Short-term effects of social stressors at work on rumination and physical symptoms in social workers

Andrea EGGLI[1]*, Diana ROMANO-PEREIRA[1] and Achim ELFERING[2]

[1]Departement Soziale Arbeit, Berner Fachhochschule BFH, Switzerland
[2]Institut für Psychologie, Universität Bern, Switzerland

Abstract: The present study focuses on social stressors at work and the development of physical symptoms in social workers on a daily basis. In a seven-day diary study it was anticipated that daily rumination functions as a mediator, linked to additional daily physical symptoms in individuals. Before and after work, 81 social workers completed daily questions on social stressors, rumination, and physical symptoms. Multilevel analyses of up to 391 daily measurements revealed that more intense social stressors predicted more rumination, as well as physical symptoms. Rumination anteceded higher physical symptoms. A test of the indirect effects showed a significant indirect path from social stressors at work via rumination to physical symptoms. Hence, it was found that social stressors and rumination contribute to the ongoing health crisis in the social work profession. These findings advance our understanding of the stress mechanisms in social work, as well as point to individual and organizational aspects that occupational health prevention programs should consider.

Key words: Social work, Social stressors, Rumination, Physical symptoms, Occupational health

Introduction

Social collaboration is the unifying method and principle of social work, meaning that the maximum social service potential cannot be accomplished individually but only if stakeholders (i.e. social workers, clients, agencies, colleagues) unite their resources[1]. Yet, social workers often face a high prevalence of difficult interpersonal interactions with clients, supervisors and co-workers[2]. Especially the interdisciplinary collaborations are challenging, as values, roles and professional statuses often differ between social workers and individuals from other disciplines (e.g., teachers)[3]. As a result, social stressors are likely to arise.

Social stressors are defined as social characteristics, situations, episodes, or behaviors that are associated to psychological and physical strain, and are of social nature[4] (e.g., social animosities, conflicts with co-workers and supervisors, unfair behaviours, and negative group climate)[5]. For example, the European working conditions survey[6] reported that within one month prior to the survey 12% of employees experienced verbal abuse, 6% humilation behaviour and 4% threats. In certain instances, socially tense situations can have enhancing effects (e.g., opportunity to show competence)[7]. However, the majority of empirical evidence suggests that social stressors are mainly linked to strainful con-

*To whom correspondence should be addressed.
E-mail address: andrea.eggli@bfh.ch

sequences[4, 5, 8, 9]. This strain can be explained along the "Stress-as-Offense-to-Self" theory (SOS)[10], postulating that individuals are motivated to establish and maintain a positive personal and social self-image. If this need for a positive self-view is not met (e.g., due to social stressors), then stress reactions as well as health problems may arise[10, 11]. Furthermore, when considering stress and work-related social interactions, Dormann and Zapf [4] have drawn on the theory of "Conservation of Resource" (COR)[12]. This theory highlights how individuals are driven to attain and protect personal and social resources; thus, if these resources are threatened, lost or unable to be regained due to specific work-related events (e.g., social stressors) then stress is experienced[12]. Indeed, various resources have been identified (i.e., self-esteem, self-efficacy, goal persuit) that come under threat in the face of social stressors[4, 5, 10] and thus a risk for stress experiences occurs. This risk is heightened further, according to the "Job Demand Resource" model (JD-R)[13], when threats to or lack of resources (e.g., self-esteem) stand in combination with heighted job demands (e.g., social stressors), and may even foster physical symptoms (e.g., exhaustion). The question arises how these social stressors are specifically linked to social workers' health.

Negative health outcomes of social stressors have been identified in several professions and include depression[5], poor sleep fragmentation, psychosomatic health complaints[8], inhibition of recovery processes[14], burnout[4], attention failure and rumination[15]. Yet, these studies applied longitudinal and cross-sectional designs[4, 5, 8, 15], thus did not investigate social stressors' relation to health consequences on a daily basis. Another topic not covered by prior social work research is the consideration of physical symptoms (e.g., headaches) as an alternative marker to the commonly applied well-being indicators (e.g., burnout)[16]. Considering physical problems is vital, as such health issues are closely linked to job stressors[8, 17] and often remain clinically undiagnosed, while producing immense organizational costs due to sick leaves and productivity loss[18].

