

Fatigue and risk of sickness absence in the working population: A systematic review and meta-analysis of longitudinal studies ¹

by Knar Sagherian, PhD,² Jeanne Geiger-Brown, PhD, Valerie E Rogers, PhD, Emilie Ludeman, MSLIS

1. *Supplementary material*
2. *Correspondence to: Knar Sagherian, College of Nursing, University of Tennessee, 1200 Volunteer Blvd, Knoxville, Knoxville, TN 37996, USA. [E-mail: ksagheri@utk.edu]*

Table S1. Search Strategies

PubMed	(fatigue[tiab] OR "fatigue"[mesh] OR exhaust*[tiab] OR tired*[tiab] OR weariness[tiab] OR burnout[tiab] OR "burnout, professional"[mesh] OR "work schedule tolerance"[mesh]) AND (absent*[tiab] OR absence[tiab] OR absenteeism[mesh] OR sick[tiab] OR sickness[tiab] OR "sick leave"[mesh]) AND (work*[tiab] OR workplace[mesh] OR employ*[tiab] OR job[tiab])
Embase	(fatigue:ab,ti OR fatigue/de OR exhaust*:ab,ti OR exhaustion/de OR tired*:ab,ti OR weariness:ab,ti OR burnout:de,ab,ti) AND (((sick* OR work) NEAR/3 (absen* OR leave*)):ab,ti OR (sick NEXT/1 day*) OR absenteeism:de,ab,ti OR "medical leave":de) AND (work*:de,ab,ti OR employ*:ab,ti OR employee/de OR job:ab,ti) AND ([embase]/lim
CINAHL	(fatigue OR exhaust* OR tired* OR weariness OR burnout) AND (((sick* OR work) N2 (absen* OR leave*)) OR sick day* OR absenteeism) AND (work* OR employ* OR job) <i>Limit to academic journals</i>
PsycINFO	(fatigue OR exhaust* OR tired* OR weariness OR burnout) AND (((sick* OR work) N2 (absen* OR leave*)) OR sick day* OR absenteeism) AND (work* OR employ* OR job) <i>Limit to academic journals</i>
Cochrance CENTRAL	(fatigue OR exhaust* OR tired* OR weariness OR burnout) AND (absent* OR absence OR sick*) AND (work* OR employ* OR job)

Table S2. Methodological rigor of the included studies using the Modified Newcastle-Ottawa Quality Assessment Scale.

	Sagherian et al 2017 (36)	Roelen et al 2015 (31)	Roelen et al 2014 (33)	Roelen et al 2014 (34)	Roelen et al 2013 (35)	Bültmann et al 2013 (7)	Roelen et al 2010 (29)	Akerstedt et al 2007 (37)	De Croon et al 2005 (30)	Bültmann et al 2005 (43)	Mohren et al 2005 (40)	Huibers et al 2004 (41)	Janssen et al 2003 (39)	Andrea et al 2003 (42)	Sluiter et al 2003 (23)	De Croon et al 2003 (38)
Selection																
Representativeness of the fatigued cohort a) truly representative of the average employed adult in the community* b) somewhat representative* c) selected group of users (e.g., nurses, volunteers) d) no description of the derivation of the cohort	0	0	0	0	0	1	0	1	0	1	1	1	1	1	0	0
Selection of the non-fatigued cohort a) drawn from the same community as the exposed cohort* b) drawn from a different source c) no description of the derivation of the non-exposed cohort	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ascertainment of fatigue by a) secure records (e.g. surgical records)* b) structured interview * c) written self-report d) no description	Not scored since it is constant															
Demonstration that the outcome of interest, sickness absence, was not present at the start of the study a) yes, prior/history of SA measured and controlled*	0	1	1	0	1	1	0	0	1	1	0	1	1	1	0	1

b) no																
Comparability																
Comparability of the cohorts on the basis of design or analysis	1	0	1	1	1	1	0	1	1	1	1	1	0	0	0	1
1) study controls for occupational grade/educational level by design or analysis*																
2) study controls for medically-diagnosed or self-report of disease state by design or analysis*	1	0	0	0	0	1	1	0	0	1	1	0	1	1	0	0
Outcome																
Assessment of outcome	1	1	1	1	0	1	1	1	0	1	0	1	1	1	0	0
a) independent blind assessment*																
b) record linkage*																
c) self-report																
d) no assessment																
Was follow-up long enough for outcomes to occur?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
a) yes (6 months)																
b) no																
Adequacy of follow-up of cohorts	1	1	1	1	0	1	1	1	0	1	1	1	1	0	0	0
a) complete follow up (all subjects accounted for)*																
b) subjects lost to follow-up unlikely to introduce bias - small number < 20 % lost to follow-up or description provided of those lost.																
c) follow-up rate $\geq 80\%$ and no description of those lost																
d) no statement																
SUM	6	5	6	5	4	8	5	6	4	8	6	7	7	6	2	4

