Night work and risk of accidental injuries

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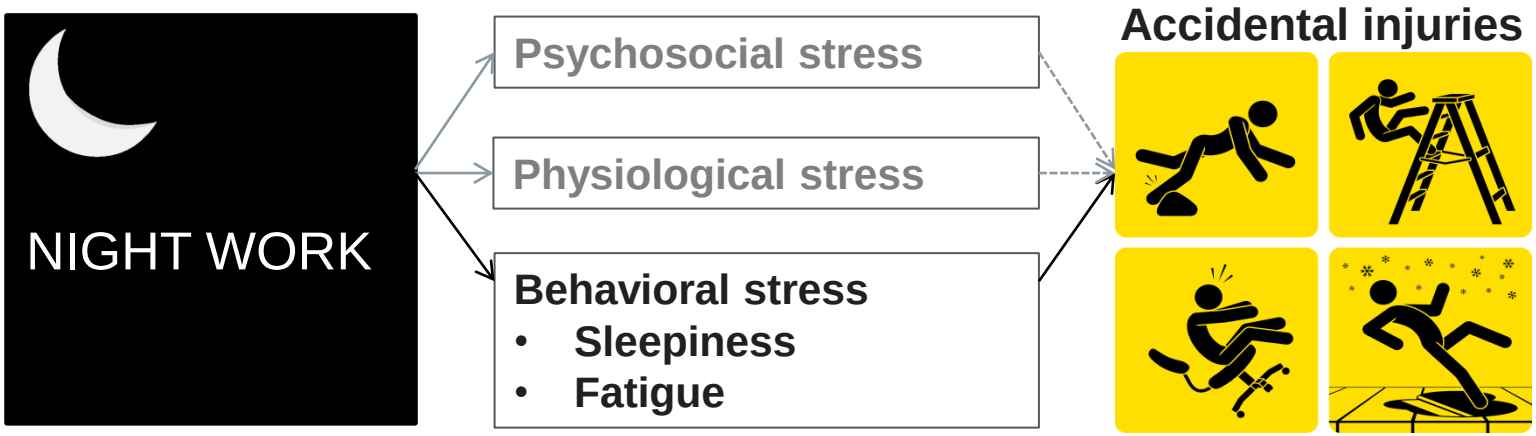
BACKGROUND & AIM



We aimed to investigate the risk of accidental injuries among night shift workers.

Further, to see if the association was affected by age, sex or socioeconomic status (SES).

METHODS

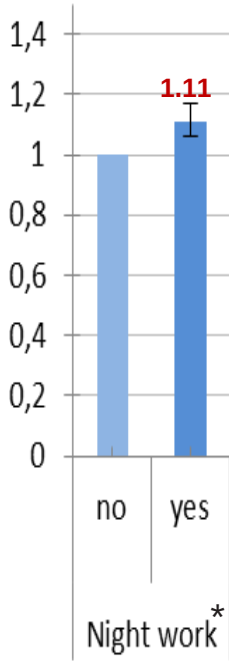
- The Danish part of the European Labour Force Survey (LFS) from 1999–2013, which is based on random samples of 15–74 year old Danes.
- Structured telephone interviews (Statistics Denmark)
- 150 438 participants (53% men).
- EXPOSURE: Night work during the past four weeks (yes/no and regularly/occasionally/no).
- OUTCOMES: Accidental injuires causing hospital contact or death (The National Patient Registry and the Danish Register of Causes of Death).

METHODS

- Poisson regression was used to estimate the relative rates (RR) of accidental injuries as a function of night work, adjusted for relevant covariates.
- Work, commuting and leisure time combined
- The follow-up period for participants were on average 24 months

RESULTS

Rate ratio (RR) (99% CI) for accidental injuries as a function of night work, stratified by age, sex and SES



** Adjusted for year of interview, sex, age, sex^{x}age, weekly working hours, SES and industry.*

- 23 495 cases accidental injuries in 273 700 person years at risk.
- 12.8% were night workers
- Overall test (P<0.0001)
- No two-way interactions between night work and age (P=0.19), sex (P=0.09), or SES (P=0.15).

SUB-ANALYSES

Results from subanalyses showed:

- Among persons interviewed more than once with stable exposure of night work (7685 persons) or no night work (89 826 persons), night work was associated with accidental injuries (RR 1.14, 99% CI 1.06–1.24).
- When dividing night work into regularly (9391 persons) and occasionally (9821 persons) versus no night work (131 226 persons), the rate ratio was highest among those having regularly night work (RR 1.13, 99% CI 1.05–1.20), followed by those having night work occasionally (RR 1.09, 99% CI 1.02–1.17).

