HEALTH OFFSHORE

Manual for health promotion for the offshore wind industry

Hamburg

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The manual "HEALTH OFFSHORE" gives specific recommendations for action for health promotion for the rather young German offshore wind industry. The manual builds on a **comprehensive analysis of the working conditions and the health situation of the employees in the offshore wind industry**, which was conducted within the scope of the research project "BestOff" – funded by a grant from the German Federal Ministry of Education and Research. This project was carried out by scientists of the Institute for Occupational and Maritime Medicine (ZfAM), an institution of the University Hospital Hamburg-Eppendorf (UKE) and the Authority for Health and Consumers Protection (BGV) of the Free and Hanseatic City of Hamburg. The analysis is based on different empirical research methods and follows a so-called mixed-method approach:

Literature research in relevant medical and psychological scientific databases on the topic "physical and psychological demands and strains of employees in the German offshore wind industry".

Qualitative telephone interviews with 42 offshore employees and experts (e.g. health, safety, and environment (HSE) managers, occupational safety specialists, company physicians, executives) on their experiences and attitudes regarding the offshore work. The interviews lasted 30 to 60 minutes and were transcribed and content-analysed in detail. The results of the interviews give important insights into the topic and formed the base for the conception of the quantitative online survey.

Quantitative online survey with 384 employees in the offshore wind industry. The online survey was carried out using validated questionnaires and self-developed questions. The data was evaluated by using statistical methods in order to explore the links between various aspects of the offshore work and employees' health.

Presentation of the results and exchange with experts. We presented our results of the literature review and the surveys on numerous events (e.g. at scientific conferences, "round tables" in the offshore wind industry and workshops on offshore occupational medicine). In addition, they were presented to the project advisory board (consisting of representatives of the regulatory authorities, employee representatives, HSE managers, occupational safety specialists and company physicians) and were discussed with experts of the offshore area. The subsequently designed manual was developed in communication with experts of the sector (especially HSE manager)**.**

In the introduction, basic information about health promotion in the offshore wind industry is provided. The following chapters approach six key topics on health promotion:

- Health culture in companies
- Work contents and tasks
- Work organisation
- Working and living environment
- Social relations
- Healthy life offshore

These chapters have a consistent structure: First, **key findings** to each topic are presented. Unless otherwise stated, all results come from our own qualitative and quantitative data collection. Single quotes of interviewees are reproduced in speech bubbles. Then **specific recommendations for preventive action** at the behavioural and structural level are presented. It is important to note that many topics are interlinked and, thus, the content of the chapters may overlap. In order to avoid duplications, we included cross-references for these issues.

We would like to acknowledge the offshore employees for providing us with valuable insights into their working lives as well as the participating experts who enriched our project with their own experiences and expertise. The support and openness of the employees in the industry enabled us to take their needs into account and to develop our manual based on reliable data. The manuals recommendations are aimed especially at those who are responsible for health issues in offshore companies, e.g. HSE managers, medical personnel, company physicians, employees in the human resources department and in the works council. In addition, the manual also gives all other offshore employees valuable tips for a healthy working life in the offshore wind industry.

The goal of making offshore work and offshore workplaces safe and healthy can only be achieved by companies and employees working together.

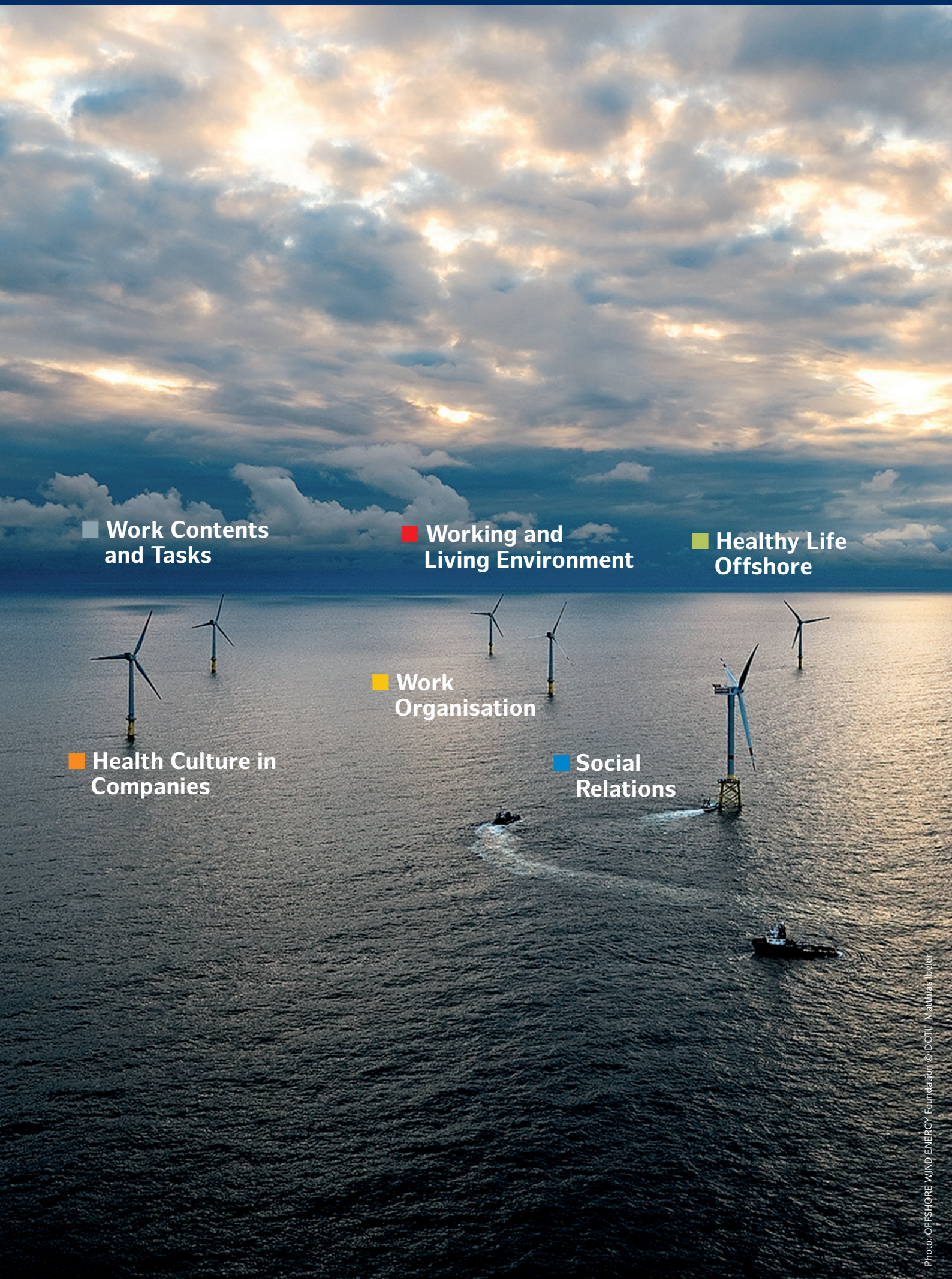


Photo: OFFSHORE WIND ENERGY Foundation © DOTI | Matthijs Ibeler

Characteristics of the offshore workplace

Employees in the offshore wind industry are exposed to hazards and strains that are typical for the work on complex large construction sites and for the running of large electrical installations. Due to the location of the workplace – often far out on the sea, up to 145 km away from the coast – specific hazards and strains come along. Because of the isolation and difficult accessibility of offshore wind installations employees work long periods away from home, frequently in overlengthen shifts, have long transfer times and are mostly accommodated on ships and platforms. There, employees have only limited leisure facilities and a confined social environment. Similar to the maritime sector, the workplace and the accommodation in the offshore wind industry are in close proximity, in some cases there is even spatial overlapping. Therefore, employees are not only exposed to demands and hazards (e.g. noise or vibration) during working shifts, but also during their free time offshore. The intensity of the perceived strains can differ during the construction and operation phase, often it is perceived stronger during the period of construction.

Considering the various demands and hazards in the context of offshore work, workplace health promotion is of great relevance for offshore employees. The primary goal of health promotion is to enable people to gain control over their own health and to improve it by influencing health determinants.[1] The promotion and maintenance of health play an important role in all life situations. The workplace represents an important setting for implementing health promotion in everyday life.[2] Workplace health promotion simultaneously addresses ergonomics, work organisation, the social climate and the individual behaviour of employees aiming at reducing health-related burdens and at strengthening employees' resources.[3]

> The offshore workforce is also essentially a captive audience, living and working in a restricted environment which should be relatively easy to control when implementing health promotion campaigns.[4]

1 Kaba-Schönstein, L. (2018). Gesundheitsförderung: Grundlagen. [Health promotion: Basics]. In: Bundeszentrale für gesundheitliche Aufklärung (BZgA) (Ed.), *Leitbegriffe der Gesundheitsförderung [Keywords of health promotion].* Köln: BZgA.
2 World Health Organisation (1986). Ottawa Charter for Health Promotion] Retrieved from: http://www.euro.who.int/__data/assets/pdf_file/0004/129532/Ottawa_Charter.pdf?ua=1
3 Rosenbrock, R. & Hartung, S. (2018). Gesundheitsförderung und Betrieb [Health promotion and business]. In: Bundeszentrale für gesundheitliche Aufklärung (BZgA) (Ed.), *Leitbegriffe der Gesundheitsförderung [Guiding concepts of health promotion and disease prevention].* Köln: BZgA.
4 Mearns, K. & Fenn, C. (1994). Diet, health and the offshore worker – a pilot study (Offshore Technology Report; No. 399). Aberdeen: Health and Safety Executive, Robert Gordon University.

What is the current state of the art in workplace health promotion in the offshore wind industry?

According to the perception of employees, there are hardly any specific programmes for health promotion in the German offshore wind industry. Even single health promotion activities are only little known to employees and used seldom (Fig. 1). An exception are fitness rooms; these are well known to many employees and used with pleasure.