It is already established that the social work sector has a higher prevalence for musculoskeletal disorders, work-related stress and mental illnesses than other occupational domains[19–21]. Thus, physical symptoms are to be expected, especially since the high turn-over intentions and sick leaves[22] in this occupation hint towards such symptoms. The SOS, COR and JD-R models theoretically underpin the link between social stressors and health complaints: It is the combination of a) facing the daily job demand of social stressors and b) experiencing an immediate threat or loss to the vital resource of personal and social self-esteem due to

these social stressors that directly evoke physical symptoms[12, 13]. Cross-sectional and longitudinal studies from other disciplines found social stressors positively linked to psychosomatic/physical symptoms[8, 23, 24]. However, short-term daily associations remain empirically undetermined, although laboratory studies have found social-evaluative threats, as experienced during social stressor incidences, to evoke immediate harmful physiological reactions (i.e., high cortisol levels)[25]. Thus, an anylsis of whether social stressors are related to physical complaints on a short-term basis is needed.

At this point, however, another arising question is whether social stressors at work from the previous day directly affect physical health the next day, or if there is a mediator involved. Scholars argue that stressors' effects on health is predominantly determined by mechanisms of inadequate recovery, such as being able to psychophysiologically unwind and replenish depleted resource[26]. One mechanism, known for impairing such disconnecting, is rumination[26], a mode of responding to distress that involves repetitively and passively fixating on a problem, and the associated feelings, without taking action[27]. Such after-work rumination is considered a maladaptive coping response, because emotional and physiological reactions associated with the stressor are prolonged and reactivated, impairing the employee's successful recovery process and eliciting negative health effects[17, 26]. This notion is supported by the qualitative research of Beer *et al*.[28] that social workers facing stressors out of their control (e.g., social stressors with supervisors or co-workers) are likely to adapt rumination as a negative coping response. The health consequences of such rumination is extensive, and even includes physical symptoms[17, 26]. Although cross-sectional and qualitative studies indicate that ruminative thoughts potentially impact social workers' health[17, 26], the question is whether daily rumination goes as far as to mediate the path between social stressors and physical symptoms.

Purpose of this study

To our knowledge, understanding is missing on how social stressors are related to adverse health consequences on a daily basis, as a large portion of studies applied cross-sectional and longitudinal methods[4, 5, 8, 15, 23, 24]. The present study is capable to redeem this limitation by means of its diary study design.

It is thus hypothesized that social stressors at work on the previous day will positively affect daily physical symptoms (H1) as well as daily rumination (H2). Furthermore, rumination is expected to be positively related to physical symp-

toms on a daily basis (H3). Lastly, it is anticipated that daily rumination will positively mediate the relationship between social stressors on the previous day and daily physical symptoms (H4).

Subjects and Methods

Sample

Participants were recruited by advertisements (convenience sampling) in journals and websites of Swiss Social Work Unions, as well as on university platforms. Due to convenience sampling, the participation rate could not be derived. All study participants provided informed consent, and the study design was approved by the ethics committee of the University of Bern, Switzerland (Nr. 2010-08-00003).

Data collection took place between May and July 2019 by means of online questionnaires. Once participants completed the general online questionnaire, they entered the online diary study and filled in daily questionnaires from Monday till Sunday. To be included in the study, participants had to be employed as social workers in Switzerland and had to be employed at a minimum of 40%, calculated based on Swiss full-time employment. A total of 81 participants agreed to take part in the study, of which 63 (77.8%) were female and 18 (22.2%) male. On average, participants were 39.7 years old, with an age range of 23–62 years (*SD*=10.03). Participants were employed in various social work fields, including educational and psychiatric social work, disability services, state social services and immigration assistance. The sample size on Level 2 was between 74 and 81, exceeding the recommended minimum sample size of 50[29]. The sample size of Level 1 ranged from 234 to 391. Owing to missing values (i.e., autocorrelations or participants did not work on a particular day), the size on level 1 varies for the different variables (e.g., social stressors, rumination, physical symptoms); for most analyses, *N* is 74. No dropouts of participants were reported.

Instrument

Questionnaire

Prior to collecting diary measures, participants filled in a general questionnaire that assessed the demographic and occupational background (Level 2 variables). The completion of the general questionnaire was mandatory before continuing with the diary study.

Diary Study

For the data collection of Level 1 variables, two distinct self-report questionnaires were used: A morning questionnaire to measure changes in rumination and an evening questionnaire to assess social stressors and physical symptoms. Both questionnaires had to be completed on all working days, the morning questionnaire before starting work, and the evening questionnaire after ending work (see Fig. 1 for the diary study design).