CONCLUSION

- Night work was prospectively associated with accidental injuries (RR:1.11; 99% CI: 1.06–1.17)
- Age, sex, and SES could not explain the association when included as two-way interactions.
- Approximately 2300 (95% CI:(1200–3500)) hospital treated injuries per year may be attributed to night work among full-time employees in DK.

Original article

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Night work, long work weeks, and risk of accidental injuries. A register-based study

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No associations were found between long work weeks (>40 hours) and accidental injuries.

PROS and CONS

- Prospective study design
- Protocol-based (Open access, Figshare.com)
- Objective register information on outcomes
- Include both work and spare time
- Large study population – allows us to look at hospital contacts which are much rarer than minor injuries.
- Short follow-up time (<2 years), to reduce risk of changes in work situations
- Randomly selected study population
- Working time information based on self-reports
- Cannot say anything about short-term effects (within days) of night work on accidents.
- No information on smoking, alcohol etc.
- No information on time of day for accidents.

THANK YOU!

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Weekly working hours

Table 2. Rate ratio (RR) with 99% confidence interval (CI) of accidental injuries among Danish employees 2000–2014–2015, as a function of weekly working hours and night work, respectively

Exposure		Hospital contact or death due to accidental injuries			
	Level	Person years at risk	Cases	RR	99% CI
Weekly working hours [a]	>48	16 175	1484	1.02	0.95–1.09
	41–48	27 062	2281	0.96	0.90–1.01
	32–40	230 463	19730	1.00	..
Night work [b]	Yes	34 318	3451	1.11	1.06–1.17
	No	239 383	20044	1.00	..

[a] Adjusted for year of interview, sex, age, night work, socio-economic status and industry.

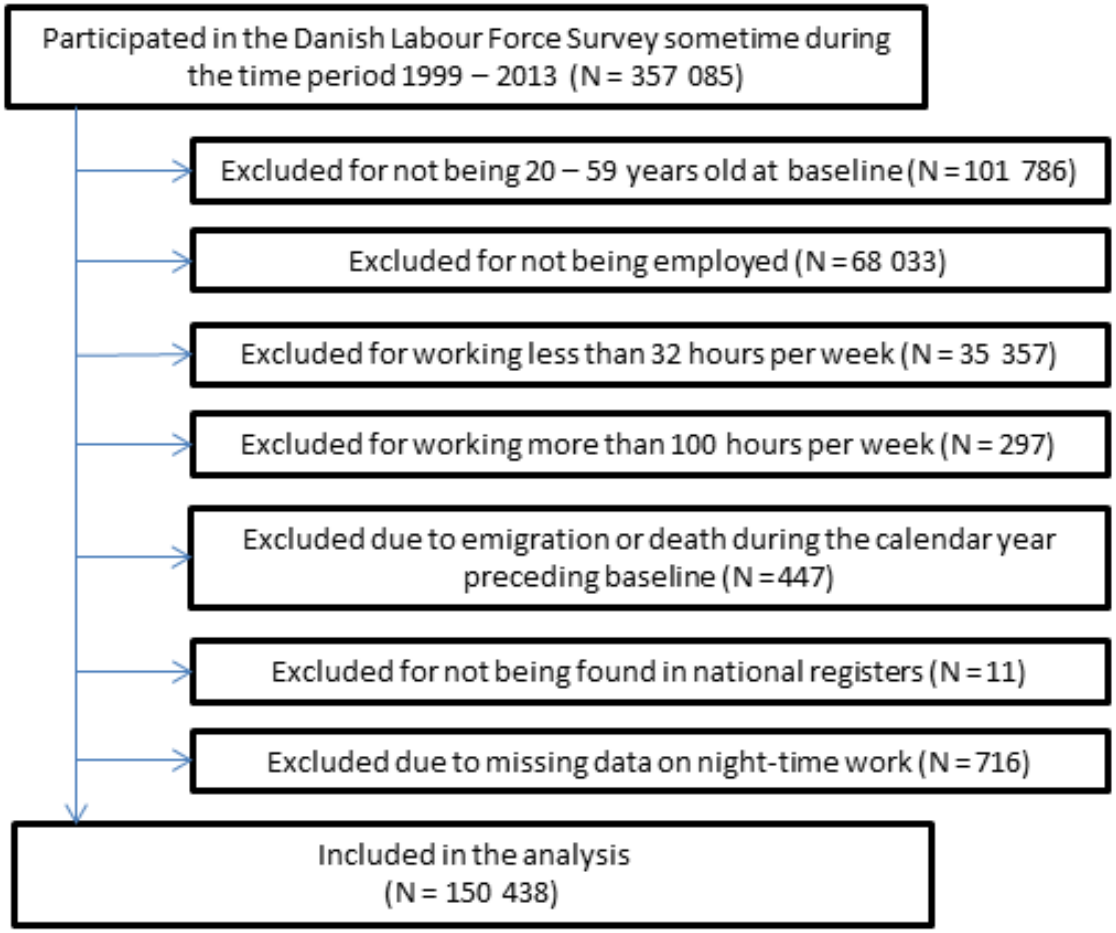
[b] Adjusted for year of interview, sex, age, weekly working hours, socio-economic status and industry.