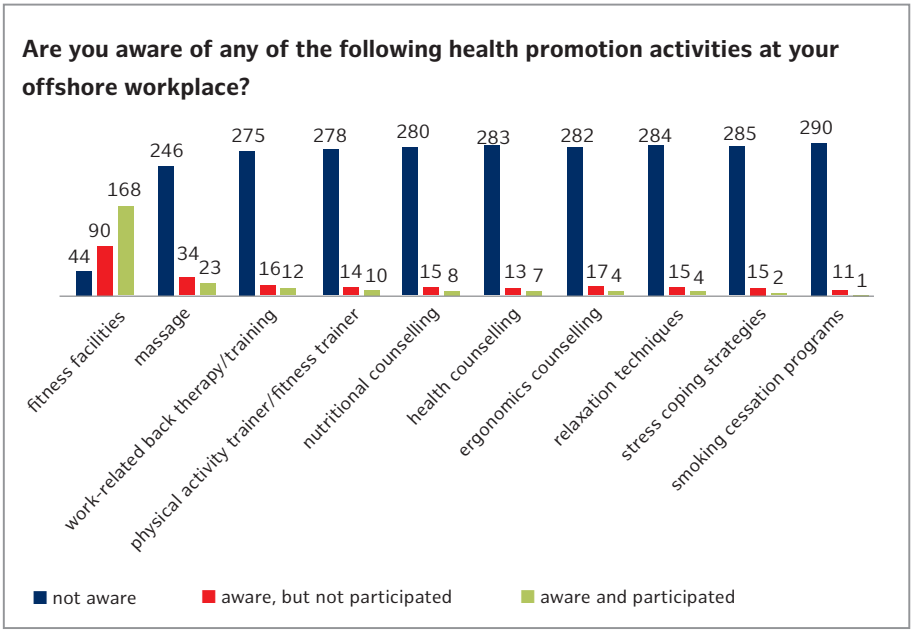


Fig. 1: Offers for offshore health promotion n=303

In general, many employees express a great interest regarding offers to promote their personal health at the offshore workplace. This includes interventions aiming at changing individuals' health behaviour, such as courses and trainings on health topics (Fig. 2). Classical behavioural health promotion are courses on the topics exercise, nutrition, stress or addiction.

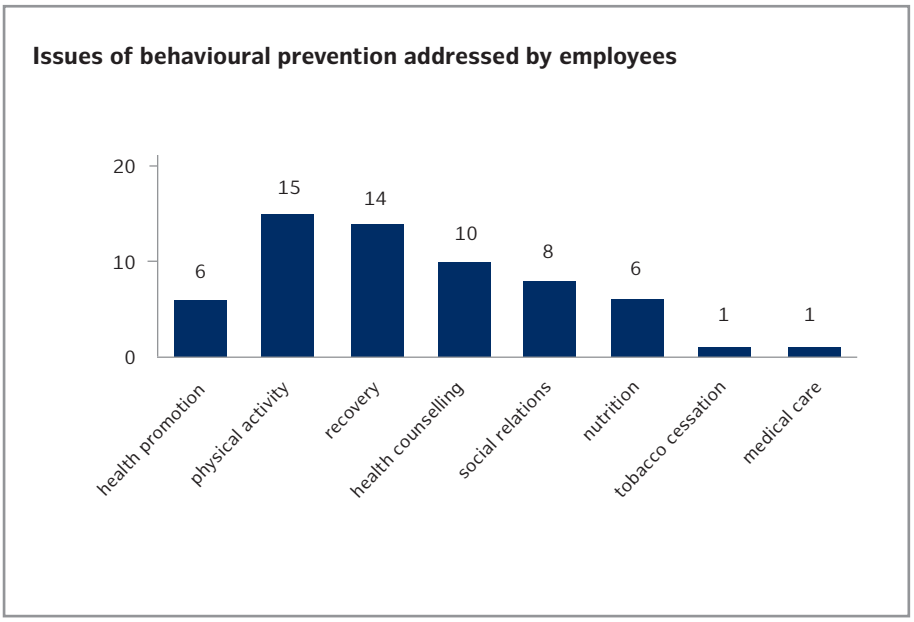


Fig. 2: Issues of behavioural prevention
n=61 (number of mentions, multiple mentions possible)

Behavioural prevention[5,6]

The aim of behavioural prevention is to enhance health literacy and to promote behavioural changes towards individuals' healthy attitudes and choices. This can be achieved through information posters or leaflets, trainings and workshops. For example, in the occupational setting, trainings on healthy lifting or on stress management can be conducted.

5 Franzkowiak, P. (2015). Prävention und Krankheitsprävention [Prevention and prevention of illness]. Retrieved from: https://www.leitbegriffe.bzga.de/alphabetisches-verzeichnis/praevention-und-krankheitspraevention/.
6 Bundesministerium für Gesundheit (BMG) (2015). Prävention [Prevention]. Retrieved from: https://www.bundesgesundheitsministerium.de/service/begriffe-von-a-z/p/praevention/?L=0.

More often employees express wishes concerning interventions which affect the offshore setting and work organisation. These interventions refer to the field of structural prevention (Fig. 3).

Structural prevention[7,8]

Structural prevention influences human health by changing or re-designing the working and living conditions. Specific examples in the occupational setting are an ergonomic design of the workplace, interventions to reduce or avoid noise, vibration, and dust, as well as the supply of healthy food in the cafeteria.

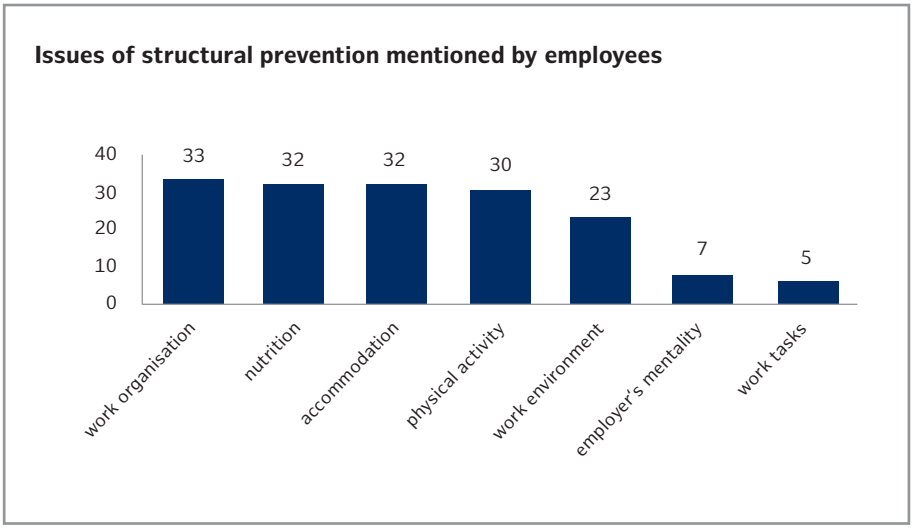


Fig. 3: Issues of structural prevention
n=61 (number of mentions, multiple mentions possible)

7 Franzkowiak, P. (2015). Prävention und Krankheitsprävention [Prevention and disease prevention]. Retrieved from: https://www.leitbegriffe.bzga.de/alphabetisches-verzeichnis/praevention-und-krankheitspraevention/.
8 Bundesministerium für Gesundheit (BMG) (2015). Prävention [Prevention]. Retrieved from: https://www.bundesgesundheitsministerium.de/service/begriffe-von-a-z/p/praevention/?L=0.

Which needs for action can be identified?

The implementation of occupational health and safety regulations and standards is, of course, an essential part of the company's corporate culture. In addition to the generally valid occupational health and safety regulations, the following specific recommendations for offshore workplaces must be considered:

- AWMF Guideline on Aptitude Tests for Offshore Employees (fitness-to-work)[9]
- Recommendations for ensuring first aid in offshore wind farms[10]
- Recommendations for the implementation of the workplace ordinance on offshore platforms[11]
- Recommendations for the use of personal safety equipment[12]

To ensure safe working processes and an effective first aid offshore, risk assessments are especially relevant. According to German regulations (section 5 of the German Occupational Safety and Health Act, section 3 of the German Social Accident Insurance Regulation 1), companies are obligated to conduct risk assessments. Any risk assessment of the offshore workplace has to take into consideration the particularities of this work environment (i.e. its remoteness and the potentially adverse weather conditions) when addressing the issue of evacuation in emergency cases. Since 2013, companies are also legally obligated to address psychological strains within the scope of workplace risk assessments and to implement appropriate actions to improve the working conditions (section 5 (3) no. 6 of the German Occupational Safety and Health Act).
Beyond the legal obligations concerning workplace safety and health protection, offshore employers should offer programmes on workplace health promotion for their employees. Health promotion in the occupational setting can make an essential contribution to improving and preserving employees' health. Today, the offshore wind industry already has a great demand for qualified employees. Therefore, it is of paramount importance for companies to invest in the health of their staff in order to preserve their knowledge, experiences and quality of work as long as possible.

In the context of a holistic workplace health promotion, measures of behavioural and structural prevention should be related to each other and reasonably coordinated. The results of our research show the great interest and manifold needs of offshore employees for health promotion offers. These needs were taken into account when deriving the recommendations for this manual.

9 Decker, U., Faesecke, K. P., Kremer, A. J., Preisser, A. M. & Rogall, U. (2015). S1-Leitlinie 002/43: Arbeitsmedizinische Eignungsuntersuchungen für Arbeitnehmer auf Offshore-Windenergieanlagen und Offshore-Installationen [S1 Guideline 002/43: Occupational medical aptitude tests for employees on offshore wind energy plants and offshore installations]. Retrieved from: https://www.awmf.org/uploads/tx_szleitlinien/002-043l_S1_Arbeitsmedizinische_Eignungsuntersuchung_Offshore_2015-02.pdf.
10 Deutsche Gesetzliche Unfallversicherung e. V. (2016). FBEH „Erste Hilfe in Offshore-Windparks" ["First Aid in Offshore Wind Farms"] (12/2016). Retrieved from: https://www.dguv.de/medien/fb-erstehilfe/de/documents/info_offshore.pdf.
11 Deutsche Gesetzliche Unfallversicherung e. V. (2019). FBHM-098 „Offshore-Plattformen - Empfehlungen zur Umsetzung der Arbeitsstättenverordnung" ["Offshore Platforms – Recommendations for Implementing the Workplace Ordinance"] (02/2019). Retrieved from: https://publikationen.dguv.de/dguv/udt_dguv_main.aspx?FDOCUID=27094.
12 Deutsche Gesetzliche Unfallversicherung e. V. (2014). FBPSA „PSA im Offshore-Bereich" ["PPE in the Offshore Area"] (02/2014). Retrieved from: https://www.dguv.de/medien/fb-psa/de/publikationen/fachinfo-offshore.pdf.

What should be considered when designing health promotion offers?

