What about divorce is stressful? Perceived stress among recently divorced Danes

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Background:

Research in line with the epidemiologic stress tradition has found divorce to be one of the most stressful and prevalent life events during adulthood. Previous research suggests that there are divorce-related and sociodemographic factors that may moderate perceived stress and that the stressful effects of divorce diminish over time (Amato, 2014). We present "real-time" (on average one week after divorce) data evaluating the wide range of factors described in the literature that are associated with higher post-divorce stress.

Objectives:

The study aimed to assess three research questions (RQ):

RQ 1: What are the levels of perceived stress among newly divorced Danish men and women and how do they compare to the general population?

RQ 2: Do divorce-related factors (i.e., infidelity as a motive for the divorce, non-initiator status, longer marriages, not having a new partner, and higher levels of divorce conflict) and socio-demographic variables (i.e., age, income, and education) contribute to higher perceived stress among newly divorced individuals?

RQ 3: Are there differences between recently divorced men and women as to which divorce-related factors (i.e., infidelity as a motive for the divorce, non-initiator status, longer marriages, not having a new partner, and higher levels of divorce conflict) and socio-demographic variables (i.e., age, income, and education) contribute to higher perceived stress?

Methods:

The study utilized an online cross-sectional design and a total of 2,371 Danish citizens recruited through the Danish State Administration from November 2015 to January 2018 as part of a larger Randomized Controlled Trial entitled "Cooperation After Divorce". Baseline data are presented here. Amongst others, respondents completed the Perceived Stress Scale (PSS; Eskildsen et al., 2015) and the scores were compared to the Danish background population (Nielsen et al., 2008) using one sample t-tests. Associations between self-perceived stress and sociodemographic factors and characteristics of the divorce were assessed using multiple group structural equation modeling (SEM). SPSS 25.0 and AMOS 22.0 were used for analyses.

Participants

Table 1
Participant sociodemographic information

Variable	Men (n = 810)	Women (n =1561)
Age, years, M (SD)	46.47 (9.13)	44.55 (8.34)**
Education level, %		
Low education level	45.8	34.9**
Medium education level	28.4	40.5
High education level	25.8	24.6
Income, %		
Below the average national monthly salary	27.7	50.2**
Average	47.0	39.9
Above the average national monthly salary	25.9	9.9
Marriage length in years, M (SD)	12.12 (7.91)	12.92 (7.98)ᵃ
Legal divorce duration to response date, M (SD), in daysᵃ	4.57 (7.20)	4.81 (7.37)
Residential separation duration to response date, M (SD) in weeksᵇ	13.49 (16.83)	14.60 (16.79)
Number of times divorced, %		
One time	86.8	87.8
Two times	11.1	10.7
Three times	1.6	1.3
More than three times	0.5	.2
Initiative divorce, %		
Participant	28.5	52.5**
Mutual agreement	20.9	13.7
Former spouse	50.6	33.9
New partner, %		
Both have new partners	5.2	5.6**
Neither have new partners	62.5	62.2
Participant does, former spouse does not	15.1	9.2
Participant does not, former spouse does	17.3	22.9
Number of children, %		
0	5.9	4.1
1	17.7	20.6
2	53.9	51.8
3	19.4	20.6
4 or more	3.1	2.9
Divorce Conflict, %		
Very low	21.6	16.7
Low	21.8	23.3
Moderate	28.3	30.6
High	18.7	18.9
Very high	9.6	10.4
Infidelity, %	23.3	27.9*

Note. a Legal divorce duration was calculated in days from the legal divorce date to survey response date. b Total residential separation duration was calculated in weeks from the date if/when the former spouses no longer resided in the same domicile to survey response date.
* p < .05, ** p < .001

Results:

RQ 1: Both men and women in this study reported significantly higher stress levels than both the Danish national norms (Men: t(769) = 33.28, p < .001, d = 2.40; Women: t(1505) = 44.29, p < .001, d = 2.28)) and the divorced/separated population norms (Men: t(770) = 28.37, p < .001, d = 2.04; Women: t(1505) = 36.03, p < .001, d = 1.86). Women indicated significantly higher stress than men did t(2274) = -4.11, p < .001, d = -.17) (see Figure 1).

RQ 2: Multiple group structural equation modeling assessed which divorce-related and sociodemographic factors contributed to higher perceived stress. In the unconstrained model (see Figure 2), lower age and having more children were significant predictors of higher stress for men but not for women. Infidelity as a motive for divorce significantly predicted higher stress for women but not for men. The model predicted almost the same amount of the variance (14.5%) for women as for men (14.4%).

RQ 3: To assess if there are differences between men and women as to which factors contribute to higher stress, equality constraints were placed on the predictive path of each predictor in the multiple group structural equation model. The model fit was good (see table 2), thus, indicating that these predictors did not significantly differ in strength across male and female participants. Lower age, lower education level, lower income, infidelity, divorces initiated by the former spouse when compared with those initiated by the participant, when neither the participant nor their former spouse had new partners (compared with when both had new partners), when the former spouse had a new partner and the participant did not (when compared with both having new partners) and higher divorce conflict predicted higher stress levels among both male and female participants. These factors explained approximately 14% of the perceived stress level variance (see Figure 3).