Social Stressors at work

To measure social stressors at work, a German scale, developed by Frese and Zapf [30], was used. This scale included 10 items that measure interpersonal tensions (e.g., conflicts, personal animosities, and unfair behavior) with co-workers and supervisors/managers after workdays. Items were introduced in the following way "to what extent do the following statements apply to you? Today…," and examples are "I had to pay for the mistakes of my colleagues" or "when a mistake occurred, my supervisor always pushed it on me never on himself." Scoring of all items resulted on a 5-point scale, ranging from 1 (not at all) to 5 (absolutely). The mean social stressor score was 1.05 (*SD*=0.26) and Cronbach's alpha was α=0.84. The scale has been used by prior studies and shown validity in regard to job characteristics and health variables[5, 9].

Rumination

Ratings on daily rumination were made on a two-item scale based on the one provided by Mohr *et al.*[31]. The scale was rated on a 5-point Likert scale, ranging from 1 (rarely/none) to 5 (frequently/constantly). With the following sentence, the items were introduced: "To what extent do the following statements apply to you? Yesterday evening…". An item example is "it was difficult for me to mentally switch off after work". The mean score of the scale was 2.03 (*SD*=1.26). Similar to past research[15], the present study found a satisfactory internal consistency for the rumination scale (α=0.92). Syrek and Antoni[32] also found the scale to have good item-intercorrelations (0.76–0.95; M=0.86, *SD*=0.07) and retest-reliability of 0.58.

Physical Symptoms

To measure physical symptoms, a 9-item scale developed by Mohr[33] was used. Participants were instructed the

Days	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
Questionnaire	MQ	AWQ	MQ	AWQ	MQ	AWQ	MQ	AWQ	MQ	AWQ	MQ	AWQ	MQ	AWQ
Items	R	SS & PS	R	SS & PS	R	SS & PS	R	SS & PS	R	SS & PS	R	SS & PS	R	SS & PS

Fig. 1. Diary study design overview

Figure Legend:

MQ = Morning Questionnaire

AWQ = After-Work Questionnaire

R = Rumination on the previous evening

SS = Social Stressors on that day

PS = Physical Symptoms

following way: "To what extent do the following statements apply to you? Yesterday after work I had…," and item examples are "restlessness/nervousness," "difficulties in concentrating," and "headaches." The answer category was a 5-point Likert scale, ranging from 1 (rarely/none) to 5 (frequently/constantly). The scale has been applied in a variety of occupational stress studies[8], which, similarly to our study ($\alpha=0.79$) found the internal consistency to be satisfactory. The scale's mean score was 1.37 ($SD=0.67$).

Control Variables

Since physical symptoms have been suggested to differ depending on age and gender[8], these Level 2 variables were controlled for.

Daily hassles at home have been found to be linked to poor psychological distress[34]. To make sure that the relationship between social stressors at work and physical symptoms are not influenced by daily hassles at home, we controlled for this variable. Daily hassles at home were measured daily (Level 1) every morning, by means of one-item, asking participants "Have you had any conflicts/disputes yesterday with the following people?" The five answer categories were "spouse," "children," "a friend," "family member," or "other person."

To ensure that social support at home, which is known for reducing strain/stress[35], did not diminish social stressors' relation to physical symptoms, we controlled for social support at home. This control variable was assessed daily (Level 1), every morning with one-item: "Did the following people help you yesterday with problems or concerns?". Five answer categories ("spouse," "children," "a friend," "family member," or "other person") were given.

Finally, participants' scores for each working day may vary drastically, depending on what he/she experienced on each day. Since we were interested in exactly these differences, we, in essence, compared the individual with him/herself

on the previous day; hence, controlled the Level 1 variables for the previous day score (i.e., social stressors, physical symptoms, rumination). To do so, the stability of the prior day scores were calculated for every day, except for the first day of the diary study, by means of autocorrelations.

Procedure and Analysis

To compensate participants for their time and encourage participation, a raffle to win vouchers was advertised. Willing participants received an email with research information and a link to the general online questionnaire. They were asked to complete the general questionnaire, and then continue with the diary data collection. During the seven-day diary study, participants completed a self-report questionnaire every morning and evening of their working days, from Monday until Sunday. Participants were specifically instructed to not answer questionnaires on their work-free days.