In principle, employers should be willing to allocate enough personal and financial resources to protect and strengthen employees' health. Therefore, a company agreement can be very helpful to set the goals, the form and scope of health promoting activities as well as the responsibilities beyond the legal obligations regarding workplace safety and health protection. Recommendations for designing health-related company agreements have been issued.[13] In this regard, it is crucial to involve the various levels of the company.[14] On the micro level, employees and their individual health situation are addressed. On the meso level, the focus lays on the company itself: standards, values and attitudes towards workplace health promotion in the company should be reviewed. At the company level, participatory development of the guiding principles can promote a cooperative and appreciative collaboration in which the health of employees is given high priority.[15] At the macro level, social and political developments as well as legal framework conditions which may have an influence on activities of workplace health promotion must be considered. Health promotion should always be designed and implemented in a participative manner, i.e. with employees' collaboration.[16] So called health and quality circles are an effective way of promoting employees' participation. Here, small groups of employees (including the company medical staff, specialists for occupational safety and the workers' council) can uncover and discuss specific health and safety issues and suggest interventions and policies. The moderation of these rounds should be carried out by trained professionals to enhance their effectiveness.

In addition, companies can also receive support from external actors in the field of health promotion. For example in Germany, the accident insurance system and the statutory health insurance provide financial and planning support to companies for workplace health promotion within the framework of the prevention legislation.[17] The aim is to reduce work-related health hazards and accidents.

In the long term, workplace health promotion should be anchored in companies' corporate structure as an important part of comprehensive workplace health management in addition to occupational health and safety and return to work management. This requires the active participation of the executive management, the workers council, employees from the human resources department, HSE managers, company physicians, and offshore medical staff.

13 Giesert, M. & Geißler, H. (2003). Betriebliche Gesundheitsförderung. Analyse und Handlungsempfehlungen [Workplace health promotion. Analysis and recommendations for action]. Retrieved from: https://www.boeckler.de/pdf/mbf_bvd_betriebliche_gesundheitsfoerderung.pdf.

14 Smith, A. P., Allen, P. H. & Wadsworth, E. J. K. (2006) Seafarer fatigue: the Cardiff research programme. Retrieved from: http://orca.cf.ac.uk/48167/1/research_report_464.pdf.

15 Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA) (2016). Psychische Gesundheit in der Arbeitswelt – Soziale Beziehungen [Mental health in the world of work - Social relations]. Retrieved from: https://www.baua.de/DE/Angebote/Publikationen/Berichte/F2353-2b.pdf?__blob=publicationFile&v=5.

16 World Health Organisation (1986). Ottawa Charter for health promotion. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0004/129532/Ottawa_Charter.pdf?ua=1

17 GKV-Spitzenverband (2018). Leitfaden Prävention – Handlungsfelder und Kriterien nach §20 Abs. 2 SGB V [Guide to prevention - fields of action and criteria according to section 20 (2) of Book V of the German Social Code]. Retrieved from: https://www.gkv-spitzenverband.de/media/dokumente/presse/publikationen/ Leitfaden_Pravention_2018_barrierefrei.pdf.

How can the specific target group be addressed?

A fundamental difficulty is that workplace health promotion interventions often only reach the already healthy employees, but not the "risk groups". In order to strengthen the participation of employees who are less interested in health, it is important to address specific target groups. Health promotion programmes should be tailored to the particular group of offshore employees, which consists almost exclusively of men who are relatively young and generally in good health. Health promotion targeting these employees should focus on strengthening available resources and avoid a deficit-orientated perspective. For example, when offering interventions to increase physical activity, the emphasis should be put on improving and strengthening employees' physical performance. Various aspects of the offshore setting may potentially favour participation in health promotion programmes and activities, such as the social support provided by team colleagues, the lack of alternatives and the limited leisure facilities on platforms and ships.

When designing health promotion programmes, the particular work schedule of offshore employees must also be taken into account. Due to the challenging work tasks and long working hours, employees are often exhausted after work, which can make it more difficult for them to participate in health promotion offers. For this reason, the integration of health promotion activities into working hours and waiting times should be considered. Besides, offers should be created which can be used continuously – offshore and onshore. This ensures continuous care and counteracts the problem of employees perceiving two different areas of life in which they behave differently regarding their health. This can be achieved, for example, by using digital solutions (health apps and -platforms), which can be used independent of time and place. Such offers are regarded as innovative and are attractive especially for younger employees in a technology-intensive industry. Apps allow to combine various health topics, such as physical activity, nutrition, and stress management, and to document successes and changes in behaviour.

However, digital health promotion programmes do not replace personalised care for offshore employees – therefore, they should not be offered exclusively. Equally important are, on the one hand, attendance courses to impart knowledge and promote motivation and, on the other hand, individual health coaching by qualified specialists (e.g. health manager). This kind of coaching can help raise employees' awareness of their health and health risks. In addition, trainers and employees together can develop individual action plans, which has a particularly motivating effect.

What are the barriers to implementation and use?

There are several barriers to implementation of health promotion programmes in the occupational setting. For example, companies often have only limited financial and personnel resources. Moreover, the personnel might be not qualified enough for such specialised tasks. In addition, more urgent problems often have to be solved and the focus is on day-to-day business, while health promotion is of secondary importance. In some companies, the awareness for the necessity of workplace health promotion is still rather low. However, a positive trend is that many companies are showing great interest in our research results – health and well-being seems to be moving increasingly into the focus of offshore companies.

In the long term, it is desirable that networking structures are established in the offshore wind industry, promoting exchange of knowledge and experiences. A "health promotion work group", for example, in which those responsible for health from various offshore companies regularly exchange information (both personal and, if necessary, via an internet platform) and thus benefit from each other's experiences in workplace health promotion could be established.

HEALTH CULTURE IN COMPANIES

Photo: OFFSHORE WIND ENERGY Foundation © Adwen | Jan Oelker

General health culture

The well-being of offshore employees plays a key role in keeping them healthy and safe in the long term. Many employees would like to see employers showing more interest for their needs and a health promoting corporate culture being established and lived in the company. A corporate culture that harmonises with the needs and values of the employees also has key advantages for employers: employees feel more committed with their company, have more motivation, deliver a higher quality of work and show a better general state of health. [18]

More attention to the employee and his needs.

Recommendations for action

Behavioural

- Awareness of the relevance of health and health promotion should be raised in offshore companies, amongst other things, by highlighting the negative consequences of sick leave to the companies (e.g. loss of productivity, financial losses).
- Employees and executives should be trained on health issues to strengthen their own health competences (e.g. through lectures, workshops).
- Company physicians can also use their know-how to promote the health culture in companies.

Structural

- The development of a health promoting corporate culture needs a genuine and long-term commitment from the people responsible in the company.[19]
- Employees should be actively involved in all processes regarding the design of health-promoting working conditions. They should get the chance to express their own suggestions and ideas with regard to health-promoting work design (e.g. in regular surveys or by setting up an anonymous "mailbox" for the wishes of employees).
- Compliance with the recommendations of the AWMF Guideline on Aptitude Tests for Offshore Employees[20] is an important part of the corporate health culture.

18 Badura, B. & Ehresmann, C. (2017). Unternehmenskultur, Mitarbeiterbindung und Gesundheit [Corporate culture, employee retention and health]. In: Fehlzeiten-Report 2016 [Absences report 2016] (p. 81-94). Berlin, Heidelberg: Springer.
19 Mearns, K. & Hope, L. (2005). Health and well-being in the offshore environment: The management of personal health (Research report; No. 305). Sudbury: Health and Safety Executive.
20 Decker, U., Faesecke, K. P., Kremer, A. J., Preisser, A. M. & Rogall, U. (2015). S1-Leitlinie 002/43: Arbeitsmedizinische Eignungsuntersuchungen für Arbeitnehmer auf Offshore-Windenergieanlagen und OffshoreInstallationen [S1 Guideline 002/43: Occupational medical aptitude tests for employees on offshore wind energy plants and offshore installations]. Retrieved from: https://www.awmf.org/uploads/tx_szleitlinien/002-043l_S1_Arbeitsmedizinische_Eignungsuntersuchung_Offshore_2015-02.pdf.

The role of the medical staff offshore

The medical staff offshore, colloquially known as "offshore medics", includes various types of medically trained professions, e.g. paramedics and emergency paramedics. In coordination with the company managers and company physicians, the medical staff offshore is responsible for central tasks in preventive health promotion. Offshore employees often mention the medical staff as important local contacts for health issues. Medical staff give lectures on health-related topics and advise employees on health problems. Therefore, they can act as health multipliers on the platforms and could contribute their experience and knowledge in designing interventions (although this is not yet common practice). Workplace health promotion programmes developed with the participation of medical staff on the platforms and service ships are particularly well received by offshore workers.[21] Studies from the offshore oil and gas sector show that these personnel can address health issues better and more effectively if they receive support from the offshore company, e.g. through training, resources provided and exemption from other secondary health-related activities.[22]

Recommendations for action

Behavioural

- The medical staff should be specifically trained in workplace health promotion so that this group of employees can act as a health-multiplier on the platforms.
- The medical staff should use the regular emergency exercises to train the offshore first-aiders and refresh their knowledge. This strengthens first aiders' self-confidence and improves the internal rescue coordination.

Structural

- Financial and time resources as well as support of the executive management must be guaranteed in order to provide sufficient time for the medical staff to carry out tasks in the context of workplace health promotion.[23]
- The organisation of first aid in offshore installations (emergency call, rescue-chain, tele-communication, coordination with first aiders and external helpers on site) requires the cooperation and coordination of company physicians and medical staff. The recommendations of the German Social Accident Insurance on organising first aid must be taken into account here.[24]

21 Mearns, K. & Hope, L. (2005). Health and well-being in the offshore environment: The management of personal health (Research report; No. 305). Sudbury: Health and Safety Executive.
22 Mearns, K. & Hope, L. (2005). Health and well-being in the offshore environment: The management of personal health (Research report; No. 305). Sudbury: Health and Safety Executive.
23 Mearns, K. & Hope, L. (2005). Health and well-being in the offshore environment: The management of personal health (Research report; No. 305). Sudbury: Health and Safety Executive.
24 Deutsche Gesetzliche Unfallversicherung e. V. (2016). FBEH „Erste Hilfe in Offshore-Windparks" ["First aid in offshore wind farms"] (12/2016). Retrieved from: https://www.dguv.de/medien/fb-erstehilfe/de/documents/info_offshore.pdf.

