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Psychosocial Work Environment Risks Among Danish Fishers

Sisse Grøn ^a, Fatima Junaid^b, and Lisa Loloma Froholdt^c

^aAccidents and Safety Culture, The National Research Center for the Working Environment, Copenhagen, Denmark; ^bSchool of Management, Massey University, Palmerston North, New Zealand; ^cCenter for Maritime Health and Safety, University of Southern Denmark, Esbjerg, Denmark

ABSTRACT

Objective: Our paper focuses on psychosocial risks that are under-researched within the fishing industry. The study was conducted in Denmark. Firstly, we investigated how Danish fishers perceive their psychosocial work environment. Secondly, we formed a group of industry partners and stakeholders with the purpose of designing ways to mitigate the reported stressors.

Methods: The study design is action research, employing qualitative co-creative methods for data collection in both the first and the second stages. The methods include chronicle workshops and design thinking workshops. Participants in the workshops came from different stakeholder groups, including fishers. We ensured that the focus remained on centering the voices of the fishers to understand the psychosocial risks within the industry context.

Results: In the first stage, we used thematic analysis, which led to the identification of ten themes: (1) discouragement, (2) stress, (3) poor economy, (4) negative atmosphere, (5) distrust, (6) injustice, (7) fear, (8) unpredictability, (9) powerlessness, and (10) lost pride. This study explored the key risks and highlighted that a lack of influence and meaning, reduced rewards, and increased unpredictability are likely to lead to increased stress in an environment that lacks social support.

Conclusion: Existing research into the psychosocial working environment has established six dimensions where an imbalance leads to negative health effects. They are sometimes referred to as “the 6 gold nuggets” where an imbalance leads to negative health effects. We compared our themes to these gold nuggets and identified a clear overlap, which gave us confidence in the relevance of our data. Through the workshops, we co-created six recommendations to address the reported risks and provide policymakers with actionable recommendations.

KEYWORDS

Action research; Fishers; psychosocial work environment; Well-being

Introduction

Psychosocial risks within the fishing industry have not been extensively researched. Our paper aimed to contribute to the understanding of psychosocial risks in the fishing sector, specifically focusing on the Danish fishing industry



Context of Danish fishing industry

We began by providing context about the fishing industry, followed by the evidence for the lack of research, and finally, outlining the need for our project. Denmark is one of Europe’s largest fishing nations. Since 2000, the industry has seen a 42% decline in the number of fishers, with their mean age rising from 46 to 58 years during the same period. Additionally, the majority of vessels are less than 17 m in size and operated by one to two individuals (1).

This is evident when considering that in 2022, around 1000 fishers were working on 436 vessels in the commercial industry. Similarly, the number of vessels has declined and is now concentrated in fewer ports. Several factors have led to these significant changes in the industry’s structure. Notably, access to British waters through the EU was a cornerstone of the industry until Brexit happened, resulting in a considerable loss of fishing quotas. The fish stocks of several species have declined for several species, and there is increased competition on the water due to the construction of offshore wind turbines and energy islands.¹ Changes in the industry structure have, in turn, created further pressures for the fishers.

Background: psychosocial risks within Danish fishing industry

The Danish Maritime Authority (DMA) monitors, regulates, and audits Danish fishers’ health and

CONTACT Sisse Grøn  smg@nfa.dk  The National Research Center for the Working Environment, NFA, Lersø Parkalle 105, Copenhagen Ø 2100, Denmark

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safety according to the regulations of the International Labour Organisation, the EU, and national work authorities. DMA has established the Fishing Occupational Health Services (FOHS) as a mandatory health and safety professional service, and funds the independent Center for Maritime Health and Society (CMSS), which is tasked with researching the health and safety of all maritime occupations, including fishers. Considering the structural changes and pressures mentioned above, FOHS has raised concerns to CMSS regarding the possible adverse influence on Danish fishers' psychosocial health and well-being, due to psychosocial risks at work.

Psychosocial risks at work encompass aspects of work design, organization, and management, as well as the social and environmental context, that can potentially cause psychological or social harm. These risks can significantly impact both mental and physical health.² This paper is based on a project developed to shed light on these psychosocial risks and suggest ways to mitigate the associated concerns.