Table 2
Goodness-of-fit indexes for multiple group structural equation models (N = 2371)

Model	X²	df	X²/df Ratio	RMSEA (90% CI)	TLI	NFI	CFI
Unconstrained	0.00	0	-	-	1.00	1.00	1.00
Constrained	45.38	14	1.28	.011 (.000 ; .025)	.993	.998	1.00

Note: The constrained model had equality constraints on the effect of each predictor. RMSEA = root mean square error approximation; TFI = Tuuker-Lewis index; NFI = normed fit index; CFI = comparative fit index.

Discussion:

The participants in this study reported significantly higher perceived stress than the national norms of both general and divorced/separated populations. As research suggests that the stressful effects of divorce diminish over time, these differences could be due to an effect of time. Participants responded on average within one week of legal divorce, which is closer than those in the data used for comparison (Nielsen et al., 2008).

We found that there were no gender differences in which factors were significantly associated with perceived stress levels. This is important because while women in our study report higher stress, and this is consistent with the research literature (e.g. Dahl et al., 2015; Leopold & Kalmijn, 2016; Nielsen et al., 2008; Perrig-Chiello et al., 2015), which socio-demographic and divorce-related factors contribute to stress are not different for men and women. This implies that men and women are affected by and respond to the factors that can contribute to stress in a similar way. Moreover, this finding may contribute to the gender similarities hypothesis, which specifies that men and women are similar regarding most psychological dimensions (Hyde, 2005).

While the predictive strength of the factors did not differ by gender, we did find that women report higher mean levels of stress than do men. This mean difference may be because women may have more or report higher levels of factors that are associated with higher stress. For example, in this study, more women indicated infidelity as a motive for divorce and women reported significantly lower income and age, all three of which were found to be significant predictors of higher perceived stress. This suggests that while what factors predict stress during a divorce do not differ between men and women, women in our study had higher levels of factors which are associated with higher stress.
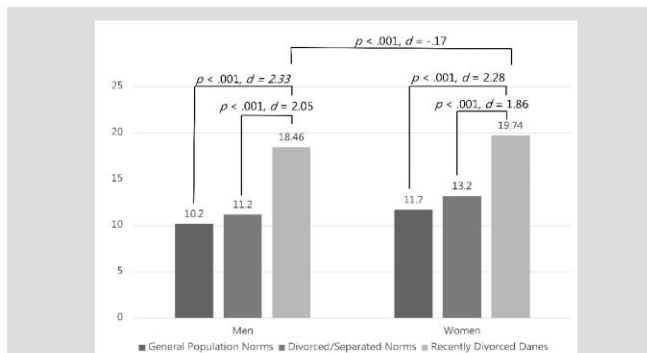

Figure 1
Perceived stress mean scores of recently divorced Danes compared with general population and divorced/separated norm data (N = 2371, men n = 810, women n = 1561).
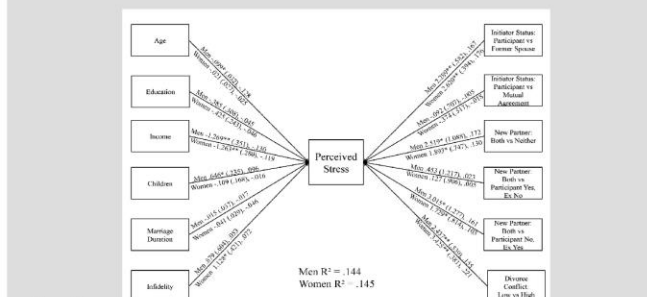

Figure 2
Multiple group structural equation model showing the effects of socio-demographic and divorce-related variables on perceived stress among men and women. * p < .05, ** p < .001. Regression weights, standard errors (parenthesized), and standardized regression weights are shown.
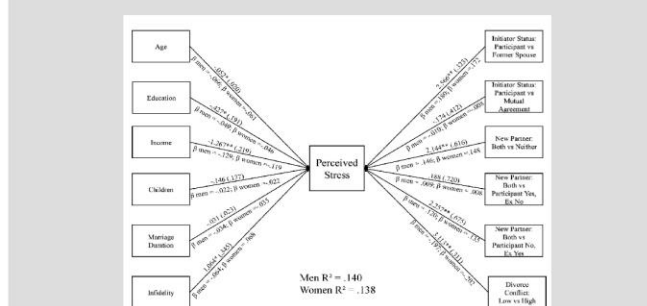

Figure 3
Multiple group structural equation model with equality constraints on the effect of each sociodemographic and divorce-related predictor on perceived stress among men and women.

* p < .05, ** p < .001. Regression weights, standard errors (parenthesized) are shown above each pathway. Standardized regression weights for men and women are shown below each pathway.

Conclusions:

Both male and female participants in this study had significantly higher perceived stress levels than the general population and divorced/separated populations. Lower age, lower education level, lower income, infidelity as a motive for divorce, former spouse divorce initiation, not having a new partner, and higher divorce conflict significantly predicted higher stress levels among male and female participants. Given former research showing that increased levels of stress have a detrimental effect on a variety of health-related outcomes, the results imply that special stress- and health attending intervention strategies should be considered for recently divorced people.

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Protocol for systematic review on the association between long working hours and risk of depression

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BACKGROUND

The World Health Organization (WHO) and the International Labour Organization (ILO) are developing a joint methodology for estimating the work-related burden of disease and injury. Long working hours and depression is one of 13 new prioritized risk factor-outcome pairs with similar methodology used among all pairs. We developed a protocol for systematically reviewing the association between long working hours and risk of depression.