Presenteeism

Presenteeism

Presenteeism (from presence = attendance) describes the employees' behaviour to go to work despite illness. If employees ignore their illness symptoms – e.g. a cold – and still go to work, they are more likely not to cure their illness and even become more seriously ill. They can also infect other employees.

Presenteeism also matters in the offshore sector. Offshore employees should report whether they feel able to work or not before any deployment and just before any upcoming offshore transfer. During offshore deployments, employees must declare that they are unable to work in case of illness at the latest **before** the start of the shift in order to not endanger themselves and others. At the beginning of a new shift, team meetings are held to clarify whether all employees feel healthy – absences must be reported. Although this procedure is well known, it happens that several offshore employees want to work despite illness and do not report being unable to work (Fig. 4).

Failure out there is unfavorable. And it happens quite often that you "torture yourself back" to your workplace.

Have you ever felt ill during an offshore assignment but not reported to the medic in order to avoid a medical referral?

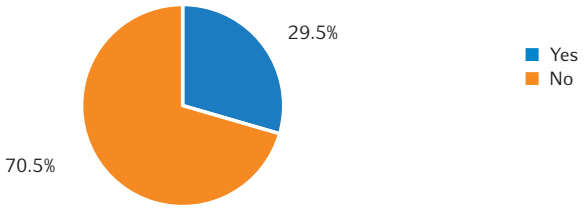


Fig. 4: Not reported illnesses n=244

This is particularly critical, since sick offshore employees might be threatened with acute health risks if their condition gets worse. In addition, if evacuations are necessary, external rescue personnel must be called in, which entails additional risks and costs. This behaviour can be favoured if the payment, additional danger pay and bonuses of employees are linked to their actual working hours. In order to avoid sickness-leave, some offshore employees only visit the medical staff only as a really last option. Almost a third of the employees surveyed – no matter whether technical, management or service personnel – state that they have already omitted to inform the medical staff in the case of illness in order to not being absent from work.

Recommendations for action

Behavioural

- The health competence of each individual employee should be strengthened, e.g. by emphasising personal responsibility and sensitising them to their own body image in order to better assess warning signals from the body. "Risk persons" should be identified and specifically sensitised to their behaviour and its potential effects.[25] The "fitness-to-work" examination provides a suitable framework for this.
- The staff should be sensitised to the fact that employees take care of each other and appeal to colleagues with symptoms of illness to report that they are unable to work.
- Executives have a great influence on their employees through their role model function.[26] They should set a good example and not work in the case of illness. They should signal to their employees that any symptoms of illness should be taken seriously and that employees who cannot work should not fear any negative consequences.
- The medical staff on the platforms should be made aware of the problem of presenteeism and employees should be made aware of the risks associated with it.[27]
- In principle, strengthening the resilience of employees can contribute to maintaining their health and health awareness and thus reduce the appearance of presenteeism. Within the framework of resilience training, employees and executives can be made aware of their individual resources and these can be promoted. In resilience trainings, protective factors can be pointed out and exercises, discussions as well as self-reflexions can be carried out.

Resilience[28]

Resilience (Latin resilire = to jump back) includes the individual's psychological resilience and thus the ability to cope with difficult circumstances in life without negative consequences. The strengths, abilities and capacities of an individual are at the centre. Resilience is influenced by various factors such as optimism, acceptance, problem-solving attitudes, relationship building, responsibility and self-regulation.

25 Kramer, I., Oster, S. & Fiedler, M. (2013). Iga.Fakten 6. Präsentismus: Verlust von Gesundheit und Produktivität [Iga.Facts 6. Preseneetism: Loss of health and productivity]. Retrieved from: https://www.iga-info.de/fileadmin/redakteur/Veroeffentlichungen/iga_Fakten/Dokumente/Publikationen/iga-Fakten_6_Praesentismus_2.pdf.
26 Kramer, I., Oster, S. & Fiedler, M. (2013). Iga.Fakten 6. Präsentismus: Verlust von Gesundheit und Produktivität [Iga.Facts 6. Presenteeism: Loss of health and productivity]. Retrieved from: https://www.iga-info.de/fileadmin/redakteur/Veroeffentlichungen/iga_Fakten/Dokumente/Publikationen/iga-Fakten_6_Praesentismus_2.pdf
27 Mearns, K., Hope, L. & Reader, T. W. (2006) Health and well-being in the offshore environment: the role of the organisational support. (Research report; No. 376). London: Health and Safety Executive.
28 Gruhl, M. & Körbächer, H. (2012). Mit Resilienz leichter durch den Alltag. Das Trainingsbuch [With resilience easier through everyday life. The training book]. Freiburg: Herder Verlag GmbH.

Structural

- In order to reduce the occurrence of presenteeism, it makes sense to structure the employment contracts of employees in a way that payment or bonuses are not linked to the hours worked (i.e. sickness-leave is not penalized).[29]
- In principle, employers should provide their employees with all the necessary personnel and time resources to perform their work tasks during their working hours. This can reduce employees' fears that sickness-leave will have a negative impact on their workload.[30]

KEY MESSAGES

- The establishment of a **health culture in the company** is the central task of corporate management. This requires long-term commitment and the provision of human and financial resources.
- Employees and executives should be involved in all processes of **workplace health promotion**.
- The health culture on the platforms and ships in the offshore wind industry can be promoted in particular by **medical staff** as local health multipliers.
- **Presenteeism** (going to work despite illness) also occurs in offshore settings. To counteract this, the health competence and risk perception of employees and executives should be improved through training and instruction.

29 Kramer, I., Oster, S. & Fiedler, M. (2013). Iga.Fakten 6. Präsentismus: Verlust von Gesundheit und Produktivität [Iga.Facts 6. Presenteeism: Loss of health and productivity]. Retrieved from: https://www.iga-info.de/fileadmin/redakteur/Veroeffentlichungen/iga_Fakten/Dokumente/Publikationen/iga-Fakten_6_Praesentismus_2.pdf.

30 Kramer, I., Oster, S. & Fiedler, M. (2013). Iga.Fakten 6. Präsentismus: Verlust von Gesundheit und Produktivität [Iga.Facts 6. Presenteeism: Loss of health and productivity]. Retrieved from: https://www.iga-info.de/fileadmin/redakteur/Veroeffentlichungen/iga_Fakten/Dokumente/Publikationen/iga-Fakten_6_Praesentismus_2.pdf.

WORK CONTENTS AND TASKS

Photo: OFFSHORE WIND ENERGY Foundation © Jan Oelker

Physical work and ergonomic aspects

Various activities at offshore workplaces are physically demanding for the employees and require a high degree of physical fitness. In addition, some tasks imply non-ergonomic postures and movements, thus posing considerable demands on the musculoskeletal system. The most common ergonomic stress factors in offshore work from the employees' point of view are: "Climbing" (63.8%), "Transport of tools and aids (PPE[31] etc.)" (47.4%), and "Lifting/carrying heavy loads" (41.9%) (Fig. 5).[32]

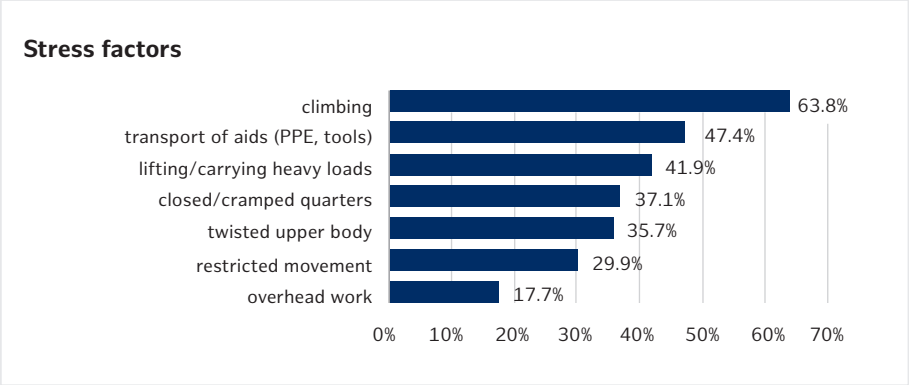


Fig. 5: Demands related to physical work and ergonomic aspects
n=between 252 and 255

It is not uncommon to carry out overhead work and work with the upper body turned or bent forward. Especially those personnel who carry out manual work on the wind turbines are affected by these demands – regardless of whether they are working in the construction or operation phase.

Generally, the work is physically very taxing. There is also climbing included, and also to move material and larger components...

Furthermore, working in cramped spaces can be physically and mentally stressful for employees. Confined space makes it difficult to do work ergonomically. The limited space often forces employees to work in unfavourable postures, e.g. when lifting or carrying heavy loads. However, the majority of employees (87.3%) is "satisfied" or even "very satisfied" with the general physical working conditions.

Some offshore employees mainly work at offices on platforms or ships (e.g. project managers or site managers with screen work). Standing workstations are also represented in offshore wind farms (e.g. in the workshop area and in the kitchen). Working in sitting and standing positions can also be demanding, when the setting leads to non-ergonomic postures, one-sided musculoskeletal strains or it limits the freedom of movement.[33] Therefore, ergonomic aspects have to be considered as well when furnishing and designing workplaces (cf. → The ergonomic workplace, p. 29).

31 PPE = personal protective equipment
32 The percentages shown refer to the persons who have indicated that these demands occur "often" or "always".
33 Berufsgenossenschaft Holz und Metall (BGHM) (2018). Sitz- und Steharbeitsplätze. Abgerufen von: https://www.bghm.de/arbeitsschuetzer/fachinformationen/ergonomie-und-arbeitsplatzgestaltung/sitz-und-steharbeitsplaetze/.

Recommendations for action

Behavioural

- The physical strain can be reduced through specific trainings in ergonomics, which consider the special features of the workplace and the different settings and work situations (e.g. on deck, on the tower, cramped spaces).
- Lifting and carrying heavy objects manually should be reduced as much as possible. The behaviour of employees and the use of aids should be adapted accordingly.[34,35]
- In principle, all employees who handle heavy loads manually during their work should be trained in the correct lifting and carrying (cf. → Correct lifting and carrying of loads, p. 27).
- Employees should also be given instructions on compensatory physical exercises to counteract the effects of one-sided loading of the musculoskeletal system during work (cf. → Physical activity, p. 70).

