-5.58)
11 as increasing the risk of burnout. Likewise, results using the same construct to assess
12 perceived organisational support concur to influence emotional exhaustion and
13 depersonalization in disability support staff⁷⁷.

14
15 For the second job resource meaning of work, associations with work engagement were
16 evaluated. Beforehand, additional impacts of meaning of work on burnout were assumed^{48 49}
17 which could not be replicated in the present study. Prior qualitative results on supervisors of
18 social firms present a high perceived meaning of work when employees made progress and
19 gained more stability or improved language and motor skills. An attributed meaning of work is
20 also stated in comparison to other settings of the general labour market³⁷ which was also
21 underlined by descriptive statistics of the current study ($M=85.47$ for supervisors in social firms
22 vs. $M=75$ of other occupations⁷⁵).

23
24 Contrary to previous research, influence at work was neither evaluated as associated with
25 burnout symptoms nor work engagement. However, prior qualitative results highlight the
26 supervisors ability to influence their workload as well as decision-making processes as
27 important resources³⁷. In general, supervisors are described as having significantly more
28 latitude in decision-making in comparison to employees without a management function⁵².
29 Those differences were also apparent when comparing means of supervisors regarding their
30 influence at work ($M=71.81$) to other occupations ($M=42$)⁷⁵.

41 42 43 **Personal resources in relation to burnout symptoms and work engagement**

44
45 Adverse to postulated hypotheses and results of previous studies⁵⁵⁻⁵⁹, present findings
46 indicated that resilience was neither associated with burnout symptoms nor with work
47 engagement. However, correlation analysis was in line with our hypothesis highlighting
48 significant associations to work engagement and burnout symptoms. Nevertheless, when
49 introduced into the regression model, results were evaluated as non-significant leading to the
50 conclusion that working conditions appear as stronger predictors of burnout symptoms and
51 work engagement in comparison to resilience. Likewise, no moderating effects of resilience
52 were examined, which could be interpreted as quantitative demands were linked to burnout
53 irrespective of supervisors' levels of resilience and underlining the health impairment process
54 proposed by the theoretical framework of the study⁶⁰⁻⁶². According to the RS-13, supervisors
55 in general were characterised as having high levels of resilience indicating that they were able
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3 to adapt to challenging or adverse situations. Though, recent results emphasize that even with
4 high levels of resilience, individuals are still subject to burnout symptoms as resilience may
5 offer protection to some extent, but not full prevention ⁷⁸.

8 Implications for policy and practice

9
10 Overall, the results obtained provide important information for practice, which cannot only be
11 used by companies in the context of psychosocial risk assessment but can also provide starting
12 points for the development of interventions for workplace health promotion adapted for
13 supervisors in social firms (e.g., Efimov et al. ⁷⁹). It is recommended to combine both structural
14 and behavioural interventions to address supervisors' working conditions and own behaviour
15 ⁸⁰. On the one hand, structural approaches may reduce supervisors' quantitative demands,
16 which were according to present findings directly associated with burnout symptoms. In this
17 context, a reduction of time pressure, diminished workloads, higher staff ratios or more support
18 by non-disabled colleagues should be taken into consideration. Likewise, perceived
19 organisational support of supervisors should be addressed including interest in supervisors
20 and their opinions, goals, well-being, and job satisfaction, appreciation, and support in
21 challenging situations ⁷⁰. To increase and emphasize supervisors' meaning of work (which was
22 evaluated as associated with work engagement) and to reflect on their achievements like
23 progress among employees, elevated skills, independence, or stability team meetings and
24 workshops could be used. On the other hand, regardless of our results but in line with other
25 studies, behavioural approaches should be added, e.g., resilience trainings that strengthen
26 supervisors' personal resources and in turn increase work engagement ⁸¹. In general, results
27 are also relevant not only for strengthening supervisors' health and productivity but also to
28 enable them to provide appropriate support for their employees ⁸².