METHODS

WHO and ILO gathered a review team of 22 experts from 9 countries (Australia, China, Denmark, France, Germany, Italy, Japan, Spain, Switzerland). Led by WHO and ILO and supported by external experts on review methodology, the review team members jointly developed the protocol for data search, study selection, risk of bias assessment, synthesis of results and quality and strength of evidence assessment.

OUTLOOK

We expect that the results will be available late 2019.

RESULTS

We developed a protocol that includes:

- *Search* in 7 academic and 2 grey literature databases, 2 internet search engines and 6 organizational websites plus extensive hand search and expert consultations

- *Screening* of records by at least 2 review group members applying pre-specified eligibility criteria

- *Risk of bias assessment* with the Navigation Guide methodology applying 9 risk of bias domains

- *Pooling effect estimates* using inverse variance meta-analysis if at least 2 estimates are judged as sufficiently homogenous

- *Sub-group meta-analyses* if applicable

- *Quality of evidence assessment* using a modified version of the Navigation Guide quality of evidence assessment

- *Strengths of evidence assessment* using the standard Navigation Guide methodology to rate the strength of evidence.

REFERENCE

Rugulies, R., Ando, E., Ayuso-Mateos, J. L., Bonafede, M., Cabello, M., Di Tecco, C., ... & Zadow, A. (2019). WHO/ILO work-related burden of disease and injury: Protocol for systematic reviews of exposure to long working hours and of the effect of exposure to long working hours on depression. *Environment international*.

Det Nationale Forskningscenter
for Arbejdsmiljø

Study protocol:

Determinants of stress - the relative importance of work- and non-work-related stressors in Danish adults

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Background

Work-related stress has received much attention in the research literature. However, the relative importance of work- and non-work-related stressors on stress level has received less attention.

Aim

Our research project consists of three studies focusing on different aspects of the link between level of stress and work- and non-work-related stressors.

Methods

The studies use data from the population-based health survey "How are you?" carried out in 2013 and 2017 in Central Denmark Region.

Study 1 & 3. Respondents aged 16 years or older in 2013 or 2017 (N=33,285 and N=32,417).

Study 2. Panel data from respondents, who participated in both 2013 and the 2017 surveys (N=10,203).
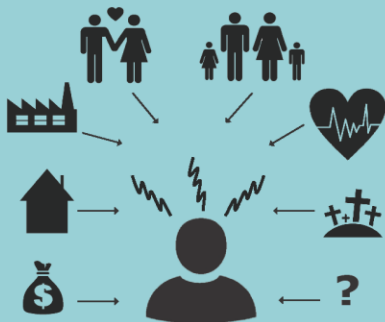
Stress level. Perceived Stress Scale (PSS).

Stressors. Financial circumcumstances, housing conditions, work situation, relationship with partner, family and friends, disease, disease and deaths among close relatives, and "other" types of distress.

Work-related stressors. Amount of work, influence, work-life conflicts, positive feedback, job satisfaction, physical and mental strain, and physical loads.

Furthermore, **social relations** and **social support** are also assessed in the surveys.

Study 1

Aim. To determine the relative importance of work- and non-work-related stressors on stress at population level.

Analysis. Regression models with PSS as the dependent variable and work- and non-work-related stressors as independent variables. Dominance analysis for determining the relative importance of the various stressors.

**Knowledge.** Which stressors and combinations of stressors offer the largest potential for preventing or reducing stress.
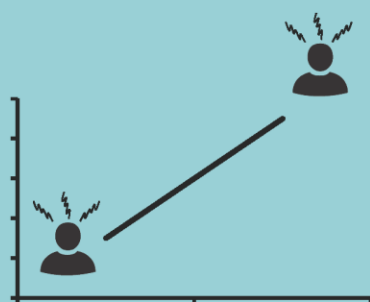
Study 2

Aim. To determine how much of the observed increase in stress at population level from 2013 to 2017 that can be explained by changes in work- and non-work-related stressors.

Analysis. Fixed effects and random effects regression models for causal interpretation of panel data.

Knowledge. Which stressors have contributed most to the observed increase in stress from 2013 to 2017.
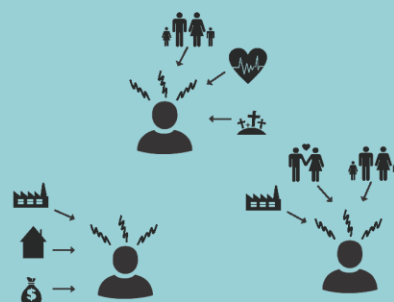
Study 3

Aim. To identify sub-populations with different stressor-profiles, and to compare stress levels among these sub-populations.

Analysis. Latent class analysis for creating meaningful sub-populations determined by stressors. Latent classes are used in a regression model as independent variables with PSS as dependent variable.

Knowledge. Identification of high risk groups in terms of developing high levels of stress.