The correct lifting and carrying of loads[36]

- Tighten the abdominal muscles before lifting.
- Squat down and lift the load with your back straight and close to your body.
- Hold the weight as close as possible to the body and carry it.
- Pay attention to a straight back and do not fall into the hollow back.
- Always turn the entire body, otherwise the spine will be heavily strained.
- No sudden movements, only slow flowing movements.
- When placing the load, make sure that the load is placed on a raised surface and not directly on the floor.
- When putting the load down on the floor, kneel again and tense the abdominal muscles.

34 Pennie, D., Malcolm, D. & Sides, R. (2018). Guidelines on reducing manual handling and ergonomics related incidents in the offshore wind industry. London: Energy Institute.
35 Energy Institute (2018). Good practice guideline – Working at height in the offshore wind industry. Retrieved from: https://publishing.energyinst.org/__data/assets/file/0007/555253/Pages-from-G-Work-at-Height-Guidelines-2nd-Edition-B31jk-HARD-VERSION.pdf.
36 Berufsgenossenschaft Handel und Warenlogistik (BGHW) (2019). Heben und Tragen [Lifting and carrying]. Retrieved from: https://www.bghw.de/arbeitsschuetzer/praevention-von-a-z/f-l/heben-und-tragen.

Structural

- Work equipment should be made available to employees to assist them in lifting and carrying heavy objects, e.g. carrying aids on the platforms.
- Employees should have access to trainings in ergonomics.
- Modern workplace equipment (including office workplaces) including good light sources – the best is daylight – creates a good working atmosphere.
- Height-adjustable workstations make it possible to change working postures more frequently. They should be standards if they can be integrated into the workflow.
- By involving the employees in the allocation of tasks, they can choose tasks that suit their individual performance and current ability to work under pressure. Here, for example, it can be communicated which employees have already performed physically demanding tasks on the previous day, so that the work tasks can be distributed evenly.[37]

37 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

The ergonomic workplace[according to 38,39]

- The **sitting workstation** should be designed in such a way that an upright posture of the upper body is possible.
- A movable, height-adjustable work chair with individually adjustable armrests should be provided.
- A seat angle of 90° between the upper body and the thighs is recommended. Upper and lower arms should form a right angle while the forearms lie relaxed on the table.
- The back should be in contact with the backrest so that the supporting function can be used.
- Both feet should always have floor contact.
- The work surface should be as height-adjustable as possible, so that it can be adapted to the height of the respective user (e.g. electrically height-adjustable desks) and the change from sitting to standing working posture is made possible.
- Dynamic sitting promotes back health. Therefore, the sitting posture should be changed frequently.
- Screens should be positioned in such way that the view is slightly downwards, at a distance of approximately 80 cm.
- The **standing workstation** should allow an upright posture with upper arms falling vertically downwards. A right angle between upper and lower arm and a total head and eye inclination of 30-35° is recommended.
- Standing seats can support long periods of standing.
- It should be possible to switch between standing and seated positions if the workflow permits it.
- Chairs at the workbenches should be height-adjustable, without armrests, with a swinging backrest.
- The ideal time distribution for stationary workplaces is 60% sitting, 30% standing and 10% walking.

38 Berufsgenossenschaft Holz und Metall (BGHM) (2015). Bildschirm- und Büroarbeitsplätze: Leitfaden für die Gestaltung [Monitor and office workstations: Guide on design]. DGUV-Information 215-410. Retrieved from: https://www.bghm.de/fileadmin/user_upload/Arbeitsschuetzer/Gesetze_Vorschriften/Informationen/215_410.pdf.

39 Verwaltungs-Berufsgenossenschaft (VBG) (2016). Gesund arbeiten am PC [Healthy working on the computer]. VBG-Info. Retrieved from: http://www.vbg.de/SharedDocs/Medien-Center/DE/Broschuere/Themen/Bildschirm_und_Bueroarbeit/Gesund_arbeiten_am_PC_Faltblatt.pdf?__blob=publicationFile&v=26.

Transfer and access to offshore wind turbines

The transfer from the living accommodations (on the platforms, ships or offshore islands) to the offshore wind turbines takes place by ship or helicopter. Adverse weather conditions during the transfer to the turbines rise the risk of seasickness. Almost 30% of employees have already suffered from seasickness during an offshore assignment, and among them, three-quarters have suffered from seasickness during the transfer to the installations via ship. In addition, seasickness can also occur at offshore workplaces (19.5%) and during leisure time in offshore accommodations (13%).

Accessing the offshore wind turbines is physically demanding for many employees. It can also be mentally challenging, e.g. because of adverse weather conditions, particularly high waves. Adverse weather contributes to an increased risk of accidents – the knowledge of this fact can already increase employees' perceived stress. Especially employees with less offshore experience tend to report a higher stress experience and a greater tension when stepping over.

When they get pressure directly the first time and should step over in borderline weather, so, of course you don't like to say "No", because you don't want to stand there as a failure. I can imagine that there is a certain psychological strain and pressure.

The vast majority of employees (92.4%) is "satisfied" or "very satisfied" with the system to access the turbines. Reasons for dissatisfaction are, for example, lack of space on the transfer systems, insufficient training to prepare for the transfer or poor communication between the actors involved in the transfer. Finally, the employees also have to rely on the competence and cooperation of the boat captain and other colleagues when climbing over.

Recommendations for action

Behavioural

- The safety standards should require the wearing of a life jacket with crotch strap and integrated AIS emergency transmitter for sea rescue ("crew finder"). These life jackets offer additional safety when climbing over, as the person can be easily located in the case of a fall into the water.
- Greater awareness of the dangers of climbing over should be raised among all employees. Individual concerns expressed by employees should be respected and taken seriously.
- Promoting knowledge and trust between the actors involved in the transfer from vessels to the installations can facilitate the transfer.
- It is important to sensitise for each other's awareness during transfer and transition in order to avoid possible accidents: e.g. care should be taken that all colleagues wear their safety equipment correctly. Especially employees with seasickness should be supported.
- When ascending and descending ladders, it is common practice for the person securing the transfer to announce the last five steps loud for orientation. This procedure should always be executed.
- In the training sessions onshore, a stronger focus should be placed on accessing the installations and on simulating different scenarios (high waves, strong wind, etc.), if possible, with different transfer systems. The safety of the employees also has the highest priority within the framework of exercise scenarios.

Remedies against seasickness[40,41]

- The stomach should not be too full or too empty during the transfer. Before departure and on longer journeys it is advisable to eat something in between (e.g. fruit).
- No fatty or sweet food should be eaten before and during the trip, instead foods rich in carbohydrates (e.g. bread) should be eaten.
- Coffee or juices containing acid should not be drunk before and during the journey as these drinks can irritate the stomach.
- Chewing a ginger root can alleviate feelings of nausea.
- By fixing the horizon or lying on your back with your head raised and your eyes closed, your body can better balance the swaying of the ship.
- The avoidance of histamine-containing foods (salami, tuna) is helpful because histamines can promote nausea and vomiting.
- Using drugs against seasickness can lead to fatigue and thus limit the ability to drive and work after ingestion. This represents a safety risk. Therefore, the use of drugs (including over-the-counter preparations) may only take place after consultation with the responsible physician and with simultaneous sick leave.

40 Max-Planck-Institut für Dynamik und Selbstorganisation (2011). Warum werden wir Seekrank? [Why do we get seesick?]. Retrieved from: https://www.ds.mpg.de/76273/49.
41 Deutsche Apotheker Zeitung (2006). Reisekrankheit – wenn die Fahrt zum Übel wird [Travelsickness – when the trip becomes a misery]. Retrieved from: https://www.deutsche-apotheker-zeitung.de/daz-az/2006/daz-23-2006/uid-16009.

Structural

- Preference should be given to the use of transfer systems that are less prone to accidents. Technical solutions should be used to minimise the risk of accidents when crossing from the transport ship to the platform and vice versa; e.g. a walk-to-work system ("Ampelmann-System") enables a safe access, as this system can compensate vessel movements (motion compensation).[42]
- If the weather conditions limit the possibility of approaching the installations, it is advisable to define maximum waiting times so that employees do not have to wait too long on the vessels.
- During their assignments, employees should be accommodated, if possible, on residential platforms standing firmly on the seabed or on land in order to reduce the incidence of seasickness.

Working materials and equipment

Missing or inoperable work equipment at offshore workplaces (e.g. non-functioning lifts) may pose difficulties on the work. They may represent an additional physical burden, because missing or malfunctioning aids and tools have to be compensated with physical work of the employees. Wearing personal protective equipment (PPE) can also hinder moving work equipment or doing certain tasks, especially in confined spaces. Only a few employees (8.2%) are generally dissatisfied or very dissatisfied with their safety/protective equipment. Reasons for dissatisfaction may be that the equipment is incomplete or inconsistent or that ordering processes for new work equipment take too long.

Recommendations for action

Behavioural

- Employees must be well instructed on the health and safety risks at work and their obligation to wear personal protective equipment (PPE).
- Advice and training on work equipment should be compulsory. These can be integrated into regular instructions and tool box talks, for example, and should include the following topics:
  - correct use of PPE,
  - prevention of health risks by using protective equipment (e.g. reduction of work-related skin problems),
  - correct handling of equipment that could cause illnesses due to vibration.

42 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

Structural

- Employees should be equipped with individually adapted protective equipment so that they can still move as freely as possible. Possible conflicts between safety requirements and ergonomics at the workplace must be considered in risk assessments.
- Damaged or defective protective equipment and tools must be immediately labelled as damaged and withdrawn from use. Then they must be repaired or replaced immediately.
- All necessary work equipment should be available completely and uniformly and be transferable to different locations. Lists of materials for work tasks can simplify work processes and ensure that all necessary work equipment is available.

KEY MESSAGES

- Various offshore activities are **physically demanding and ergonomically stressful** for employees. In order to cope well with physically demanding work – e.g. lifting and carrying heavy loads – instruction and ergonomics training are just as necessary as aids, which must be always available.
- The **transfer and access** to offshore installations can be physically and mentally stressful. Mutual mindfulness, risk awareness, clear communication rules and exercise units in advance can support a safe transfer.
- **Missing or non-operational work tools/equipment** (e.g. non-functioning lifts) can complicate offshore work and cause safety risks. Employees must be fully instructed on health and safety risks. Necessary work and safety equipment (e.g. individual protective equipment) must always be available and ready to use.