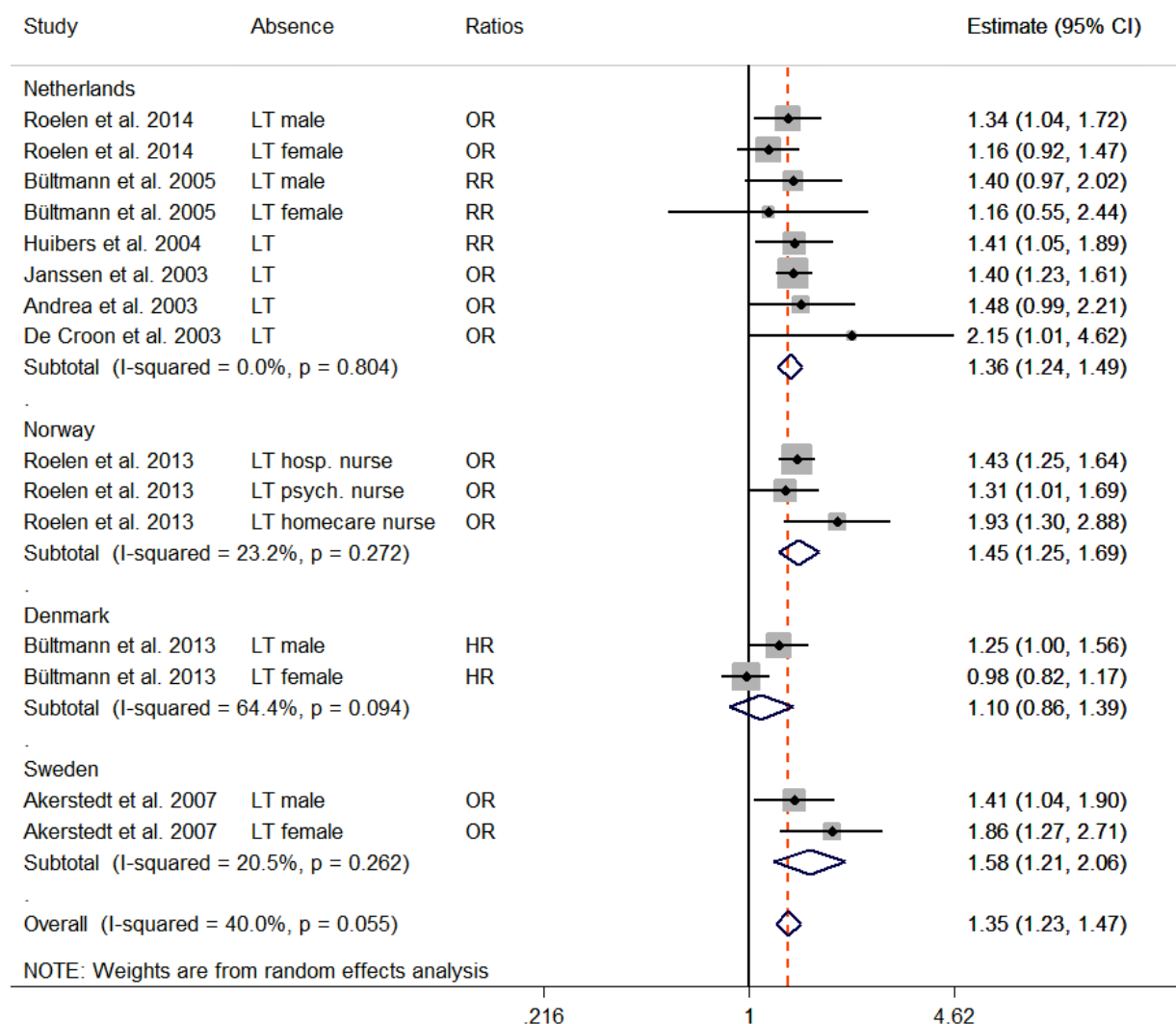


Figure S1. The forest plot represents the meta-analysis of the prospective association between fatigue and long-term (LT) sickness absence (9 studies providing 15 estimates) by country. The risk estimates under the ratios column are odds ratios (OR), relative risk (RR) and hazard ratios (HR).