Case-crossover study of shift work and risk of occupational, transport and leisure-time injury

Helena B. **Nielsen**[1], Johnny Dyreborg[1], Åse M. Hansen[1,2], Johnni Hansen[3], Henrik A. Kolstad[4], Ann D. Larsen[1], Kirsten Nabe-Nielsen[2], Anne H. Garde[1,2]

National Research Centre for the Working Environment

Aim: To study the associations between evening shifts, night shifts and quick returns, and risk of occupational, transport and leisure-time injuries.
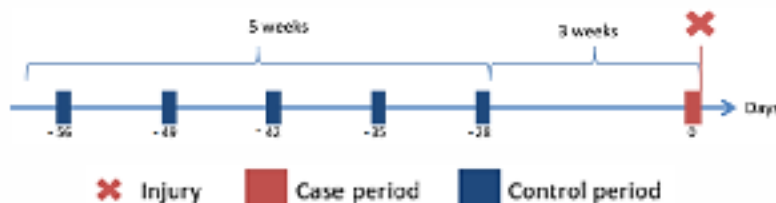
Findings

Evening and night shifts

Quick returns

Injuries: ● Occupational ● Transport ● Commuting ● Leisure-time
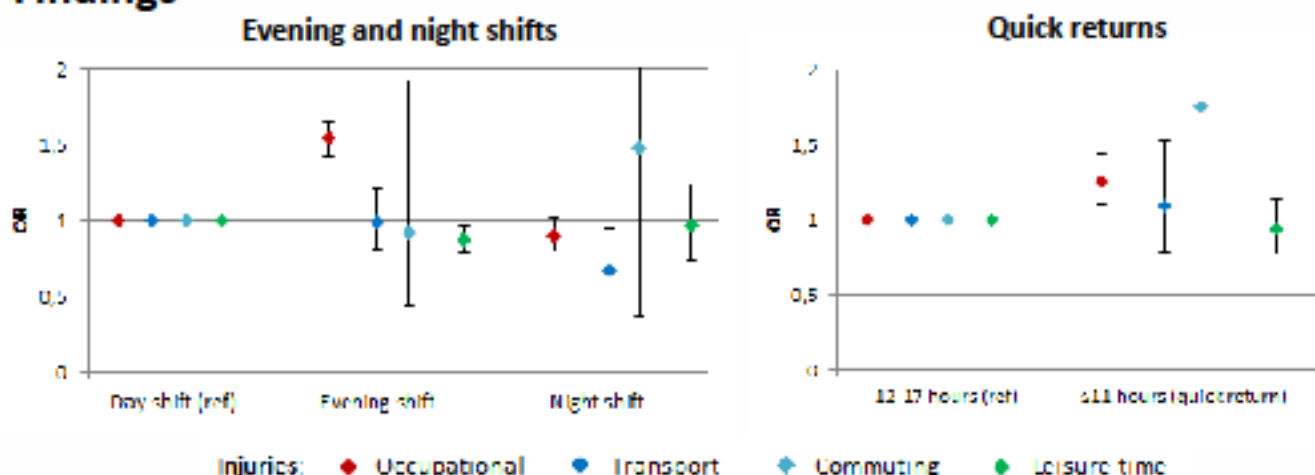
Method

Shift information was derived from the Danish Working Hour Database and linked to information on injuries from The National Patient Register. We used a case-crossover design and the study populations included a total of 13 337 occupational injuries, 2722 transport injuries and 9768 leisure-time injuries.

✖ Injury   ▮ Case period   ▮ Control period

Conclusion

Our findings support the evidence of:

* A higher risk of occupational injuries during evening shifts and after quick returns
* Findings on leisure-time transport and commuting injuries were inconclusive
* No support for a higher risk of injury during leisure-time after evening shifts, night shifts or quick returns.

Permanent night work and circadian disruption - study design

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BACKGROUND

- Work at night implies a disturbance between behavioral and biological rhythms
- Work at night leads to circadian disruption, melatonin suppression, and a lack of coordination between diurnal rhythms.

- Current recommendations is to reduce the number of consecutive night shifts to minimize circadian disruption and sleep debt.

- However, some workers prefer permanent night work with several consecutive night shifts.

- Existing knowledge on the physiological effects of night work has primary been found in studies with rotating or mixed night work.
- There is a lack of knowledge on effects on circadian rhythms and sleep in relation to permanent night work.

> **Aim:** To compare circadian disruption among permanent night workers and rotation night workers (data from our previous study)
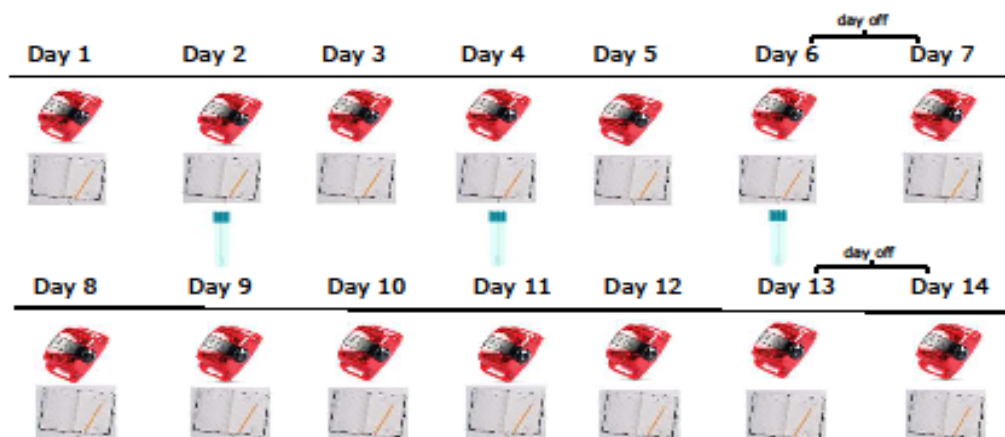
DESIGN

Figure 1: Process for data collection. Effects of night work are assessed during 2 weeks of work and days off among 100 non-smoking men with permanent night work. The effects are assessed by questionnaires, sleep measurements (actigraphs and sleep diaries) and saliva samples (to measure circadian rhythms of melatonin, testosterone and cortisol).