There are two key intertwined objectives of our paper. First, to explore the psychosocial risks within the fishing sector; second, we seek to highlight the importance of a contextually empathetic process designed to explore this phenomenon, and present the ways forwards as reported by the stakeholders group. Our project, therefore, consisted of two stages. The first stage involved investigating how Danish fishers perceive their psychosocial work environment and listening to their voices. The second stage focused on forming a group of industry partners and stakeholders with the aim of designing strategies to mitigate the reported psychosocial risks.

Gap

While our research is country-specific and acknowledges the lack of empirical evidence in relation to Danish fishers, there is also a notable dearth of research about the stressors and psychosocial risks in the fishing industry.^{3,4} Thus, we argue that fishers face work and work-related psychosocial risks that need to be researched, understood and mitigated, which is the primary aim of this paper.

Case studies from six countries by the Food and Agriculture Organization indicate fisheries

management has indirect and negative effects on health and safety of fishers.⁵ More than a decade ago, in a comparative study of regulatory regimes of six countries, Windle et al.⁶ found attention to occupational health and safety (OHS) has not been holistically included in fishing regulatory regimes and is often compartmentalized, focusing on administrative responsibility. King et al.⁴ identified "traditional risks", and "modern uncertainties" as stressors. The "traditional risks" include the physically dangerous nature of the job, variable weather, long and unsocial hours of work, self-employment, managing crew dynamics, responding to fluctuating market conditions, and variable catches. King et al. point out that "modern uncertainties" can lead to psychological distress, as fishers have limited capacity to anticipate or manage issues related to increasing regulatory surveillance, oversight, and compliance requirements; reductions, removals, or restructuring of access rights (including intergenerational access); negative representations in the media; and conflicts with other stakeholders. These factors can undermine the reputation and identity of fishers' both individually and as a group. In U.S. fisheries, the increasing regulatory complexity and the economic impact of management decisions have been found to add stress to an already challenging job.⁷ Thus, the aforementioned traditional risks, modern uncertainties, including regulatory complexity, can all be considered psychosocial risks for fishers that need holistic research.

Regulations in the commercial fishing industry in most countries, including the U.S., are designed to ensure the conservation of marine resources. However, many fishers believe their input on conservation is not valued in the fisheries governance process,⁸ which affects their willingness to engage in future discussions. Within the context of Norwegian safety and fishing management, fishers operate under a comprehensive regulatory system aimed at managing resources sustainably. However, Thorvaldsen et al.⁹ found the objectives of safety regulations for fishers do not align with those of fisheries management. We argue that effective governance in fisheries management requires inclusivity and diversity of inputs to avoid unintended negative impacts.

The project

The first author has a long-standing relationship with FOHS. Concerned about the stressors within the fishing sector, FOHS approached the first author. Over the next 6 months, the first author had regular meetings with FOHS and their members (fishers) to discuss ideas for a project design. It was agreed to investigate the issues while simultaneously developing solutions through a co-creation process with fishing industry stakeholders. Psychosocial risk factors provided a holistic yet nuanced overarching theoretical basis for addressing the fishers' stressors.

Methods

Our research utilized an action research design. Action research¹⁰ is an approach in which researchers seek to create changes in the area they are investigating, while simultaneously seeking to create new knowledge. The sub-branches of knowledge mobilization^{11,12} inspired the design. See Figure 1 for an illustration.

We adopted a two-stage approach to the workshops, beginning with chronicle workshops,^{13,14} followed by design thinking co-creation workshops to develop ideas and solutions.¹⁵ We selected chronicle workshops as they allow for an understanding of the historical implementation

and implications of processes (or events) and enable participants to voice their shared experiences within the given context.^{13,14} Through these workshops, we were able to gain insight into the psychosocial risks within the fishing industry. Design thinking enabled the researchers to create solutions that are co-created with the participants based on their experiences.¹⁵ All participants in the workshops were informed about the project and our compliance with GDPR (The EU General Data Protection Regulation) standards and provided verbal consent.

Four chronicle workshops

To investigate the psychosocial risks at work experienced by fishers, we conducted four chronicle workshops. We planned these workshops in collaboration with four of FOHS' safety committees, which are located in fishing communities throughout the country's main fishing areas. The workshops were held in the local areas of each committee. We encouraged the committees to invite other fishers from their region to participate in the workshop, and two of them did. This approach enabled the project group to collect data from fishers and representatives from different fishing communities and several different segments of the industry, as listed in Table 1.