WORK ORGANISATION

Photo: OFFSHORE WIND ENERGY Foundation © Areva Multibrid | Jan Oelker

Work schedule

Employees with a so-called 14/14 work schedule perform their work tasks for 14 days in the offshore wind parks and then spend 14 days off onshore. The 14-day work period is perceived by many employees as very long. At the beginning of the assignment, the employees look forward to their work, are motivated and can work concentrated. However, over time, the exhaustion caused by the long working days can grow and the motivation and performance of the employees can decrease.

The first week, everyone is still happy that he can work again. But within the second week, you can always hear the men already saying: "Oh yes, now only for so many days and then it goes back home".

Many employees (64.1%) feel especially exhausted at some point during their offshore operations. Approximately one third of those surveyed feels particularly exhausted both mentally and physically (Fig. 6).

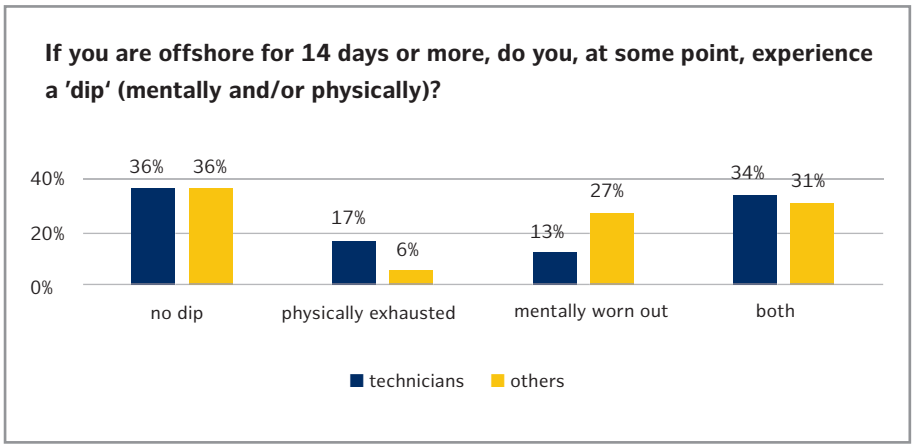


Fig. 6: Physical and mental exhaustion

n=223

Technical personnel report physical exhaustion almost three times more frequently than other occupational groups (e.g. offshore management, medical staff). In contrast, the other occupational groups experience particularly severe mental exhaustion twice as often. Many employees experience a particularly strong feeling of exhaustion (so-called "dip") on a day between the 6th and 13th day of work. Most employees (25%) experience such a "dip" on the 10th day of work (Fig. 7).

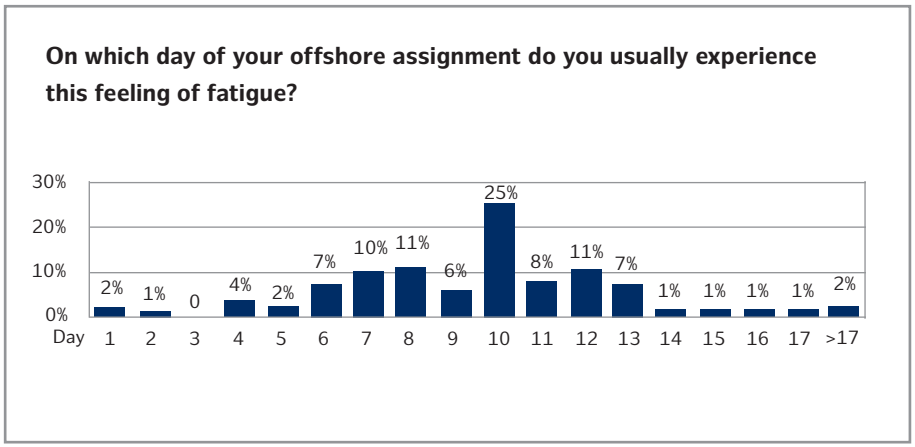


Fig. 7: Day with a particularly strong feeling of exhaustion n=142

There are many little things that are just positive. My son is now 7 months old. When we go to baby swimming lessons I am the only dad there, because all of the other dads are at work.

At the same time, the 14/14 work schedule is also assessed positively by many employees. For example, the regularity of the deployments makes it very easy for employees to spend a lot of free time onshore with family and friends.

Recommendations for action

Behavioural

- Employees should be made sensitive to the experience of exhaustion: if they feel exhausted (e.g. after particularly strenuous work), they should have the opportunity to take specific short breaks from work in order to recover.

Structural

- The executives should also be aware of the employees' perceived strong experience of exhaustion in the middle of the second working week, so that they can adjust the work requirements for the employees.
- Peaks of stress should be determined by activity analysis so that additional support (e.g. additional staff) can be used for particularly stressful and strenuous working hours or tasks.
- The offshore deployment plan should be predictable. Reliable, continuous resource planning allows employees to better plan their private lives.[43] In the interviews, individual employees wished to reduce the length of deployment from 14 days to 12 or 10 days.
- Our findings show that employees with regular work schedules make more frequent use of health-promoting services offshore, such as fitness rooms, than employees with irregular work schedules. Clearly structured deployment schedules increase the opportunities for all employees to take advantage of health-promoting offers both offshore and during onshore phases.

43 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

- It can also be helpful to establish contracts with external providers, so that employees can take advantage of discounted sports offers, for example, during onshore phases. In addition, in order to not interfere with employees' free time for recovery, no additional preparation, follow-up or refresher courses should be prescribed during the 14 days off onshore.

Working time

Working time arrangements in the offshore wind industry are very different from those for employees onshore. Offshore employees work 14 consecutive days in 12-hour shifts. There are no weekends or days off at sea.

Offshore Working Time Ordinance (Offshore-ArbZV)

Since 2013, the German Ordinance on Working Time for Offshore Activities (Offshore-ArbZV) has regulated the exceptions from the Working Time Act for employments of employees with offshore activities. It applies to the coastal sea, the German exclusive economic zone (EEZ) and ships on which offshore activities are carried out. It provides, among others, for the following:

- A maximum working time of 12 hours per day with a maximum stay of 14 days in a row.
- A daily maximum average working time of 10 hours with a maximum stay of 21 days in a row.
- At least 60 minutes of rest if the working time is more than ten hours.

The 12-hour shifts are perceived as long and tiring by many employees. Due to additional work preparation, post-processing and documentation tasks, it is not always possible for employees to complete all work tasks within the 12 hours. Overtime is particularly common among employees with management tasks and a high level of responsibility. More than half of the employees show a strong need for recovery at the end of a working day (Fig. 8). The general need for recovery among offshore employees is higher than among employees in other sectors (Fig. 9).

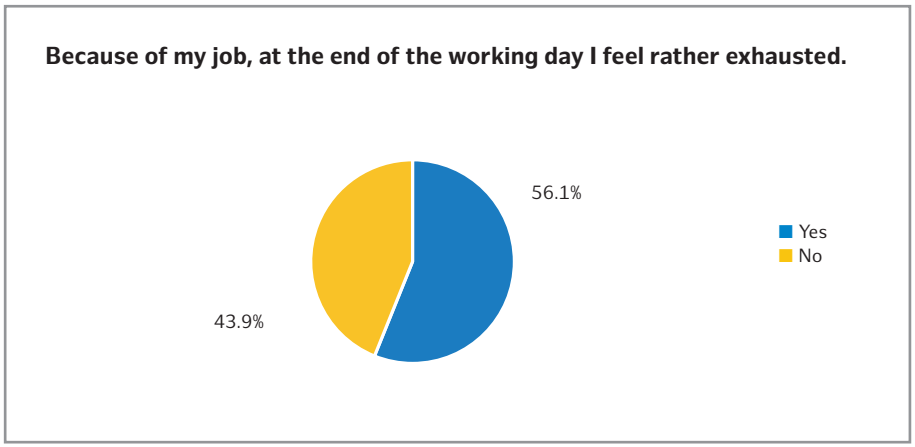


Fig. 8: Fatigue at the end of a working day n=244

There are days when I'm 36 hours up. There are colleagues who work up to 40, over 40 hours.

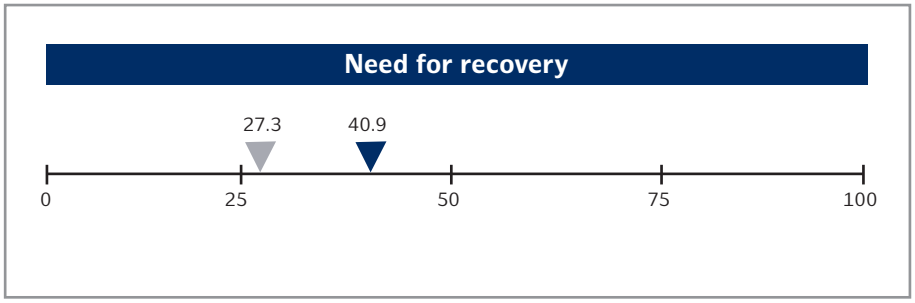


Fig. 9: Need for recovery of offshore employees in comparison to other occupational groups

Mean value of the sample of offshore employees (n=250, blue arrow) for the "need for recovery" scale. In comparison: mean value of a sample of other employees (men and women of different age and occupational groups (n=68775, grey arrow[44]).

What are the consequences of fatigue?[45]

There is an association between the experience of fatigue and the occurrence of accidents at work. For example, workers with a high level of fatigue faced more than twice the risk of an accident at work compared to workers with a low level of fatigue.

44 Van Veldhoven, M. J. P. M. & Broersen, S. (2003). Measurement quality and validity of the "Need for recovery" scale. Occupational and Environmental Medicine, 60 (Suppl 1), i3-i9.

45 Swaen, G. M. H., Van Amelsvoort, L. G. P. M., Bültmann, U. & Kant, I. J. (2003). Fatigue as a risk factor for being injured in an occupational accident: results from the Maastricht Cohort Study. Occupational and Environmental Medicine, 60 (suppl 1), i88-i92.

Recommendations for action

Behavioural

- During breaks, the work area (at least office workplaces) should be left as far as possible so that the breaks can be spent undisturbed.
- Employees should make active use of their breaks and non-working hours, e.g. by taking short walks on the deck or in the accommodation area.
- Health apps (e.g. for back health or pedometers) can also be used for active breaks. The use of relaxation techniques can also be helpful for quick and effective relaxation at the workplace.
- The recovery phases in the free shifts should be as undisturbed as possible for the employees (cf. → Sleep hygiene, p. 76).

