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# **ASSOCIATION BETWEEN FATIGUE AND ERGONOMIC PAIN IN THE DANISH FISHING INDUSTRY**

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# Background

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Ergonomic pain occurs because of improper use of one's own body in relation to his or her environment.

Previous studies have found high burden of ergonomic pain among fishermen

Risk factors for ergonomic pain; heavy workload and risk tasks

Some studies have shown high workload to be a risk factor for fatigue.



*One of the risk tasks is working with back bent forward without support from hands or arms*

# Research Questions & Objectives

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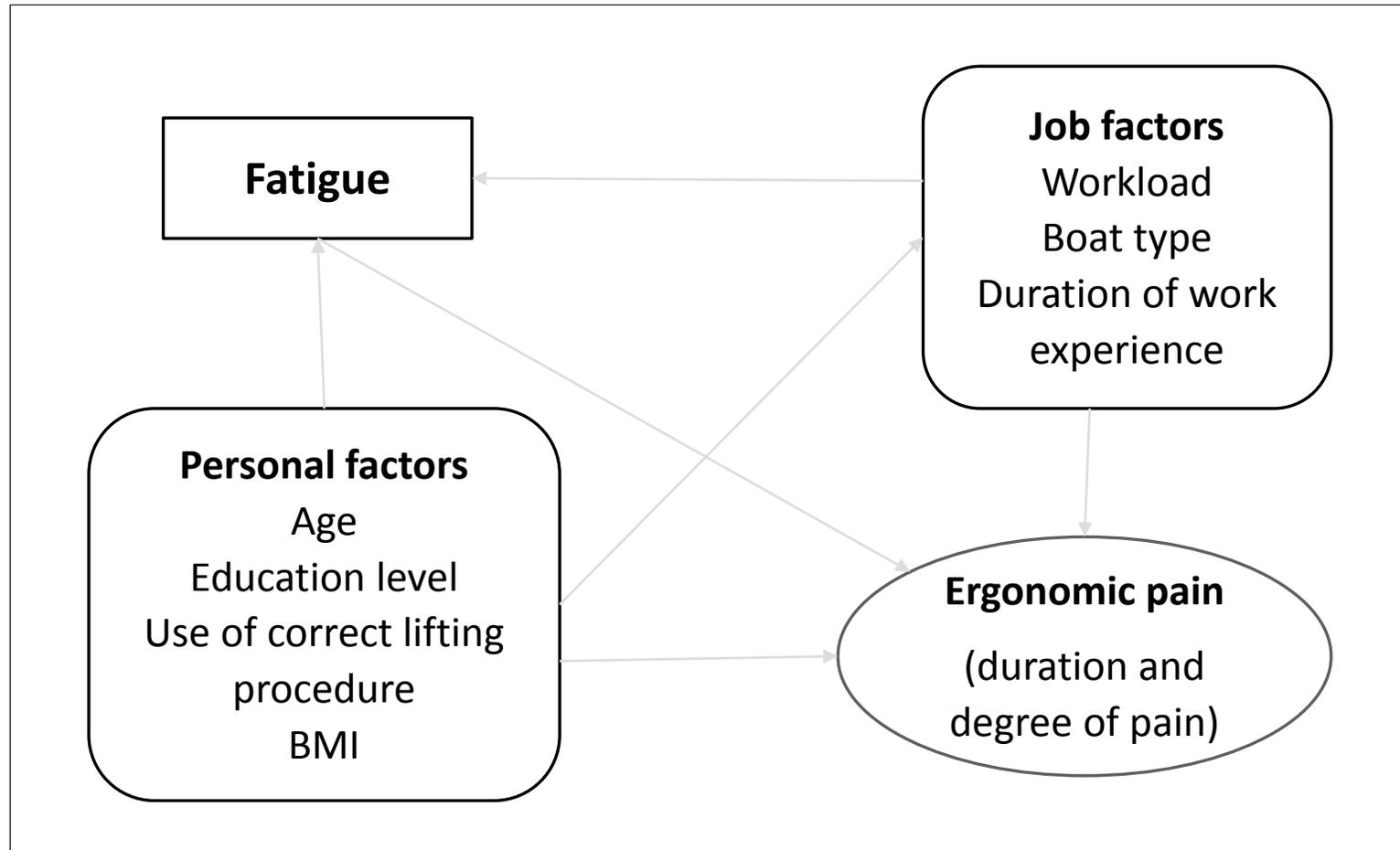
## Research question

Is there an association between fatigue and the prevalence of ergonomic pain in the Danish fishing industry?