Table 6. Rate ratio (RR) with 99% confidence interval (CI) for accidental injuries, as a function of weekly working hours among Danish employees 2000–2014–2015, stratified by baseline age group.

Baseline age group (years)	Weekly working hours	Accidental injuries			
		Person years at risk	Cases	RR [a]	99% CI
20–24	>48	783	133	1.01	0.80–1.27
	41–48	1508	216	0.88	0.73–1.05
	32–40	15 141	2424	1.00	..
25–29	>48	1310	186	1.08	0.88–1.32
	41–48	2627	299	0.97	0.83–1.14
	32–40	21 598	2361	1.00	..
30–39	>48	4126	432	1.04	0.91–1.18
	41–48	7530	660	0.93	0.84–1.03
	32–40	61 483	5436	1.00	..
40–49	>48	5263	407	0.97	0.85–1.11
	41–48	8141	652	1.04	0.94–1.16
	32–40	67 097	5000	1.00	..
50–59	>48	4693	326	1.04	0.89–1.20
	41–48	7263	454	0.91	0.80–1.03
	32–40	65 144	4509	1.00	..

[a] Adjusted for year of interview, sex, night work, socio-economic status and industry.

FLOWCHART


Participated in the Danish Labour Force Survey sometime during the time period 1999 – 2013 (N = 357 085)
Excluded for not being 20 – 59 years old at baseline (N = 101 786)
Excluded for not being employed (N = 68 033)
Excluded for working less than 32 hours per week (N = 35 357)
Excluded for working more than 100 hours per week (N = 297)
Excluded due to emigration or death during the calendar year preceding baseline (N = 447)
Excluded for not being found in national registers (N = 11)
Excluded due to missing data on night-time work (N = 716)
Included in the analysis (N = 150 438)

DIAGNOSIS

Clinical endpoint

The endpoint of the primary analyses is defined as hospital treatment with a primary diagnosis code in the interval S00 – T98 (injury, poisoning and certain other consequences of external causes) or death with a primary diagnosis in the interval V01 - Y98 (external causes of morbidity and mortality). It excludes, however, ICD-codes in the interval T80 - T88 and Y40 – Y84 (complications of surgical and medical care, not elsewhere classified). The endpoint encompasses thus the following blocks of ICD-codes for hospital treatment and death respectively:

Hospital treatment codes

S00-S09 Injuries to the head
S10-S19 Injuries to the neck
S20-S29 Injuries to the thorax
S30-S39 Injuries to the abdomen, lower back, lumbar spine and pelvis
S40-S49 Injuries to the shoulder and upper arm
S50-S59 Injuries to the elbow and forearm
S60-S69 Injuries to the wrist and hand
S70-S79 Injuries to the hip and thigh
S80-S89 Injuries to the knee and lower leg
S90-S99 Injuries to the ankle and foot
T00-T07 Injuries involving multiple body regions
T08-T14 Injuries to unspecified part of trunk, limb or body region
T15-T19 Effects of foreign body entering through natural orifice
T20-T32 Burns and corrosions
T33-T35 Frostbite
T36-T50 Poisoning by drugs, medicaments and biological substances
T51-T65 Toxic effects of substances chiefly nonmedicinal as to source
T66-T78 Other and unspecified effects of external causes
T79-T79 Certain early complications of trauma
T90-T98 Sequelae of injuries, of poisoning and of other consequences of external causes

Causes of Death

V01-V99 Transport accidents
W00-X59 Other external causes of accidental injury
X85-Y09 Assault
Y10-Y34 Event of undetermined intent
Y35-Y36 Legal intervention and operations of war
Y85-Y89 Sequelae of external causes of morbidity and mortality
Y90-Y98 Supplementary factors related to causes of morbidity and mortality classified elsewhere