The data will be compared with data from our previous study "In the middle of the night" which involved rotating night workers.

Preliminary Results

Influence at work between self-management and performance management: a mixed methods study

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Purpose

The study aims to expand the term influence at work. We combine quantitative tests of associations between level of self-reported influence at work and mental wellbeing with qualitative studies of workplace's organisational frameworks.

The study will yield new knowledge on the experience, meaning, and effects of influence at work in contemporary work life, with a particular emphasis on the importance of contextual factors.

Expanding our understanding of influence at work is important in order to address stressors in contemporary Danish work places effectively.

Preliminary Results

Preliminary findings indicate a positive association between influence at work and psychological well-being. We find a tendency that the strength of the association may decrease at higher levels of influence at work.

Preliminary findings from field research show respondents across job groups link influence at work to core task, management systems, and IT-based management tools. Indications toward a reciprocal and dialogical relationship between influence at work, core task, and mental wellbeing.
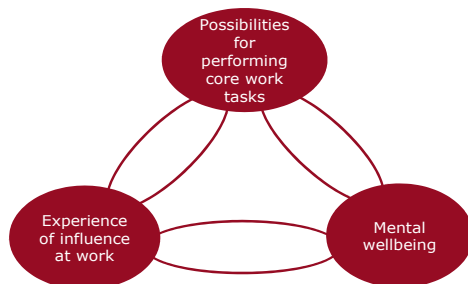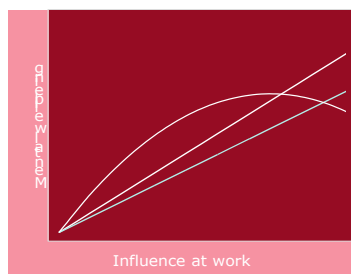
Mixed Methods

We test 1) possible non-linearity between influence at work, mental wellbeing, and self-reported stress quantitatively in NRCWE's 2015 DPQ-survey on psycho-social work environment (baseline n=4340, 6 months follow up n=2540) in 14 job groups, and 2) whether a high degree of influence at work entails higher possibilities for performing work tasks, higher mental wellbeing, and lower self-reported stress.

We contextualise influence at work in relation to local management tools. Three to four months of fieldwork in two different job groups, including 75 interviews, with additional six focus groups, and seven interviews with managers covering six job groups.

**National Research Centre
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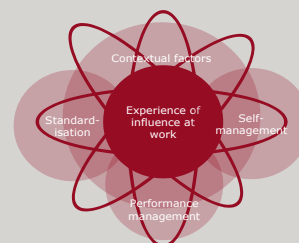
Workplace sexual harassment and gender harassment: a qualitative pilot-study

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Sexual harassment

Gender harassment

Unwanted sexual attention

Sexual coercion

Background

Gender harassment refers to a broad range of verbal and nonverbal behaviours not aimed at individuals. It may for instance consist of sexist jokes or condescending remarks related to gender, which could be experienced as harassing in some contexts while not in others. In this pilot-study, we explore how gender harassment is linked with, and how it differs from, other types of sexual harassment occurring in Danish workplaces.

Methods

We analyse qualitative data collected during semi-structured interviews with key stakeholders in workplace sexual harassment prevention, e.g. representatives of unions and employers' organisations about workplace efforts to prevent and manage sexual and gender harassment. We focus on job groups dominated by one gender.

Preliminary results

Workplace culture is a key factor to understand gender harassment. Gender and sexual minorities experience gender harassment to a greater extent.

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The effect of psychosocial work stressors on headache

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1) Department of Public Health, University of Copenhagen, Denmark; 2) Department of Psychology, University of Copenhagen; 3) The National Research Centre for the Working Environment, Denmark; 4) Research unit of Clinical Epidemiology, Institute of Clinical Research, University of Southern Denmark; 5) Center for Clinical Epidemiology, Odense University Hospital; 6) Danish Knowledge Center for Headache, Danish Headache Center, Rigshospitalet-Glostrup, Copenhagen, Denmark

BACKGROUND AND AIM

In the general working population, 29% of men and 45% of women have experienced headache within the past two weeks. Psychological stress have been shown to increase the risk of headache. Still, previous studies on work-related stress and headache could be biased by overreporting of psychosocial work stressors (PSW) by employees with or in higher risk of headache.

In the current study, we investigated the cross-sectional and longitudinal association between PSW and the risk of headache. To contribute to the existing literature, we applied measures of PSW that were aggregated at the work-unit level as well as individual measures of PSW.

We hypothesized that PSW affected the occurrence of headache. Yet, we expected to observe a stronger association between headache and individual measures of PSW than work-unit measures of PSW. As psychological stress may have a relatively acute effect on headache, we also expected a stronger associations in our cross-sectional analyses than in the longitudinal analyses.