## Research objectives

1. To establish the prevalence of ergonomic pain in the Danish fishing industry
2. To assess the association between fatigue and the prevalence of ergonomic pain in the Danish fishing industry

# Conceptual Framework



# Methodology

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Data was obtained from a cross-sectional study in 2015

Danish AgriFish Agency registry → 2,500 full-time active commercial fishermen

A questionnaire was used for data collection

Response rate of 28.5%.

270 full-time active commercial fishermen considered.

STROBE statement used and Approval by Danish Data Protection Agency: Jnr. 2014-41-3245

Analysis: STATAIC 14.2; linear regression and multinomial logistic regression

# Results

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A high prevalence of ergonomic pain among fishermen

Pain in lower back most common (82.13%) with highest degree of pain (mean score 5.17, SE=0.19)

General fatigue highest (mean=9.18, SE=0.22), reduced activity lowest (7.57, SE=0.19)

High workload e.g. carrying and lifting (97.62%), twisting and bending (97.02%)

# Multiple Linear regression: Adjusted and crude models for the association between fatigue and log-transformed overall ergonomic pain scores among respondent fishermen

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	Crude model		Adjusted model		
	$\beta$ (SE)	p-value	$\beta$ (SE)	p-value	Adjusted R <sup>2</sup>
<b>Fatigue</b>					
<b>General</b>	0.0657 (0.0068)	<0.001	0.0451 (0.0070)	<0.001	0.437
<b>Physical</b>	0.0538 (0.0095)	<0.001	0.0277 (0.0079)	0.001	0.367
<b>Mental</b>	0.0336 (0.0094)	<0.001	0.0102 (0.0089)	0.249	0.335
<b>Reduced activity</b>	0.0152 (0.0097)	0.119	0.0023 (0.0092)	0.803	0.331

Adjustment done for workload score, boat type, use of correct lifting procedure and education level

# Multinomial Logistic Regression for Adjusted models for the association between fatigue scores and number of days on which ergonomic pain was experienced by respondent fishermen in the past 12 months

Anatomical site	Category	General fatigue (RRR)	Physical fatigue (RRR)	Mental fatigue (RRR)	Reduced activity (RRR)
Neck	No pain	(Reference)			
	≤30 days	1.1267*	1.0251	1.1158	1.1385*
	>30 days	1.3317***	1.0986*	1.1270	1.0890
Shoulders	No pain	(Reference)			
	≤30 days	1.1799*	1.1304*	1.2622**	1.1102
	>30 days	1.3483***	1.2828**	1.1635	1.1434
Lower back	No pain	(Reference)			
	≤30 days	1.1621*	1.0353	1.1188	0.9479
	>30 days	1.3475***	1.2121*	1.0957	0.9581

Adjustment done for workload score, boat type, use of correct lifting procedure and education level. Only 3 of 9 anatomical sites included in the table.

# Results cont.

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In summary, regression analyses found;

A stronger association between general and physical fatigue and ergonomic pain

A weaker association between mental fatigue and reduced activity and ergonomic pain.

# Discussion

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Similarly high prevalence of ergonomic pain has been found in other studies

Finding supported by high workload with risk work tasks; which has also been found by other studies to be associated with fatigue

Technology and safe work practices have a role to play in the association

Limitations:

- Possibility of reverse association
- Low response rate
- Possibility of responder bias due to self-reporting

# Conclusions

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There is a high prevalence of ergonomic pain among Danish fishermen

The study confirms an association between ergonomic pain and fatigue.

Ways to mitigate ergonomic pain include;

- Interventions targeting fatigue reduction such as workload reduction by further technological advancements for fishing vessels
- Programs targeting safe work practices such as use of correct lifting procedures.