29
30 In general, when implementing health promotion interventions and a culture of health,
31 especially managing directors of social firms should recognize themselves as important key
32 players. Since social firms are mainly considered as small and medium-sized companies ⁸³
33 which often operate in more than five locations (19.4% in the present sample), cooperation
34 and regional partnerships for workplace health promotion for pooling resources, promoting
35 networking and exchange, and receiving technical and financial support, e.g., by social
36 insurance institutions, are recommended ⁸⁴.

51 Implications for future research

52
53 When classifying the study with the current state of research, it became apparent that various
54 subject areas or research designs in the context of social firms are not applied yet. Future
55 research should focus on longitudinal studies with larger sample sizes gaining insights into
56 causal relationships between job demands, resources and work and health-related outcomes
57 of supervisors in social firms. Due to identified parallels to supervisors from other sectors,
58 further comparative studies *between* supervisors in social firms and supervisors from other
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3 sectors might be a useful complementary approach as well as comparisons *within* predominant
4 sectors and tasks of supervisors in social firms. The development of new or adapted
5 instruments to assess peculiarities in the setting could also provide a starting point for further
6 research. Moreover, effects of emotional demands should be examined more differentiated or
7 other job demands, like physical ones, could also be included, as they have shown an
8 increased risk for burnout in studies from related settings ⁷⁶. When focussing on the prevention
9 of burnout, future studies could also gain insights into modifiable factors at work. For instance,
10 ways to distribute tasks or to organise work which are perceived as less straining can be
11 discussed as a complement to individual stress reduction approaches, especially when
12 persons concerned have narrow energy resources ⁸⁵. Other questions in the context of burnout
13 remain open ⁸⁵, e.g., due to different conceptualisations without providing threshold values
14 indicating a clinical disease. Moreover, results mostly rely on the self-reported appraisals of
15 participants without providing complementary approaches in applied methods ⁸⁵.

16 Likewise, ongoing COVID-19 pandemic-related influences on social firms can be included in
17 future studies ⁸⁶. Another field of research which can also be investigated is represented by
18 role model function of supervisors and the impact of health-oriented leadership on work- and
19 health-related outcomes of employees with disabilities ⁸². Lastly, further research may consider
20 the evaluation of workplace health promotion interventions in social firms or cooperation
21 approaches between small and medium-sized companies in this context.

22 Strengths and limitations

23 The study underlined the relevance of gaining insights into working conditions and work, and
24 health-related outcomes of supervisors of social firms in Germany. A strength of the study was
25 the systematic and randomised recruitment process of social firms. Well-validated instruments
26 were applied, and participants provided predominantly fully completed questionnaires.
27 However, setting or task-specific factors were only covered to a limited extent by the applied
28 validated constructs, which is why descriptive results on peculiarities for supervisors were
29 added (e.g., compensating for short-term employee absences). Additionally, the cross-
30 sectional design of the study did not allow causal conclusions. Data was collected by using
31 self-report measures of independent and dependent variables in the same measurement
32 context, which might have biased our results and introduced common method bias ⁸⁷.
33 Furthermore, a possible selection bias cannot be ruled out, either due to voluntary participation,
34 so that individuals with certain characteristics are more likely to participate in the study, or due
35 to non-response, wherefore participants with a certain characteristic drop out of the study or
36 do not participate at all. Likewise, the population in which the online survey was distributed
37 cannot be described ⁸⁸, since managing directors were instructed to forward the survey.
38 Therefore, representativeness for all social firms in Germany cannot be expected. Lastly, an
39 influence of the COVID-19 pandemic and the resulting changes in working conditions in social
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3 firms may have affected the results of the study. Explorative results underlined that at the
4 beginning of 2020, employees reported fears of an infection with SARS-CoV-2, e.g., due to
5 comorbidities and a lack of routines, which affected especially employees with mental illnesses.
6 Likewise, a sudden loss of work was perceived as stressful resulting in boredom, a lack of
7 exercise, and social contacts. Therefore, supervisors had to deal with less staffing, the
8 interception of work and economic impacts for the social firm ⁸⁶.