CONCLUSION

We found partial support for our hypothesis of an effect of PSW on the occurrence of headache.

Across all analytical approaches (i.e. work-unit/individual PSW measures and cross-sectional/longitudinal analyses), **low decision latitude** and poor social relations in terms of **bullying**, appeared to have the strongest effect on headache. Also, **effort-reward imbalance** may play a role, although the findings were not fully consistent.

Figure 1

OR's and 95% CI for the cross-sectional association between work-unit measures of PSW and headache

Figure 2

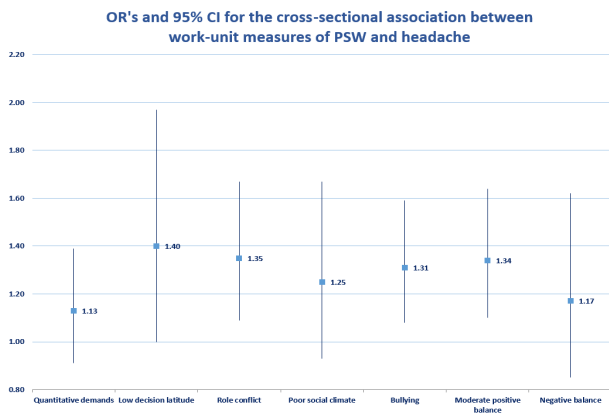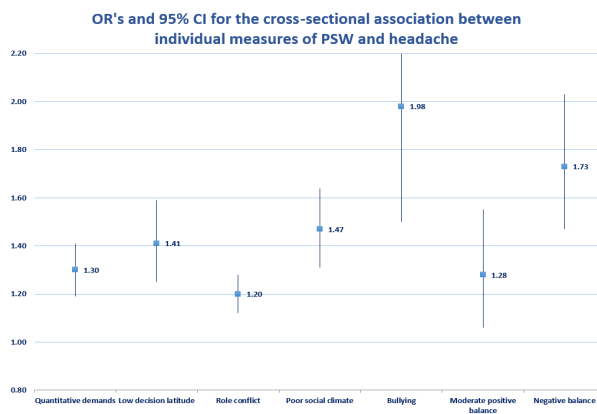OR's and 95% CI for the cross-sectional association between individual measures of PSW and headache

Figure 1 and 2: The figures illustrate the cross-sectional association between headache and the continuous measures of quantitative demands, low decision latitude, role conflict and poor social climate as well as the categorical measures of bullying (vs. no bullying), and a moderate positive and a negative balance between efforts and rewards (vs. a positive balance). OR for the continuous measures indicates the effect of a one-unit increase of the exposure. OR = Odds ratio. 95% CI = 95% Confidence Intervals.

RESULTS

Cross-sectional analyses: We observed that all work-unit measures of PSW pointed towards an association with the occurrence of headache, although the confidence intervals were wide (Figure 1). When we applied individual measures of PSW, the estimated associations with headache became stronger (Figure 2).

Longitudinal analyses: These analyses included only participants without headache within the past 4 weeks at baseline. None of the work-unit measures of PSW were significantly associated with the occurrence of headache two years later. However, the estimate for low decision latitude remained of a similar magnitude (OR=1.52; 95% CI: 0.75-3.06). When applying the individual measures of PSW, the estimates for low decision latitude, bullying and effort-reward imbalance indicated a higher occurrence of headache two years later, but only the estimate for low decision latitude reached statistical significance (OR=1.30; 95% CI: 1.01-1.66).

MATERIAL AND METHODS

Data source and participants: We used survey data from the Danish PRISME study. Data were collected in 2007 and 2009. In analyses of the work-unit PSW-measures, 2247 participants (mean age: 44.4 years; F: 81.1%) were eligible for the cross sectional analyses and 553 participants (mean age: 46.5 years; F: 73.4%) were eligible for the longitudinal analyses. In analyses of the individual PSW-measures, 4261 (mean age: 44.3 years; F: 78.3%) participants were eligible for the cross sectional analyses, and 942 (mean age: 46.4 years; F: 70.1%) were eligible for the longitudinal analyses.

Covariates: Age, sex and educational level.

Statistical analyses: Data were analyzed using logistic regression, and results are presented as odds ratios (OR) and 95% confidence intervals (CI).

PSYCHOSOCIAL WORK STRESSORS

The PSW were chosen based on results from previous literature.

We applied continuous measures of quantitative demands, low decision latitude, role conflict, and poor social climate.

The following PSW were used as categorical variables:
- Bullying: Bullying vs. No bullying (reference group)
- Balance between efforts and rewards:
    - <0.8: Positive balance (reference group)
    - =0.8 to <1.0: Moderate positive balance
    - =1.0: Negative balance

Work-unit measures of PSW were calculated for each work unit with at least 5 headache-free participants with non-missing information about PSW at baseline. For each of these work units, an average score was calculated for each PSW, and assigned to all employees in that particular work unit.

Individual measures of PSW were calculated for each participant based on their individual responses.

HEADACHE

To what degree have you been bothered by headache during the past 4 weeks? Response options*: Not at all, A little, Moderately, Quite a bit,* and *Very much.* The response options were dichotomized into non-cases with no headache at baseline and cases.

REGION H

Optimizing screening for cognitive impairment in work-related stress: preliminary results

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BACKGROUND

Complaints about concentration and memory (i.e., cognitive) impairment are common among patients with work-related stress. Subjective cognitive complaints, however, may be poorly related to performance on objective neuropsychological tests of cognitive functioning.