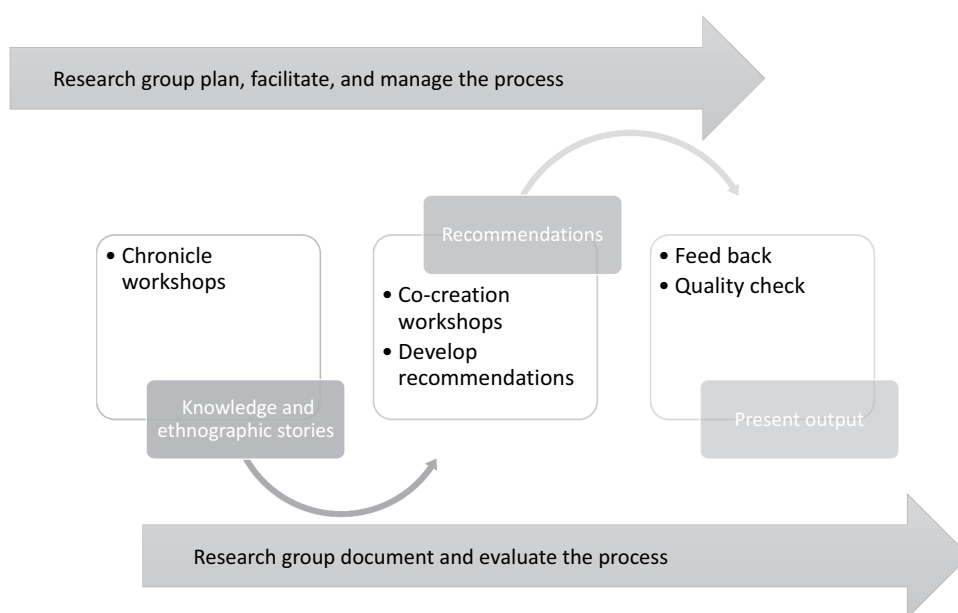


Figure 1. Project design.

Table 1. Chronicle workshops.

Safety committee name	Number of participants	Participants' years of experience	Participants' vessel types	Participants' fishing waters
West	7	30–45	Trawl Boom trawl Net	North Sea Skagerak
North-West	12	13–52	Trawl Net Scrap	Skagerak, Kattegat North Sea Limfjorden
East	12	13–57	Trawl Net Bottom net Drift net Tejn	Little Belt Belt Sea Baltic Sea North Sea Skagerak Kattegat
North	8	7–47	Pelagic trawl Float trawl	North Sea Atlantic ocean

The project group planned, facilitated, and documented the workshops. This included note-taking, photography, and large collages created by the participants as outputs of the workshops. The workshops lasted a full day, and the questions we asked were as follows: (1) What significant events occurred in the fishing industry in the last 10 years? (2) Who were the significant actors in the fishing industry during this period? (3) What were the consequences [of (1) and (2)]? Participants

wrote their answers on post-it notes and placed them on the timeline, and discussed how these notes might be grouped and named. This approach is consistent with the chronicle workshop method.^{13,14} The resulting narratives were very similar across the four workshops.

After each workshop, a case report documenting the process and outputs was shared with the participants. Thematic analysis was used¹⁶ for the data collected from the chronicle workshops, which included the post-it notes, the project group's written notes, and photos of the timeline. While we did not explicitly ask for psychosocial risks, the answers to Q3 provided insights into these risks at work, and descriptions of how participants perceive the negative effects of the psychosocial risks, which serve as the data for this paper. We sorted the responses into piles, and consulted the notes for explanations and context regarding the statements on the post-it notes. This resulted in ten themes (see Table 2).

Three co-creation workshops

Next, we conducted three one-day workshops, aimed at finding ways to address the psychosocial risks. Participants in these workshops

Table 2. Risk factors in the fishers' own words.