For the statistical analysis of the multilevel regression models, "The R Project for Statistical Computing[36]" was used, as the daily data (Level 1) were nested within participants (Level 2). Fixed effects models were calculated to estimate within effects that were not biased by between effects that are different from them[37]. The present study focused on the within-persons relationships between social stressors at work on the previous day, rumination, as well as physical symptoms. The Level 1 predictor variable (i.e., social stressors) was group-mean centered. This allowed for the variable's effect to be interpreted in relation to the individual's own mean across all days. The age variable on Level 2 was grand-mean centered. Gender as well as the mediator (i.e., rumination) and outcome variable (i.e., physical symptoms) remained uncentered. The sample size on Level 1 ranged from 234 to 391 and for Level 2 it ranged between 74 and 81. Depending on missing values, the Level 1 sample size varied for different variables (i.e., social stressors, rumination, physical symptoms, daily has-

sles at home, social support at home); it was thus advantageous that multilevel analysis allows for a changing number of observations (i.e., missing data). Note that unstandardized coefficients were reported.

For multilevel mediation testing the Monte Carlo method (MCMAM) was used, which assumes that the 'a' and 'b' parameters have a normal sampling distribution[38]. By using the parameter estimates and their associated asymptotic variances and covariances, one can simulate random draws from the joint distribution of 'a' and 'b' and compute the product of these values[38]. This process is then repeated numerously (i.e., 20,000 times) and the resulting distribution of the 'a'*'b' values is applied to estimate a confidence interval around the observed value of 'a'*'b'[38]. The Monte Carlo method is suitable for the present study, as it allows multilevel indirect effect analyses, parametric bootstrapping, and is known for producing more accurate results for small sample sizes[39].

Results

Means, standard deviations and correlations of the measures are presented in Table 1. Before testing our hypotheses, we calculated a Null Model to estimate the proportion of variance in physical symptoms that is accounted for the day (Level 1) and person (Level 2) levels[40] (see Model 1 in Table 2). The obtained intraclass correlation (ICC) estimates of 0.22 for Level 2 and 0.23 for Level 1 variance indicate that 49% of the variance is within-person variance, implying the use of multilevel modeling to be adequate[40].

To test if social stressors at work are negatively related to physical symptoms, we regressed this relation in four separate analyses. Each hypothesis was tested with a model: Model 1 was the null model, to which we then successively added predictors, namely social stressors at work (Model 2) and rumination (Model 3). We additionally analyzed whether social stressors at work are positively linked to rumination (Model 5). In line with our assumptions, social stressors at work on the previous day had a positive effect on physical symptoms ($\gamma=0.54$, $p<0.001$; see Model 2 in Table 2) and rumination ($\gamma=0.71$, $p<0.01$; see Model 5 in Table 2). As anticipated, it was further found that rumination positively predicted physical symptoms ($\gamma=0.16$, $p<0.001$; see Model 3 in Table 2). The multilevel mediation regression analysis, including all involved variables, revealed that all paths remained significant ($\gamma=0.13$, $p<0.001$; see Model 4 in Table 2; Fig. 2). Thus, all of our hypotheses were supported (Table 2).

By means of a Monte Carlo Simulation[38], the multilevel mediation analysis was additionally conducted with 20'000 bootstrap samples. The procedure obtained 95% confidence interval lower and upper limits of 0.03 and 0.22, respec-

Table 1. Descriptive statistics and correlations for the study variables

Variable	M	SD	N	1	2	3	4	5	6	7
1. Sex [a]	0.20	0.40	493		0.37**	-0.09	0.09	-0.11*	0.07	0.01
2. Age	39.66	10.03	493	0.37***		0.01	0.02	-0.19**	0.20**	0.05
3. Physical Symptoms	1.37	0.67	391	-0.07	0.02		0.19**	0.34**	0.11*	0.38**
4. Social Stressors at work [b]	1.05	0.26	258	0.05	0.02	0.21***		0.20**	0.09	0.14**
5. Rumination	2.03	1.26	393	-0.08	-0.13**	0.30***	0.14*		0.13**	0.15**
6. Daily hassles at home	0.17	0.37	393	0.05	0.11*	0.11*	0.11	0.04		0.34**
7. Social support at home	0.55	0.50	393	0.01	0.03	0.27***	0.06	0.14**	0.17***	

Note. [a] 0=female, 1=male. [b] of the previous day.

*p<0.05, **p<0.01, ***p<0.001, two-tailed.