It is recommended that **cognitive impairments** are **considered** when managing work-related stress in the clinic, such as counselling about the **optimal time for return-to-work**.

Assessment of cognitive impairment requires time-consuming neuropsychological tests administered by a specialized psychologist, which is not routinely employed when managing patients with stress in the Danish occupational clinics. This poses a problem as it is **unclear whether cognitive complaints properly reflect objectively measured cognitive impairment**.

AIMS

This study aims to optimize screening for cognitive impairment among patients with work-related by evaluating:

• The relation between objective and subjective measures of cognitive function
• The validity and reliability of a screening tool for cognitive impairment
• The links between objectively and subjectively measured cognitive function and symptom severity
• Cognitive function as a determinant of return-to-work among sick-listed patients

Table 1. Distribution of characteristics for the preliminary study sample of patients with work-related stress.

	n (% of N)	Mean (SD)
N	49 (100)	
Sex		
Females	43 (88)	
Males	6 (12)	
Age		46.0 (10.4)
Years of education		15.4 (2.3)
Occupational status		
Sick-listed	29 (59)	
Part-time employed	16 (33)	
Full-time employed	4 (8)	
Stress symptoms (KEDS-9: 20≤54)		30.8 (5.7)
Depressive symptoms (HDRS-6: 0≤8)		5.6 (1.8)
Previous stress episode(s)	24 (49)	0.6 (0.7)

SD = Standard Deviation.
KEDS-9 = Nine-item self-reported Karolinska Exhaustion Disorder Scale.
HDRS-6 = Six-item interview-based Hamilton Depression Rating Scale.

METHODS

This preliminary report is based on the **first 49 patients recruited**.

From March 2019 to February 2020, **we intend to recruit 80 patients** referred to the Department of Occupational and Environmental Medicine, Bispebjerg Hospital, with work-related stress to participate in one 1½-hour assessment. Here, the patients will be assessed for cognitive functioning and symptom severity. All patients will be matched 1:1 to healthy control participants by sex, age, and premorbid verbal intelligence. At 6-month follow-up, the patients will be telephone-interviewed about occupational status.

Subjective cognitive complaints will be assessed with the **self-reported Cognitive and Physical Functioning Questionnaire (CPFQ** composite score of items d-g). Objective cognitive performance will be assessed with the Danish version of the **Screen for Cognitive Impairment in Psychiatry (SCIP-D)** and five standardized neuropsychological tests. The SCIP-D has been validated as a feasible screening tool (≈15 min. administration) in psychiatric patients and it offers five subscale-scores relevant to verbal learning and immediate memory, delayed memory, working memory, verbal fluency, and processing speed. Standardized neuropsychological tests matched to the SCIP-D subtests were included to assess concurrent validity. Total scores for global cognitive functioning will be calculated for the SCIP-D and the standardized neuropsychological tests. In statistical analysis, correlations between measures of cognitive functioning, symptom severity and complaints, and between the SCIP-D and the standardized instruments, were conducted with Pearson's correlation coefficient.

Table 2. Correlation analyses between objective and subjective measures of cognitive function and symptom severity.

	Obj. cognitive performance (est. standardized tests)		Subj. cognitive complaints (CPFQ)	
	r	p	r	p
CPFQ	-0.33	0.02	-	-
SCIP-D total	0.81	<0.01	-0.14	0.35
KEDS-9	-0.40	<0.01	0.34	0.01
HDRS-6	-0.38	<0.01	0.51	<0.01

CPFQ = Seven-item self-reported Cognitive and Physical Functioning Questionnaire (subjective cognitive complaints: composite scores of items d-g).
SCIP-D = Danish version of the Screen for Cognitive Impairment in Psychiatry (total score of the five subscales).
KEDS-9 = Nine-item self-reported Karolinska Exhaustion Disorder Scale.
HDSR-6 = Six-item interview-based Hamilton Depression Rating Scale.

RESULTS

Table 2 shows a weak correlation between objectively and subjectively measured cognitive function, suggesting that the **patients' cognitive complaints poorly reflect their cognitive performance** in a neuropsychological test setting.
There was a very strong correlation between higher objective measures of global cognitive functioning assessed with the standardized neuropsychological tests and the screening tool, SCIP-D. Objective and subjective measures of **cognitive function were** both **moderately correlated with stress and depressive symptoms**.

Table 3 shows moderate-high correlations between each SCIP-D subtest and their matched standardized test(s), **indicating the concurrent validity of the screening tool, SCIP-D**.

Table 3. Correlation analyses between SCIP-D subtests and matched standardized neuropsychological tests.

SCIP-D subtests	Est. standardized tests	r
VLT-I	RAVLT: total scores of I-V	*0.75
WMT	RBANS: DS-F; WAIS-III: LNS	*0.52
VFT	Verbal Fluency S & D	*0.66
VLT-D	RAVLT: total scores of VI-VII	*0.65
PST	TMT-A	*0.53

* p<0.001

SCIP-D subtests
VLT-I = Verbal Learning Test – Immediate.
WMT = Working Memory Test.
VFT = Verbal Fluency Test.
VLT-D = Verbal Learning Test – Delayed.
PST = Processing Speed Test.