Risk factors		
<p>1. Discouragement</p> <ul style="list-style-type: none"> ● You can never do the right thing ● No motivation ● Lack of spirit ● Wanting to stop fishing ● Discouragement ● Discouragement ● Meaninglessness 	<p>4. Bad atmosphere</p> <ul style="list-style-type: none"> ● Negative atmosphere in fishery ● Bad mood <p>5. Distrust</p> <ul style="list-style-type: none"> ● Distrust ● Lost trust 	<p>8. Unpredictability</p> <ul style="list-style-type: none"> ● Unknown future/no future ● Uncertainty ● Hard to plan
<p>2. Stress</p> <ul style="list-style-type: none"> ● Bad health ● Stress ● Stress for the captain 	<p>6. Injustice</p> <ul style="list-style-type: none"> ● Injustice ● Unfairness and injustice ● Injustice 	<p>9. Powerlessness</p> <ul style="list-style-type: none"> ● Powerless ● Frustration ● Powerless ● Powerlessness ● Powerlessness
<p>3. Bad economy</p> <ul style="list-style-type: none"> ● Worthless vessels and gear ● Economy and fuel ● Bad economy 	<p>7. Fear</p> <ul style="list-style-type: none"> ● Criminalization ● Fear ● Nervousness ● Human error 	<p>10. Lost pride</p> <ul style="list-style-type: none"> ● Lack of reason for existence ● Marginalization ● Shaming and bad reputation ● Lost pride

included representatives from DMA, FOHS, the Ministry of Food, Agriculture, and Fisheries, The Danish Fishers PO, The Danish Pelagic PO, the 3F trade union, and the Ocean Institute. During the workshops, participants worked in groups to “translate” methods and knowledge from research on the psychosocial working environment into the context of the fishing industry, recommending measures to mitigate psychosocial risks. The workshops were planned, facilitated, and documented in the same manner as the chronicle workshops. To maintain consistency, after each workshop, the project group wrote a report of the process and output, which was then shared it with the participants.

Results

In the co-creation workshops, we collated the output and found several recommendations that we deemed contextually relevant and suitable. We present these recommendations and themes below.

Similar statements were grouped together; if a word appeared several times, it indicated multiple participants had mentioned it. The more frequently a word appeared, the more people noted it. Later, similar statements were aggregated into themes, resulting in ten themes (shown in the table below): (1) discouragement, (2) stress, (3) poor economy, (4) negative atmosphere, (5) distrust, (6) injustice, (7) fear, (8) unpredictability, (9) powerlessness, and (10) lost pride.

Within the Danish context, research into the psychosocial working environment has established six dimensions where an imbalance can lead to negative health effects. These dimensions are sometimes referred to as “the six gold nuggets” in the Copenhagen Stress Model.^{17,18} The gold nuggets model of stress has received substantial research support, and its dimensions are (1) Demands, (2) Degree of influence, (3) Degree of meaning, (4) Degree of predictability, (5) Effort/reward, and (6) Degree of social support. In this article, we integrate our data into the six gold nuggets framework, enabling a nuanced analysis and extending the existing literature on the framework. Our thematic analysis interestingly reveals several overlaps with the “gold nuggets”.

Therefore, we present our thematic analysis in comparison to the gold nuggets (see Table 3), which is further elaborated upon below.

- (1) *Influence*: “Powerlessness” reflects a lack of influence, characterized by not being heard, not being consulted, and not being involved in the processes of designing regulations and demands.
- (2) *Meaning*: The words “wanting to stop fishing”, “finding it meaningless”, and feeling “discouraged” indicate that the nature of fishing has changed for the fishers and is no longer meaningful to them. Additionally, the mention of “lost pride” reflects a lack of recognition of the importance of fishing as a profession. The fishers also expressed feelings of “shame” and argued that the fishing industry has acquired a “bad reputation” and expressed of sense of “disgrace”.
- (3) *Predictability*: Participants used terms that convey a lack of predictability, including the word “unpredictability”. They mentioned an uncertain future and the difficulties in planning for it, which align with the backdrop of our research, suggesting that frequent changes and new regulations that fishers must comply with to operate their businesses contribute to an unpredictable work environment.
- (4) *Rewards*: With regard to rewards, we primarily heard references to intrinsic rewards, such as a desire to stop fishing, as well as feelings of being less resourceful due to economic hardships and marginalization.
- (5) *Social support*: Social support is defined as social interactions in the form of relationships that provide individuals with either actual assistance or a sense of attachment to a person or group perceived as caring or loving. It influences one’s identity, shaping how individuals view themselves. The participants expressed feelings of nervousness, lack of trust and pride, sense of fear and shame, and an overall negative atmosphere—all of which highlight the absence of social support.
- (6) *Demands*: The only dimension that we did not receive any major comments on was

Table 3. Gold nuggets and psychosocial risk factors*.