Lower Triage = Within-person Correlations

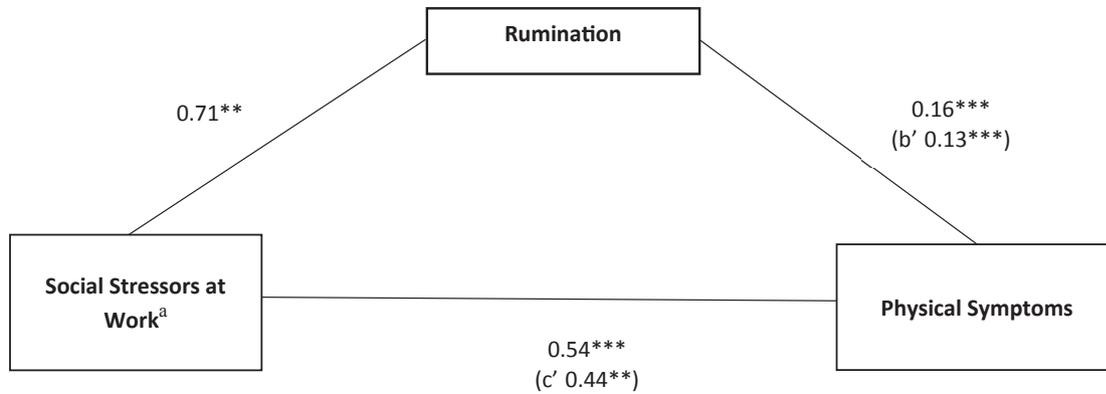Upper Triage = Between-person Correlations

Fig. 2. Mediation model: rumination mediating the effects of social stressors at work on physical symptoms

Note. Standardized Coefficients are reported.

Included control variables: Daily hassles at home, Social support at home, physical symptoms[a], age, sex.

[a] on the previous day.

*p<0.05, **p<0.01, ***p<0.001, two-tailed.

Table 2. Fixed effects estimates and standard errors for the predictor models

	Model 1		Model 2		Model 3		Model 4		Model 5	
					Fixed Effects					
			Predictors of Physical Symptoms						Predictor of Rumination	
Variables	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Intercept	1.38***	0.06	1.11***	0.24	0.67**	0.25	0.82***	0.24	2.58***	0.53
Level 1										
Daily hassles at home			-0.01	0.10	0.05	0.09	-0.02	0.10	0.01	0.20
Social support at home			0.18*	0.07	0.17*	0.07	0.15*	0.07	0.24	0.15
Physical Symptoms [b]			0.21***	0.06	0.10	0.05	0.17**	0.06		
Social Stressors at work [b]			0.54***	0.14			0.44**	0.14	0.71**	0.27
Rumination					0.16***	0.03	0.13***	0.03		
Level 2										
Sex [a]			-0.10	0.14	-0.16	0.14	-0.07	0.13	-0.20	0.32
Age			-0.00	0.01	0.00	0.01	-0.00	0.01	-0.01	0.01

Note. N Level 1= 234–391, N Level 2= 74–81.

*p<0.05, **p<0.01, ***p<0.001, two-tailed.

[a] 0=female, 1=male.

[b] of the previous day.

tively. Since the distribution of estimated 95% CI (LL=0.03, UL=0.22) does not include zero, the indirect path can be considered significant[38].

Discussion

The present diary study aimed to investigate the within-person daily relationships between social stressors and physical health in the social work population. Additionally, the goal was to understand if rumination mediated the link between social stressors and physical symptoms on a daily basis. Supportive of all hypotheses, multilevel analyses revealed that social stressors had a short-term positive effect on physical symptoms; and that this relation was indeed mediated by rumination.

To our knowledge, this is one of the first studies to disclose intra-individual short-term relations between social stressors and physical symptoms of social workers. While this finding is already a valuable addition to the existing knowledge base on the impact of social stressors on health[4, 5, 15, 24], the present study took its investigation one step further. By means of a multilevel mediation analyses, the authors were able to establish that daily rumination has a short-term disruptive function on social workers' recovery process from social stressors, and thus mediates the path to poor health (i.e., physical symptoms) on a day-to-day basis. These findings are vital, as currently little understanding exists on short-term relations between social stressors, physical symptoms, and rumination in the social work context. Strategically, the present study aimed to redeem these gaps and ultimately contribute to the understanding of the social work health crisis.