Active breaks

Stretching and strengthening exercises are particularly suitable for active breaks. These can be performed while sitting (e.g. on the office chair) or standing, for example:

- knee bends
- lunges
- swing arms and let them circle
- shoulder and neck stretching exercises

The Institute for Work and Health (IAG) of the German Social Accident Insurance has published a booklet about working and breaks: http://www.dguv.de/medien/iag/praxisfelder/dokumente/arbeiten-pause-broschuere.pdf

Relaxed breaks

Through various relaxation methods, the body can regenerate, and the mind can settle down.

- **Breathing exercises:** Find a relaxed position. Consciously inhale through the nose and exhale through the mouth. The hands can be placed on the abdomen and the lifting and lowering of the abdominal wall can be perceived.
- **Eye exercises:** Move your eyes up, down, left and right several times or circle your eyes in both directions.
- **Progressive muscle relaxation:** Active tensing and relaxing of different parts of the body; e.g. pulling up the shoulders, holding them for a moment and releasing them again or clenching the hands to fists, holding them briefly and opening them again.

Structural

- Clear regulations on breaks for all employees should be implemented and observed. In order to ensure enough time for rests, employees should not have any tasks assigned to them beyond their shifts.
- Fitness points or relaxation islands could be implemented, to be used by employees during their breaks for movement and relaxation.
- The scope of the work tasks should be reduced or distributed among more employees so that no overtime is required.
- In the interviews, some employees expressed the wish of a decrease in working hours from 12 to 10 hours, more reliable working times and more free time for non-work-related activities offshore.

Culture of taking breaks[46]

- **Company:** The culture of taking breaks is relevant for the working atmosphere and the performance of the employees. Task planning should be designed in order to enable employees to take a break without time pressure.
- **Executives:** They set an example and should always take their breaks and motivate employees to take their breaks.
- **Team:** General acceptance for reliable times for taking breaks should be created in the team. Minor problems and wishes regarding the design of breaks should be discussed directly in the team.
- **Employees:** Key elements of a successful break (e.g. leaving the workplace, relaxation exercises if necessary) should be familiar to the employees or should be imparted to them.

46 Paridon, H. & Lazar, N. (2017). IgaReport 34. Regeneration, Erholung, Pausengestaltung – alte Rezepte für moderne Arbeitswelten? [Iga.Report 34. Regeneration, recreation, design of breaks - old recipes for modern working environments?] Initiative Gesundheit und Arbeit (Ed.). Retrieved from: https://www.iga-info.de/fileadmin/redakteur/Veroeffentlichungen/iga_Reporte/Dokumente/iga-Report_34_Regeneration_Erholung_Pausengestaltung.pdf.

Shift work

Offshore wind turbines are in continuous use; also, while constructing the wind farms it is necessary to have work done day and night. Shift work models are widespread in the offshore industry, with some employees working only day shifts during their assignments and others working alternately either only day shifts or only night shifts. Shift work and especially night shifts can be stressful. Particularly at the beginning of their assignments, employees have to adjust themselves to the changed rhythm – sleep problems can result.

Recommendations for action

Behavioural

- Various sleep hygiene tips to improve individual sleep can be helpful, especially for employees working night shifts (cf. → Sleep hygiene, p. 76). These practical tips can be given offshore to employees, for example in the form of instruction or training.

Structural

- In order to avoid accidents due to lack of concentration, dangerous and physically demanding activities should only be done by employees during the day shift.[47]
- The number of consecutive night shifts should be as low as possible. After a night shift period, a rest period as long as possible should follow.[48]
- The night shift should end as early as possible. The early shift should not start too early. This can reduce the accumulation of a sleep deficit.
- In the case of heavy, stressful work, the shift duration should be adjusted additionally.
- During the night shift the first break (approx. 30 minutes) should take place between 0 and 1 o'clock and a second break (approx. 15 minutes) between 4 and 5 o'clock.[49]
- The statutory minimum rest periods of 11 hours within 24 hours according to section 5 of the German Working Time Act (ArbZG) must be observed (exception: section 9 (2) of the German Offshore Working Time Ordinance (Offshore-ArbZV): On days on which the employees are transported from the land to the place of deployment, the daily rest period may be shortened by the duration of the transport time, but by no more than two hours, differing from section 5 (1) of the German Working Time Act (ArbZG)).

47 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

48 Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA) (2019). Gestaltung von Nacht- und Schichtarbeit [Designing night and shift work]. Retrieved from: https://www.baua.de/DE/Themen/Arbeitsgestaltung-im-Betrieb/Arbeitszeit/Nacht-und-Schichtarbeit.html.

49 Verwaltungs-Berufsgenossenschaft (VBG) (2013). Gesundheitsgefahren bei der Schichtarbeit. VBG-Fachwissen [Health hazards during shift work. VBG expertise]. Retrieved from: http://www.vbg.de/SharedDocs/Medien-Center/DE/Broschuere/Branchen/Glas_und_Keramik/Schichtarbeit_Gesundheitsgefahren_Glas_Keramik_Fachinformationsblatt.pdf?__blob=publicationFile&v=8.

Time pressure

Offshore employees may experience time pressure in various work situations, such as sudden weather changes or emergencies. Time pressure at work can also be related to the project stage of the wind farm: time pressure can increase especially during construction when certain time slots must be met – after all, all work must be completed by the employees on time and within stable weather periods. Time pressure is related to the high costs associated with major projects in the offshore industry. Time pressure at work can increase performance and motivation in the short term, but if it is experienced permanently, it can lead to stress and health problems.

You just don't have the time you have on land, because of course everything is a bit more expensive and a bit more important.

Recommendations for action

Behavioural

- Time management seminars can help to improve the work organisation of employees, which, in turn, can reduce time pressure at work.
- Employees should always be allowed to decide for themselves whether an activity in a particular situation is too risky for them and whether the work should therefore be postponed.
- Executives and the management should underline that safe work methods have priority, even if this may cause delays in the project.[50]
- After-action reviews with employees (e.g. meetings after an emergency) allow to reflect on both positive and negative experiences regarding time pressure and to derive improvement actions.

Structural

- In order to reduce time pressure, working time and task planning should be realistic and the work to be done should be feasible for the employees.[51]
- For tasks without strict time windows or deadlines, task packages could be created. The teams can then work through these packages consecutively. If it is not possible to complete all tasks, these can be finished in the next shift.[52]
- Clear time schedules, such as when the workstation is to be tidied up before the end of the shift (e.g. half an hour before the end of the shift), can create time reserves so that workstations can always be left safely.[53]

50 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

51 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

52 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

53 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

Waiting times and weather days

Offshore work is strongly determined by the prevailing weather. On days with adverse weather conditions, there may be waiting times and changes in working procedures for offshore employees. On so-called "weather days", the conditions are so bad that it is impossible to work at all. This can lead to dissatisfaction and discontent among employees. If it is not possible to work for several days, the feeling of a "cabin fever" can arise.

"Weather days" and long waiting times are more often perceived as a stress factor by employees during the construction of wind farms than during the operational stage. However, limited periods of low workload can also be perceived positively, since employees have this additional recovery time.

They want to work, not just hang around. It is almost unbearable! After a week stuck on a ship, you start to feel like a rat in a cage.

Recommendations for action

Behavioural

- Waiting times or "weather days" can be used actively by employees, e.g. to complete emergency, safety and first aid trainings and to participate in health promotion programmes.
- Health apps could also be used by employees. These include, for example, fitness exercises that can be done with everyday objects and in limited spaces.

Structural

- It is advisable to communicate waiting times as early as possible: as soon as it becomes obvious that waiting times will occur, employees should be informed.
- Decision-making criteria regarding access to the installations (e.g. maximum wave heights), should be applied in a standardised manner as far as possible so that they are comprehensible to all employees.
- There should be enough places of retreat where employees can spend waiting time.
- In addition, enough opportunities should be provided for training and for employees to pass the time during short and long waiting periods: e.g. specific training, language courses (offshore-specific English language courses are also useful to improve technical communication) or physical activity.

Work processes

Well-structured and coordinated work processes are perceived positively by many offshore employees. In contrast, delays in work processes and short-term changes in work planning are perceived as a burden.

Another big problem offshore is this inconsistency. Especially when we have such smaller operations or measuring to do, it is set somewhere: "Then and then it should start". Then there are delays in it, then it starts tomorrow... "Oh no, not tomorrow, the day after tomorrow".

Employees do not always feel informed early enough about changes regarding their workplace and work tasks (Fig. 10). In addition, some employees report that they do not always get all the information they need to do their job appropriately.

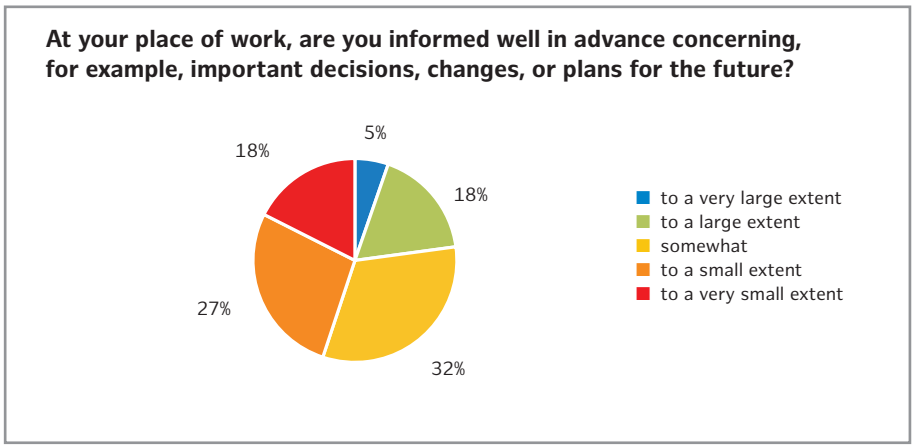


Fig. 10: Flow of information n=245

In general, offshore employees rate the predictability of their work slightly lower than employees in other occupations (Fig. 11).