Gold Nugget	Definition	Our findings
Gold Nugget 1: Meaning	<i>Meaning in the work: You can see how what you do yourself has a connection with the overall product. It is also the case that work has a meaning beyond making money itself. Values and goals also come into play here.</i>	Discouragement Respondents discussed feeling loss of meaning at work and discouragement. As we unpacked this theme, we see that fishers are losing meaning in their work, where they feel discouraged and lack motivation, some pointed towards lacking spirit to the extent that some respondents pointed towards quitting fishing. Lost pride Loss of recognition was pointed as not feeling pride in their work, or in their existence, feeling marginalised, shamed, and having loss of reputation
Gold Nugget 2: Social support	<i>Social support can be both practical and psychological. The important thing is that it comes at the right time, when you need it. Support can come from both colleagues and managers.</i>	We see lack of social support when the respondents discuss bad atmosphere, distrust and fear in the workplace. Bad Atmosphere Participants pointed towards the negative atmosphere and the bad moods. Distrust Participants also pointed towards distrust. Fear Feeling fear of being criminalised if they made an error, shows the lack of a supportive environment
Gold Nugget 3: Reward	<i>It is important that rewards match the effort put in. If not, they may be seen as unfair. Rewards can come in the form of salary, recognition and appreciation, or opportunities for growth and career advancement. All three types of rewards are essential for employees.</i>	Lack of rewards was highlighted under several themes, for instance, fishers wanting to quit, marginalisation and bad economy , implying fishers being less resourceful was highlighted by some (see bad economy under predictability, and lost pride under discouragement).
Gold Nugget 4: Predictability	<i>Predictability is about getting the relevant information at the right time. The important thing here is to avoid uncertainty and anxiety. So it is not meant to be able to predict the details of everyday life. Predictability is about the big issues.</i>	Unpredictability Participants discussed this explicitly mentioned the issue of unpredictability. Bad Economy The future and difficulty to plan within the fishing practice and industry.
Gold Nugget 5: Influence	<i>The individual has influence on his own work and on the conditions under which it takes place. It can be the working hours, who you work with, the choice of tools or procedures, the organization of the work, the layout of the workplace, etc.</i>	Powerlessness Participants mentioned powerlessness and frustration. Injustice Participants highlighted that there was injustice with the fishing sector.
Gold Nugget 6: Demands	Gold Nugget 6: Demands Definition <i>The demands in the work are both quantitative and qualitative. The quantitative demands must be appropriate. This means that you should neither have too much to do nor too little. The qualitative demands must also suit the person. The work must therefore be neither too difficult nor too easy. Perhaps "a little too difficult" is the best. Finally, the demands must be clear. You must therefore know when the work has been done well enough.</i>	We did not have an overlapping theme here.

Psychosocial risks outcome: **Stress.**

Our findings.

Psychosocial risks can lead to adverse health consequences. This was highlighted in our participants views ⁵where they mention stress and bad health.

*The definitions are based on Kristensen et al. 2013.¹⁸.

demands. Fishers are known to take pride in their profession, and this may explain why they tend to accept work demands in stride.

Evidence suggests that five out of the six dimensions within the gold nuggets framework are connected to psychosocial risk factors that influence well-being in the fishing context. These factors

indicate the psychosocial risks faced by fishers, which are widely recognized for their adverse health consequences and stress-related effects² to the fishers.

Our subsequent workshops focused on the co-creation of recommendations to address the psychosocial risks. Based on an initial literature review and input from the participants in the co-

Table 4. Psychosocial risk factors. Gold nuggets and recommendations.

Psychosocial risk factors	Gold Nuggets	Recommendations (with the respective numbers see details below)
Powerlessness	Influence	1. Strengthen dialogue and collaboration. 5. Adapt policies to different segments
Injustice	Justice	1. Strengthen dialogue and collaboration. 5. Adapt policies to different segments
Discouragement	Meaning	2. Create recognition and trust 4. Pair control with guidance and dialogue
Mistrust Bad economy Fear	Predictability	3. Facilitate planning
Lost pride Stress	Reward Social support	2. Create recognition and trust 6. Promote knowledge exchange

creation workshops, we formulated the recommendations that reflect the voices of the fishers. As part of the co-creation process, an early draft of the recommendations was presented to the participants, who provided feedback and ultimately approved the final set of recommendations. Although the recommendations were neither developed nor designed specifically to align with the gold nuggets framework, several of them closely corresponded with our themes and the gold nuggets. See the overview in Table 4 and the details that follow.