In line with our expectations, social stressors with colleagues and supervisors were found to have a positive short-term relationship with social worker's physical health. This finding reflects the theoretical propositions of the SOS model[10], according to which if individuals are unable to fulfill their need for a positive personal and social self-image, then signs of strain and poor health emerge. Also the premise of the COR model[12] gives an explanation for the current results: A work-related social stressor incidence triggers the employee to perceive or experience an instant loss in resources (e.g., self-esteem) and this threat to resources directly brings about physical symptoms[4]. This immediate threat of resources in combination with continuing heightened job demands (e.g., ongoing social stressors) is likely to ignite even more strain and physical symtoms, according to the JD-R model[13]. Although many previous studies have revealed adverse health outcomes of social

stressors[4, 5, 14, 15], only a few have investigated the association to physical symptoms[8, 23, 24], but not short-term. The present results thus revealed that physical symptoms may represent short-term detection markers for the presence of social stressors in the work environment.

As anticipated, results also found within-person daily social stressors at work to antecede social workers' daily rumination habits. That is, if social stressors were experienced during day, then it led to rumination the same evening. A recent qualitative study by Beer *et al.*[28] revealed that social workers apply rumination as a maladaptive coping mechanism in response to uncontrollable job stressors. This stands in line with studies finding rumination to arise after having faced a stressor at work[26, 41]. Based on Kinman *et al.*[42] argumentation, findings such as these are of high importance, as they indicate potential disruptions to social worker's recovery processes shortly after post stress incidences.

Hinting toward a disrupted recovery process was the finding that ruminative thoughts were positively linked to social workers' physical symptoms on a daily basis. Theoretically speaking, social worker's rumination reactivates and prolongs the stress responses, due to which recovery is made difficult and thus physical symptoms arise[26, 41]. Although prior studies revealed various negative health effects from rumination[26], physical symptoms were seldom mentioned[17], especially not in the social work context; thus, the current research filled a research gap. This result is also crucial in that it shows that a common coping response of social workers, namely daily rumination[28], may be a driver of the health crisis in this profession.

In reference to stress, an important mechanism has been identified in the present investigation. Consistent with predictions, rumination was found as an intra-individual short-term mediator between social stressors at work and physical symptoms from day-to-day. The theoretical process behind this mediation model is expected to be as follows: When faced with the heightened job demand of social stressors at work, it is likely that in combination with the threat and actual loss of valuable resources, a sensitive nerve is struck within social workers (e.g., threat to one's personal and social self-image)[10, 12, 13], which ignites ruminative thinking about the stressor post work[4, 41]. This rumination re-activates the emotional and physiological stress response, originally experienced during the socially stressful incident, which ultimately keeps the stressor alive and prevents recovery from setting in[26, 41]. As a result of the inability to recover from the stressor, the social worker experiences adverse health effects shortly after[26, 41], in this case physical

symptoms. Demsky et al.[43] identified rumination as a key mechanism between work stressors and strain outcomes. With the current findings support was found for Kinman et al.[42] assumption that rumination may be a determinant for recovery processes of social workers, particularly on a daily basis.

Considering that successful recovery is vital for stress relief[41] and given the high presence of stress in social work practice[28], it is surprising that short-term intra-individual recovery mechanisms of social workers have not gained more empirical focus. The present study strengthened the foundation, on which future researchers can be built to identify more potential disrupters of recovery.

Study Advantages and Limitations

Our study has a main advantage, namely its applied diary design. Many psychological constructs (e.g., physiological responses) are strongly dependent on situational conditions (e.g., social stressor incidences) and thus bound to daily fluctuations[44]. By applying a diary design we were able to analyze these interindividual daily variations[44].

However, there are limitations to the present study that should be noted. For one, studies that only apply self-report measures are greatly criticized for two reasons: 1) self-reports are prone to various types of response biases, and 2) if all variable in an organizational behavior study are based on one measurement method, significant results may likely be tainted by shared method variance[45]. A further limitation is that the participation inclusion criteria did not specify a social work field (e.g., clinical social work or school social work). The field pre-determines, to some extent, the social interactions that social workers face; for instance, outreach social workers predominantly approach young people, with who specific social stressors emerge. In our study it can thus be expected that the social workers from various disciplines were confronted with different social stressors, as the characteristics of their clients differed (e.g., age or ethnicity). Lastly, a longer timeframe of rumination would have been beneficial (i.e., "morning," "after work," "before bedtime"), as rumination levels vary drastically from the time "after workhours" to "before bed-time"[41].