13 Conclusion

14 The results were one of the first gaining insights into working conditions and its associated
15 outcomes of supervisors in German social firms providing people with disabilities employment
16 on the general labour market. Offered results mainly resonated with the proposed associations
17 according to the JD-R model. Results on the working conditions of supervisors differed only to
18 a limited extent from those of other supervisors on the general labour market. However,
19 descriptive complements underlined task-specific factors for this setting providing starting
20 points for psychosocial risk assessment or the development of interventions for workplace
21 health promotion. Those interventions should mainly focus on reducing quantitative demands
22 and strengthen perceived organisational support of supervisors to promote work engagement
23 and reduce burnout symptoms. Likewise, a high meaning of work should be emphasized.
24 Lastly, it should be noted that the consideration of the supervisors working conditions enables
25 both, a promotion of their own health and productivity, and the provision of appropriate support
26 for their employees with disabilities.
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Declarations

Data availability statement

The datasets analysed during the current study are not publicly available due to German national data protection regulations.

Competing interests

The authors declare that they have no competing interests.

Patient consent for publication

Not applicable.

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Authors' contributions

All authors conceived of the study and participated in its design. ACK, IE, VH and SM designed the online survey. ACK recruited supervisors of social firms, conducted statistical analyses, and drafted the manuscript. IE, VH and SM contributed to data interpretation and to the revision of the manuscript. All authors read and approved the final version of the manuscript.

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We gratefully acknowledge all supervisors who participated in the study.

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Figure legends

Figure 1

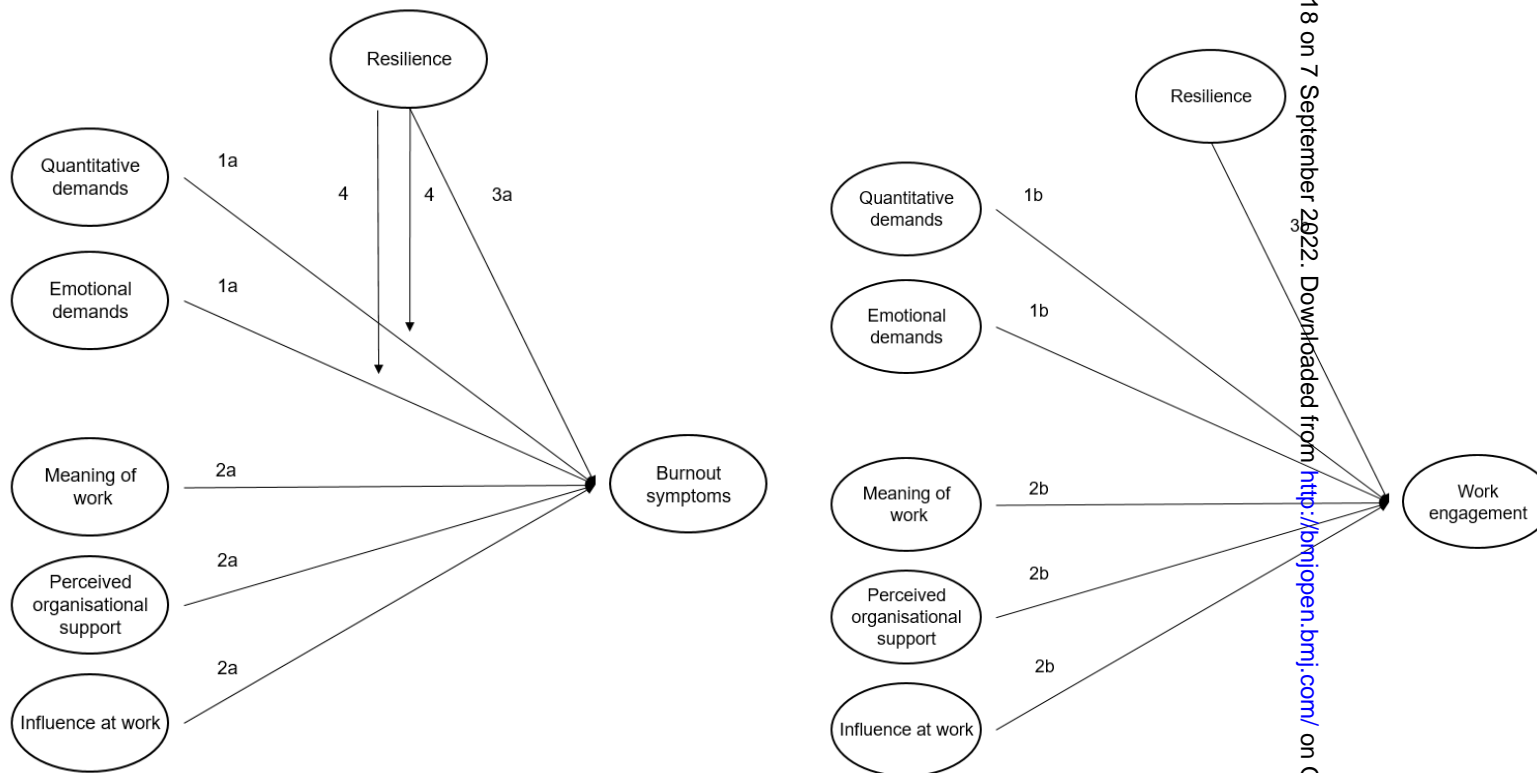
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21 Conceptual model of the study with displayed hypothesis.