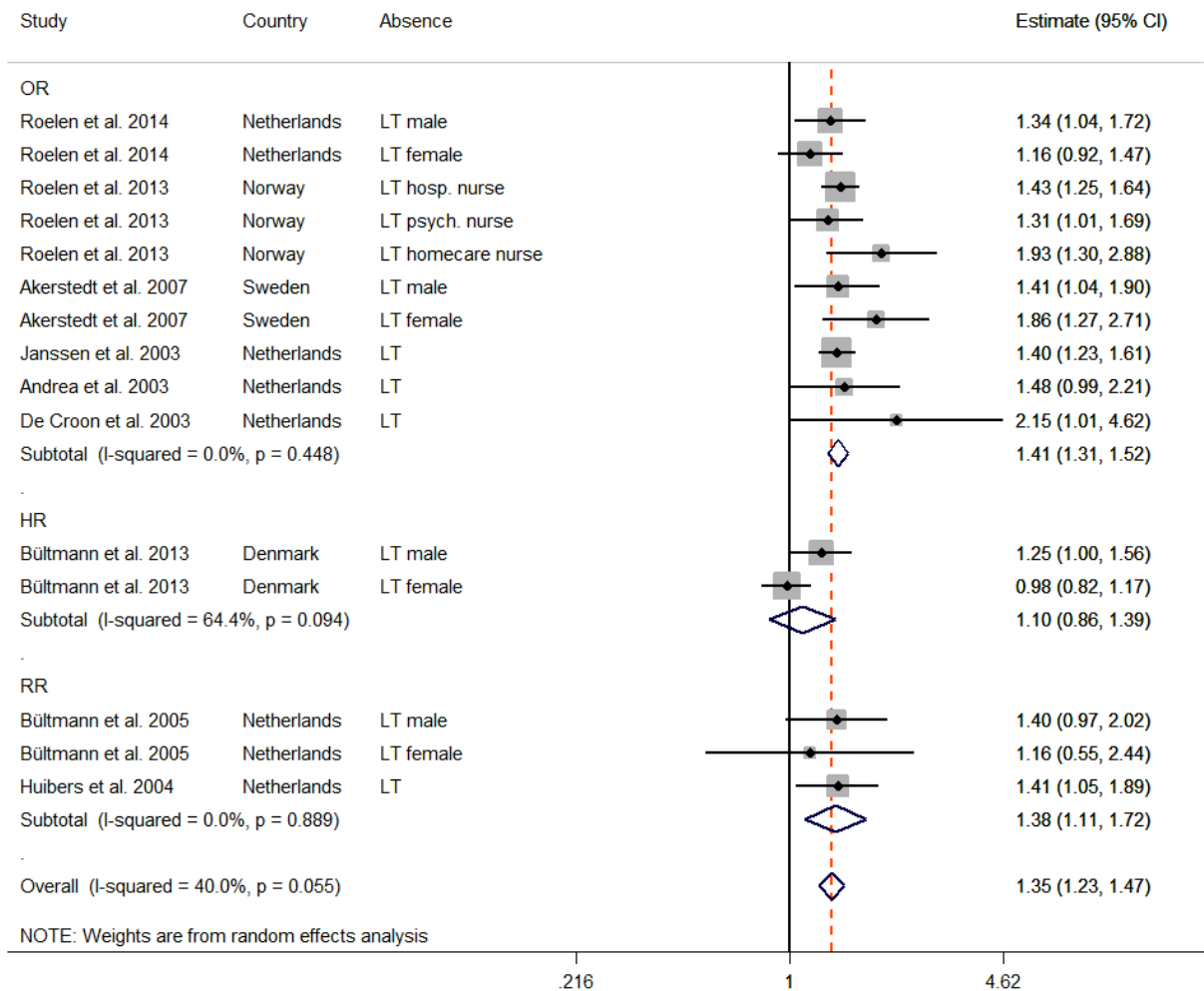


Figure S2. The forest plot represents the meta-analysis of the prospective association between fatigue and long-term (LT) sickness absence (9 studies providing 15 estimates) by risk type. The risk estimates under the ratios column are odds ratios (OR), relative risk (RR) and hazard ratios (HR).