Practical Implications and Conclusion

Our results suggest that daily social stressors at work are antecedents of daily rumination and increase short-term physical symptoms in social workers. Furthermore, the driving force behind the relationship between daily social stressors and daily physical health was uncovered, namely rumination as a daily within-person mediator. Since physi-

cal symptoms often remain undiagnosed[18], social work practice needs to be sensitized for these complaints and be able to identify their sources. As for prevention measures, social workers should be given alternative coping mechanisms, assisting recovery processes immediately after stressful incidences, rather than fostering ill-health through daily rumination. Studies as the present one, will ultimately assist the resolution of the current health crisis in social work.

References

1) Graham JR, Barter K (1999) Collaboration: A Social Work Practice Method. Fam Soc **80**, 6–13.

2) Shier ML, Graham JR, Nicholas D (2018) Interpersonal interactions, workplace violence, and occupational health outcomes among social workers. J Soc Work **18**, 525–47.

3) Bronstein LR (2003) A model for interdisciplinary collaboration. Soc Work **48**, 297–306.

4) Dormann C, Zapf D (2004) Customer-related social stressors and burnout. J Occup Health Psychol **9**, 61–82.

5) Dormann C, Zapf D (2002) Social stressors at work, irritation, and depressive symptoms: Accounting for unmeasured third variables in a multi-wave study. J Occup Organ Psychol **75**, 33–58.

6) Eurofound. Sixth European Working Conditions Survey – Overview report (2017 update). Luxembourg: Publications Office of the European Union; 2017.

7) Kern M, Heissler C, Zapf D (2020) Social job stressors can foster employee well-being: Introducing the concept of social challenge stressors. J Bus Psychol, 1–22.

8) Pereira D, Elfering A (2014) Social stressors at work, sleep quality and psychosomatic health complaints—a longitudinal ambulatory field study. Appl Psychophysiol Biofeedback **30**, 43–52.

9) Pereira D, Gross S, Elfering A (2016) Social Stressors at Work, Sleep, and Recovery. Appl Psychophysiol Biofeedback **41**, 93–101.

10) Semmer N, Jacobshagen N, Meier L, Elfering A (2007) Occupational stress research: The Stress-As-Offense-To-Self Perspective. In: Occupational Health Psychology: European Perspectives on Research, Education and Practice, McIntyre S and Houdmont J, 41–58, Nottingham University Press, Nottingham.

11) Semmer NK, Tschan F, Jacobshagen N, Beehr TA, Elfering A, Kälin W, Meier LL (2019) Stress as offense to self: A promising approach comes of age. Occup Health Sci **3**, 205–38.

12) Hobfoll SE (1989) Conservation of Resources: A new attempt at conceptualizing stress. Am Psychol **44**, 513–24.

13) Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB (2001) The job demands-resources model of burnout. J Appl Psychol **86**, 499–512.

14) Pereira D, Elfering A (2014) Social stressors at work and sleep during weekends: the mediating role of psychological detachment. J Occup Health Psychol **19**, 85–95.

15) Pereira D, Mueller P, Elfering A (2015) Workflow interruptions, social stressors from supervisor(s) and attention failure in surgery personnel. Ind Health **53**, 427-33.

16) Travis DJ, Lizano EL, Mor Barak ME (2016) 'I'm So Stressed!': A Longitudinal Model of Stress, Burnout and Engagement among Social Workers in Child Welfare Settings. Br J Soc Work **46**, 1076–95.

17) Zoupanou Z, Rydstedt LW (2019) The mediating and moderating role of affective rumination between work interruptions and well-being. Work **62**, 553–61.

18) Brosschot JF, van der Doef M (2006) Daily worrying and somatic health complaints: Testing the effectiveness of a simple worry reduction intervention. Health Psychol **21**, 19–31.

19) Kim H, Ji J, Kao D (2011) Burnout and physical health among social workers: A three-year longitudinal study. Soc Work **56**, 258–68.

20) Walsh L, Turner S, Lines S, Hussey L (2005) The incidence of work-related illness in the UK health and social work sector: The Health and Occupation Reporting network 2002-2003. Occup Med **55**, 262–7.