Recommendations

- (1) *Strengthen dialogue and collaboration*: The fishers expressed feeling insufficiently involved in decisions and discussions concerning their industry. Therefore, there is a need to strengthen dialogue and collaboration between fishers and authorities.
- (2) *Create recognition and trust*: Fishers lack recognition, both broadly for their work and for their knowledge of fishing, as well as specifically for their fishing methods. Instead, they feel increasing distrust from authorities and the public. Greater inclusion in the policy process will foster their ownership of fisheries management and ensure that new regulations are implementable.
- (3) *Facilitate planning*: Fishers pointed out that policy initiatives often change within days and can involve significant changes that come as a surprise. This unpredictability affects their work and working environment. Policy changes and intervention announcements should be communicated with prior notice along with an implementation plan and period, as is standard in other industries (such as shipping).
- (4) *Pair control with guidance and dialogue*: While fishers often communicate with Fisheries Management, the audits give them the impression that inspectors are specifically looking for errors that could trigger a fine. This perception may contribute to the fishers' lack of attendance at information meetings, even when the inspectors express a desire for more dialogue. It was recommended that regular meetings be held between fisheries management inspectors and fishers, at times and locations convenient for the fishers.
- (5) *Adapt policies to different segments*: The fishers indicated one-size-fits-all regulations are often contextually irrelevant; for example, some regulations are designed for large international enterprises in the merchant fleet. This creates compliance difficulty and leaves the fishers feeling disadvantaged, as the regulations do not adequately suit their small businesses.
- (6) *Promote knowledge exchange*: Fishers want to share their knowledge about the state of fish stocks with biologists, recognizing that both Danish and international biologists play central roles in Danish fisheries. Biological advice forms the basis for political decisions regarding the size of fishing quotas, so sharing knowledge can be mutually beneficial. However, the knowledge and information provided by the fishers may often be anecdotal, making it difficult to integrate into the

research.¹⁹ A network should be established where fishers can share their knowledge and views on biological issues, allowing biologists to present their results. This collaboration can bridge the gap and facilitate better involvement of fishers in matters that affect their industry.

Discussion

Our study highlights the need for more research on psychosocial risks within the fishing sector, which aligns with King et al's⁴ notion of modern uncertainties. Fishers are often overlooked in industry, policy, and research domains.^{8,20} Commercial fishers, especially small-scale fishers, are important for many communities,²¹ and we note the lack of influence these fishers have in the formulation of regulations can cause stress in their lives and work.

Research on psychosocial risks has significantly increased worldwide over the past two decades²; however, there remains a gap in studies focused on the fishing context.³ Additionally, literature emphasizes the need for better integration and alignment between regulatory regimes controlling the industry and the health and safety of fishers.⁹

This lack of integration and alignment between fishers and policymakers can become a major psychosocial risk for fishers, which must be addressed to implement effective regulations that support thriving fishers.³ Furthermore, the well-being of fishers has been overlooked in literature and policy.^{8,20} Our study contributes to understanding this domain, and our methodology can be replicated by others to better understand the psychosocial risks in the fishing sector.

Conclusion

There is a wealth of research on psychosocial risks, highlighting the adverse consequences on both increased stress and well-being.² However, there is a lack of research within the fishing sector, especially concerning small-scale fishers. This research contributes to filling that gap. We employed action research as our methodology to

explore psychosocial risks and provide policy-makers with actionable recommendations.

We identified key psychosocial risks, aligned these with the gold nuggets framework, and highlighted that a lack of influence and meaning, reduced rewards, and increased unpredictability are likely contributing to heightened stress in an environment that lacks social support. These risk factors underline the vulnerability of fishers, who are neither economically advantaged nor adequately protected.

We acknowledge the limitations of our study, including the number of participants, the limited number of workshops, and its contextual and geographical scope. However, we hope this study may encourage further research focused on psychosocial risks and initiatives to support fishers.

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Ethics approval

The University of Southern Denmark's ethic committee approved the project.

ORCID

Sisse Grøn  <http://orcid.org/0000-0002-7655-8962>

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