Figure 2

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25 Recruitment process of the study.

Figure 3

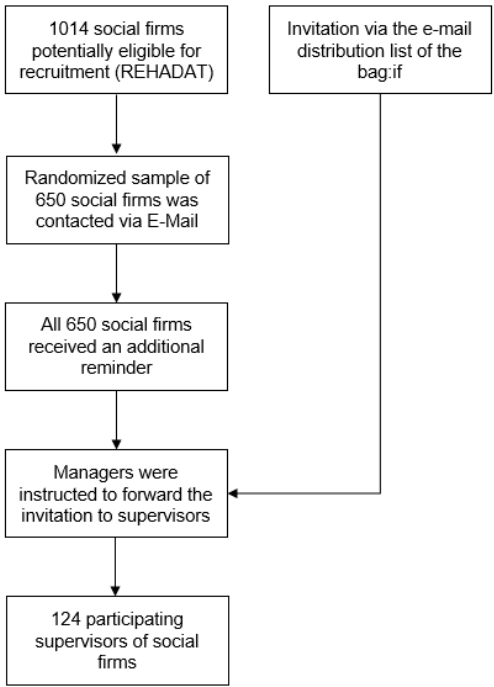
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30 Conceptual model of the study with standardized beta-coefficients * $p < .05$; ** $p < .01$. *** $p < .001$.
31 Controlled for sex, age groups and work experience in the current social firm.