21) Borrego-Alés Y, Vázquez-Aguado O, Orgambídez-Ramos A (2020) Analysis of the Occupational Health of a Group of Social Workers. In: Qualitative and Quantitative Models in Socio-Economic Systems and Social Work (Eds.), 63–72, Springer International Publishing, Cham.

22) Ravalier JM (2019) Psycho-Social Working Conditions and Stress in UK Social Workers. Br J Soc Work **49**, 371–90.

23) Velez MJ, Neves P (2016) Abusive supervision, psychosomatic symptoms, and deviance: Can job autonomy make a difference? J Occup Health Psychol **21**, 322–33.

24) Montano D (2016) Supervisor behaviour and its associations with employees' health in Europe. Int Arch Occup Environ Health **89**, 289–98.

25) Dickerson SS, Kemeny ME (2004) Acute stressors and cortisol responses: a theoretical integration and synthesis of laboratory research. Psychol Bull **130**, 355–91.

26) Berset M, Elfering A, Lüthy S, Lüthi S, Semmer NK (2011) Work stressors and impaired sleep: rumination as a mediator. Stress Health **27**, e71–82.

27) Nolen-Hoeksema S, Wisco BE, Lyubomirsky S (2008) Rethinking Rumination. Perspect Psychol Sci **3**, 400–24.

28) Beer OWJ, Phillips R, Quinn CR (2020) Exploring stress, coping, and health outcomes among social workers. Eur J Soc Work, 1–14.

29) Maas CJM, Hox JJ (2005) Sufficient Sample Sizes for Multilevel Modeling. Methodology **1**, 86–92.

30) Frese M, Zapf D (1987) Eine Skala zur Erfassung von so-zialen Stressoren am Arbeitsplatz. Zeitschrift für Arbeitswissenschaft **41**, 134–41. (in German).

31) Mohr G, Rigotti T, Müller A (2005) Irritation - ein Instrument zur Erfassung psychischer Beanspruchung im Arbeitskontext. Skalen- und Itemparameter aus 15 Studien. Zeitschrift für Arbeits- und Organisationspsychologie A&O **49**, 44–8.

32) Syrek CJ, Antoni CH (2014) Unfinished tasks foster rumination and impair sleeping - particularly if leaders have high performance expectations. J Occup **19**, 490–9.

33) Mohr G (1986) Die Erfassung psychischer Befindensbeeinträchtigungen bei Industriearbeitern, Peter Lang, Frankfurt.

34) Serido J, Almeida DM, Wethington E (2004) Chronic stressors and daily hassles: unique and interactive relationships with psychological distress. J Health Soc Behav **45**, 17–33.

35) Ray EB, Miller KI (1994) Social Support, Home/Work Stress, and Burnout: Who can Help? J Appl Behav **30**, 357–73.

36) The R Foundation (2020) The R Project for Statistical Computing. https://www.r-project.org/. Accessed October 4, 2020.

37) Bell A, Fairbrother M, Jones K (2019) Fixed and random effects models: making an informed choice. Qual Quant **53**, 1051–74.

38) Selig JP, Preacher KJ (2008) Monte Carlo method for assessing mediation: An interactive tool for creating confidence intervals for indirect effects. http://quantpsy.org/. Accessed December 7, 2020.

39) Tofighi D, MacKinnon DP (2016) Monte Carlo Confidence Intervals for Complex Functions of Indirect Effects. Struct Equ Modeling **23**, 194–205.

40) Nezlek JB (2001) Multilevel Random Coefficient Analyses of Event- and Interval-Contingent Data in Social and Personality Psychology Research. Pers Soc Psychol Bull **27**, 771–85.

41) Cropley M, Dijk D-J, Stanley N (2006) Job strain, work rumination, and sleep in school teachers. Eur J Work Organ Psychol **15**, 181–96.

42) Kinman G, Grant L, Kelly S (2020) 'It's My Secret Space': The Benefits of Mindfulness for Social Workers. Br J Soc Work **50**, 758–77.

43) Demsky CA, Fritz C, Hammer LB, Black AE (2019) Workplace incivility and employee sleep: The role of rumination and recovery experiences. J Occup Health Psychol **24**, 228–40.

44) Ohly S, Sonnentag S, Niessen C, Zapf D (2010) Diary Studies in Organizational Research. J Pers Psychol **9**, 79–93.

45) Donaldson SI, Grant Vallone EJ (2002) Understanding Self-Report Bias in Organizational Behavior Research. J Bus Psychol **17**, 245–60.