Standardized neuropsychological tests
RAVLT = Rey Audio Verbal Learning Test.
RBANS: DS-F = Repeatable Battery for the Assessment of Neuro-psychological Status: Digit-Span Forward.
WAIS-III: LNS = Wechsler's Adult Intelligence Scale, 3rd Ed: Letter-Number Sequencing.
TMT-A = Trail Making Test part A.

DISCUSSION

These preliminary findings among 49 patients with work-related stress suggest that **self-reported subjective cognitive complaints is an insufficient measure of objectively assessed cognitive function**.

The present results also highlight the **concurrent validity of SCIP-D** as a feasible screening tool for assessment of neurocognitive functioning relevant to stress and depressive symptoms displayed by the patients.

All recruited patients are continuously **telephone-interviewed about occupational status at 6-month follow-up** after baseline assessment.

When all baseline data of the patient group is collected, each of the 80 patients will be matched to a healthy control person from a pre-existing data set **to establish SCIP-D cut-off scores for cognitive impairment** for use in a clinical setting.

The research project terminates **August, 2020**.

Det Nationale Forskningscenter for Arbejdsmiljø

MEMORIA: A research project on work-related stressors, perceived stress, and dementia

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BACKGROUND

Dementia is a syndrome involved in multiple diseases with enormous consequences for the patients, their relatives, and the society.

Dementia is strongly age-related. As the average life expectancy in the global population increases, so does the prevalence of dementia.

The incidence of dementia may be reduced by addressing modifiable risk factors, for instance in midlife. Therefore, further knowledge about modifiable risk factors for dementia and vulnerable groups is needed to guide strategies for primary prevention.

Stress has been suggested as a risk factor for dementia. Thus, triggers of psychological stress, such as occupational stressors, and its upstream causes, e.g. low socioeconomic position, are potential targets of such preventive efforts.

AIM

The aim of the MEMORIA project was to investigate whether work-related stressors and perceived stress increased the risk of dementia in old age.

METHODS

Data sources

Exposures were assessed using data from three Danish cohorts:
- The Copenhagen Male Study (1970-71 & 1985-86, N~5,000)
- The Copenhagen City Heart Study (1981-83, N~10,000)
- The Danish Work Environment Cohort Study (1990 & 1995, N~3,000)

The cohort data was linked with national registers containing data on covariates.

Dementia was assessed using data from Danish health registers. Information on diagnosis and medicine was obtained until end of follow-up in 2016.

Exposures
- Long working hours
- Shift work
- Negative social relations at work
- Perceived stress

Dementia
Defined as the first of the following events, occurring after age 60:
- First diagnosis of dementia
- First purchase of dementia medicine

Covariates
Age, sex, education, marital status, comorbidities, and lifestyle factors.

Statistical analyses
We analyzed the data using Poisson regression and estimated incidence rate ratios and 95% confidence intervals.
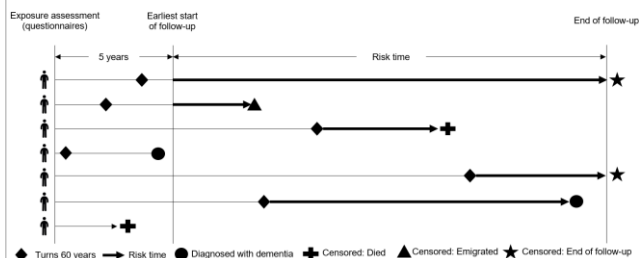

Figure 1: Simplified illustration of the study design used in the majority of studies in the MEMORIA project. Includes the timing of assessment of exposures and risk time.

RESULTS

Long working hours: We found no consistent dose-response relationship between the number of weekly working hours and risk of dementia.

Shift work: Shift work in general was not associated with dementia. Permanent night workers had a higher incidence of dementia compared with permanent day workers.

Negative social relations at work: Limited contact with colleagues was associated with a higher risk of dementia. Our results indicated a higher dementia risk among employees who had experienced prolonged or serious conflicts at work.

Perceived stress: We found a dose-response relationship between the level of perceived stress and risk of dementia.

The results of this project have been reported in six papers and a PhD thesis.

CONCLUSION

Overall, this project demonstrates that work-related stressors and perceived stress may be related to the development of dementia in old age.
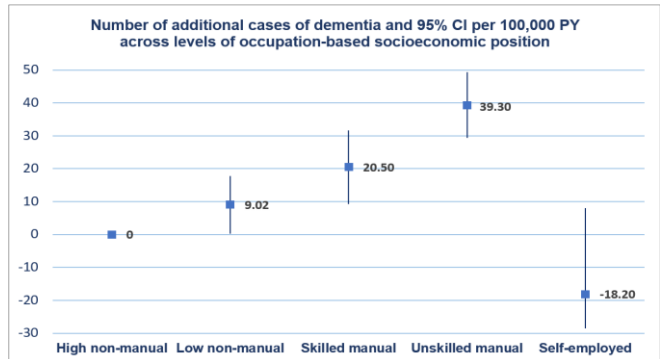

Figure 2: Preliminary results from a study investigating the association between occupation-based socioeconomic position (SEP) and risk of dementia. Dementia risk is reported as number of additional cases in each level of occupation-based SEP compared with the level of high non-manual. Results are adjusted for age, sex, educational level, and marital status. CI = Confidence Interval. PY = person years.