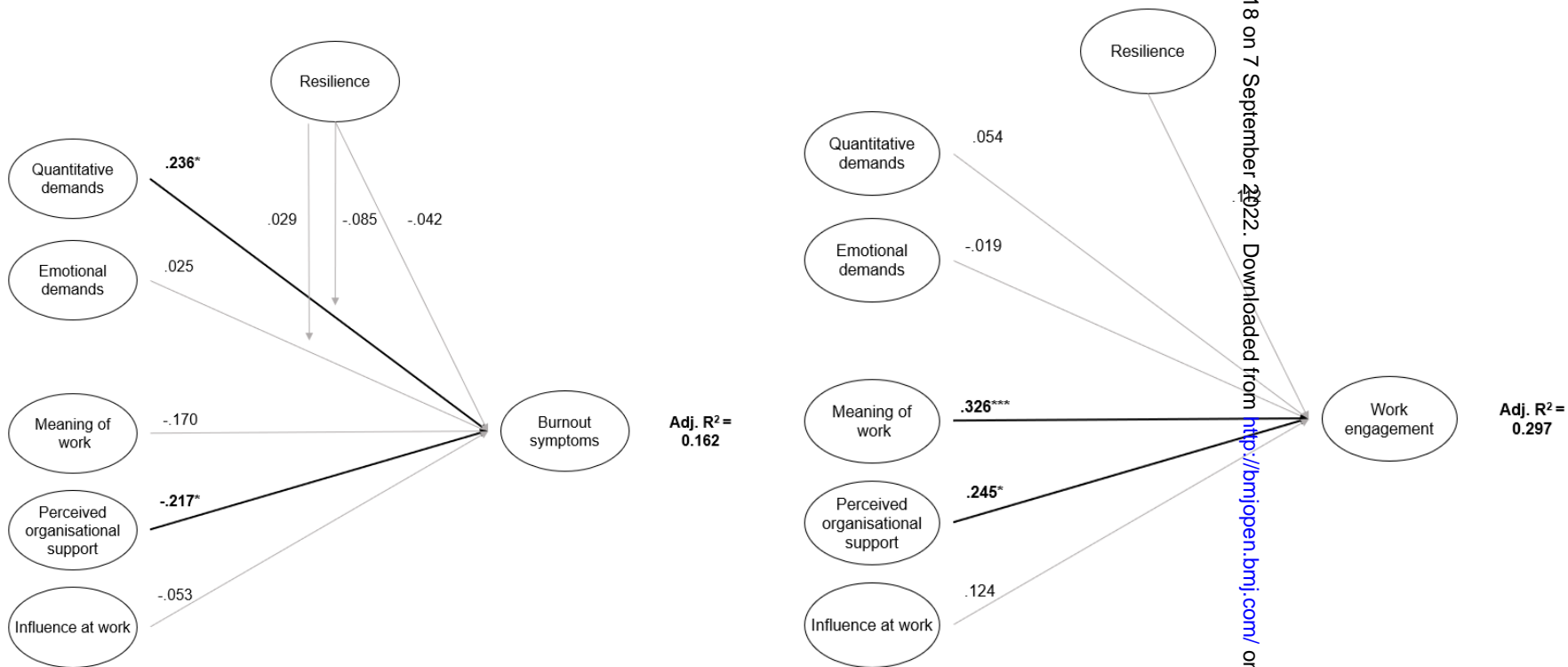
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STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of cross-sectional studies

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	<u>3-4-6</u>
Objectives	3	State specific objectives, including any prespecified hypotheses	<u>5-6-7</u>
Methods			
Study design	4	Present key elements of study design early in the paper	<u>7-6</u>
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	<u>7-8-6</u>
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	<u>7-8-6</u>
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	<u>8-9-6-8</u>
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	<u>8-9-6-8</u>
Bias	9	Describe any efforts to address potential sources of bias	<u>9-10-8</u>
Study size	10	Explain how the study size was arrived at	<u>8-6</u>
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	<u>9-10-8</u>
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	<u>9-10-8</u>
		(b) Describe any methods used to examine subgroups and interactions	<u>9-10</u> Not applicable
		(c) Explain how missing data were addressed	<u>9-10</u>
		(d) If applicable, describe analytical methods taking account of sampling strategy	Not applicable
		(e) Describe any sensitivity analyses	Not applicable
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	<u>86</u>
		(b) Give reasons for non-participation at each stage	Not applicable
		(c) Consider use of a flow diagram	<u>76</u>
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	<u>8-10</u> 10-12
		(b) Indicate number of participants with missing data for each variable of interest	<u>10-12</u> 9-10
Outcome data	15*	Report numbers of outcome events or summary measures	<u>12</u> 10
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	<u>13-18</u> 13-14
		(b) Report category boundaries when continuous variables were categorized	Not applicable
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	Not applicable
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Not applicable <u>13</u>
Discussion			
Key results	18	Summarise key results with reference to study objectives	<u>15</u> 19
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	<u>22-23</u> 18
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	<u>19-23</u> 18
Generalisability	21	Discuss the generalisability (external validity) of the study results	<u>22-23</u> 18
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	<u>24</u> 19

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.