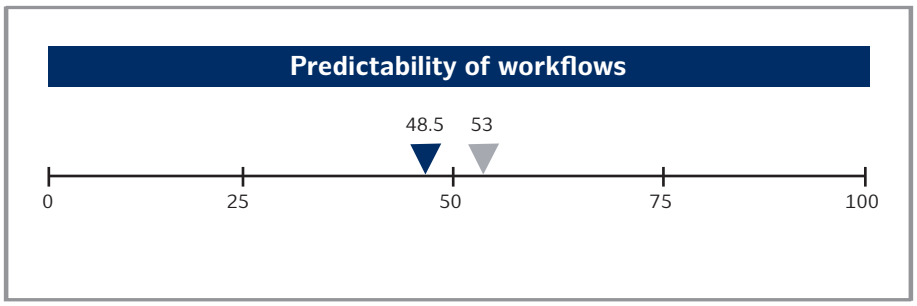


Fig. 11: Predictability of workflows for offshore employees and other occupational groups

Mean value of the sample of offshore employees (M=48.5, n=250, blue arrow) for the COPSOQ "Predictability" scale. In comparison: mean value from sample of other male employees in Germany (M=53, n=4546, grey arrow[54]).

54 Nübling, M., Vomstein, M., Nübling, T., Stößel, U., Hasselhorn, H. M. & Hofmann, F. (2011). Erfassung psychischer Belastungen anhand eines erprobten Fragebogens – Aufbau der COPSOQ-Datenbank [Surveying psychological strains with a validated questionnaire – Setting up the COPSOQ data base]. Retrieved from: https://www.copsoq-datenbank.de/xls/copsoqdb_standardtabellen_250811.xls.

Recommendations for action

Behavioural

- Work can be done faster and better in a team that works well together. Therefore, employees should be given access to team training and team-building activities.

Structural

- Work tasks and work processes should be universally applicable and standardised and should be written down in SOPs.
- As experts at their workplace, employees should analyse their own work processes and interfaces, give feedback and identify possibilities for improvement. In this context, it is a good idea for employees to write down their work processes and then discuss them (e.g. in team meetings).
- Material lists should be created and included in maintenance plans. This ensures smooth and simplified work processes and greater predictability.[55]
- In the long term, task planning could be based on an annual rhythm, taking into account potential seasonal deviations: for example, more outdoor work could be done in the summer months. In winter, more education, trainings and indoor work could be carried out due to the shorter working hours caused by bad weather conditions.

55 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

Good connection with an open ear on the other side.

Communication offshore/onshore

Most employees (59.6%) are "satisfied" or "very satisfied" with the communication between their colleagues in the offshore wind farms and those in the back office onshore. Good cooperation between employees on- and offshore requires the exchange of exact information, which is made more difficult by poor internet and telephone connections. On weekends, the options for communication are limited because the back office onshore is not always manned. Some offshore employees would like to have more administrative support and improved work planning onshore in order to reduce the workload offshore. Some employees perceive a lack of understanding between employees onshore and offshore, which may be related to the fact that onshore employees without any experiences offshore have a different impression of the working conditions offshore

Sometimes worlds separate us. For colleagues onshore, some things are not comprehensible. A lot of things that are taken for granted onshore and that nobody thinks about are important issues here.

Recommendations for action

Behavioural

- Employees onshore should get more familiar with offshore work, e.g. through reports from their colleagues offshore on their day-to-day work or through video recordings from the offshore environment. It should also be examined whether employees onshore could visit the offshore workplace in order to enhance their knowledge, although this generates additional costs.
- Information can be shared through a variety of communication channels such as email, phone calls, video conferencing or face-to-face. The channel of communication should be chosen according to the particular task:
  - Text-based communication channels, e.g. e-mails, are suitable for brainstorming.
  - Auditory and audio-visual media, such as telephone calls and video conferences, are suitable for problem-solving and decision-making tasks.
  - In negotiation tasks, different opinions must be coordinated, which is why face-to-face communication is more suitable.
  - In text-based and auditory communication, greater care must be taken to ensure that feelings, such as doubts, are expressed clearly.[56]
- Regarding the flow of information within the company, attention must be paid to these points:
  - The company's project coordinators, for example, pass on information to employees via the executives. This information should be as detailed as possible so that employees can carry out the work based on it correctly. The other way around, when information is given from the bottom up to the project coordinators, it should only contain the most important results (bundled if possible).
  - Regular team meetings should be held to improve the flow of information. These should always be recorded in a written manner. That way employees can refer to decisions and agreements at any time.

56 Boos, M. (2017). Wie virtuelle Zusammenarbeit gestaltet und verbessert werden kann [How virtual collaboration can be designed and improved]. Personal Quarterly, 69(2), 6-9. Retrieved from: https://zeitschriften.haufe.de/ePaper/personal-quarterly/2017/987D26D3/files/assets/basic-html/page11.html.

Structural

- The campaign planning and work preparation onshore should be very precise and thorough - this will take the pressure off the employees offshore.
- Stable internet and telephone connections are necessary to ensure continuous communication between employees onshore and offshore.
- Efficient communication structures are also necessary for the use of teleconsultation in emergencies, for first aid actions and for coordination with the emergency control centre.
- Communication should be based on jointly defined standards and terminologies to make sure everyone involved understands the same thing.
- If employees do not know each other onshore and offshore, this can make trustful communication difficult. Therefore, it is important to encourage colleagues to get to know each other better within the company.
- In addition, conflict-solving structures can be set up to enable employees to provide anonymous feedback, e.g. via online tools. A general complaints management system is also helpful.
- A so-called "Critical Incident Reporting System" for anonymous reporting of critical events can also help to promote communication regarding emergencies and reduce the risk of accidents or near-accidents.

Staffing

Staffing is an important factor for the productivity of companies in the offshore wind industry and for the health of employees. In the perception of the employees, sometimes not enough personnel is available in order to cope with the amount of work offshore. Therefore, employees want employers to hire more and better qualified personnel for offshore work.

Recommendations for action

Behavioural

- Existing collective agreements should be extended. Precarious forms of employment, such as temporary work as well as contracts for services should be reduced, since they are often experienced as mentally stressful. The companies' works councils should always be involved in personnel matters.[57] However, uniform payment systems are difficult to implement because of the large number of international staff working on the projects and the existence of different collective wage systems in the different countries.

57 Lenz, J., Ludwig, T. & Timm, S. (2017). Branchenanalyse Windenergieindustrie. Arbeitsbedingungen und Marktentwicklung aus Sicht von Betriebsräten [Industry analysis wind energy industry. Working conditions and market development from the view of the workers council]. Hans Böckler Stiftung (Ed.). Retrieved from: https://www.boeckler.de/pdf/p_fofoe_WP_035_2017.pdf.

- For safety reasons, at least two people have to be planned offshore for each task, and it is not permitted to work alone.[58] In addition, staff planning should be realistic and take into account absences and changing work requirements. This could also counteract presenteeism (cf. → Presenteeism p. 22).
- Executives should be skilled in planning staff and tasks. Those who are responsible for planning time, task and staff should already have their own offshore experience.[59]
- Decisions about staff should be presented transparently.
- Personnel management should include actions for staff development (e.g. training and further education, age-appropriate career development) and staff retention (e.g. creation of intangible incentive systems).
- In order to meet the demand for qualified offshore staff, training activities and the recruitment of skilled employees should be promoted in enterprises, e.g. through training quotas and applications for public funding.[60]

Training activities in the German offshore wind industry

Due to the strong growth of this industry, there is an increasing need for qualified specialists. Companies are therefore called upon to participate actively in the training of new professionals.

58 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

59 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

60 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

KEY MESSAGES

- The **14/14 work schedule** can cause severe fatigue, loss of motivation and performance among employees during deployment. Workers should be able to take work breaks on their own if they experience fatigue.
- The daily **working time** (12-hour shifts, often additional work preparation and follow-up) is perceived as long and tiring. Clear break regulations for all employees, a design of active breaks as well as undisturbed recovery periods are elementary for daily regeneration.
- **Shift work** can be associated with sleep problems. In addition to tips on individual sleep hygiene, the occupational medicine recommendations for the design of night and shift work must also be taken into account.
- **Time pressure** at work can lead to stress in the short term and health problems in the long term. In order to reduce time pressure, realistic planning of working hours and tasks is essential. In addition, time management seminars can support employees.
- On days with adverse weather conditions, **waiting times** and changes in work processes can happen. Predictable waiting times should be communicated as early as possible. They can be actively used, e.g. for emergency and first aid training or health promotion.
- **Delays and short-term changes in the workflow** can be reduced through good teamwork. In regular team meetings, employees should jointly question their work processes and interfaces, uncover opportunities for improvement and develop own solutions.
- **Communication** between employees onshore and offshore is often hampered by poor internet and telephone connections and a lack of mutual understanding of the respective work tasks. Stable communication channels and a common language (defined standards and terminologies) can facilitate a precise exchange of information.
- **Too few and insufficiently qualified staff** is a burden on employees. Collective agreements should be extended and precarious forms of employment (e.g. temporary work) reduced. Realistic staff planning also takes account of absences from work and changing work requirements.

WORKING AND LIVING ENVIRONMENT

Photo: OFFSHORE WIND ENERGY Foundation © Detlef Gehring

Changing weather conditions

Offshore work is often affected by extreme weather conditions (heat in summer, strong wind in winter, rain, cold and lack of daylight). The change between cold and heat at the workplace is often not only unpleasant but can also be physically demanding. Wearing survival suits is also a physical strain, especially when the outside temperatures are high. During certain activities, offshore employees are exposed to strong sunlight, which is intensified by the reflective water surface. On some days it is not possible to work at all because of extremely adverse weather conditions (cf. → Waiting times and weather days, p. 43). These days can have a negative effect on employees' job satisfaction.

Recommendations for action

Behavioural

The demands on the organism caused by changing weather conditions can be reduced by simple behavioural methods:

- Apply adequate sun protection with a high protection factor to exposed skin areas; this is particularly important when working outdoor or staying on deck for long periods (e.g. during transfer to the installations).
- Wear headgear (e.g. a hat if no helmet is required) and sunglasses on days with intense sunlight.
- Drink enough, either water or mineral water.

Structural

- Adequate sun protection and enough drinks should be provided by the employer.
- Different protective clothing must be available for different weather conditions: Insulating, warming, rainproof and releasing/reflecting heat.

Space conditions

In general, many offshore employees perceive the available spaces on ships and platforms as cramped regarding sleeping quarters, recreation and leisure areas. The lack of freedom of movement as well as restrictions to personal retreat needs, combined with inadequate equipment in the rooms, are a burden for many employees. Especially relevant for employees are the restrictions on their privacy.

Recommendations for action

Structural

- To increase employees' well-being during their assignments, it is important that all rooms are well-kept and that their equipment is regularly checked for functionality and condition.

Noise

Noise is very common in the offshore environment. Noise can occur during certain work activities, e.g. in connection with the use of tools. In such situations, the legal threshold for the use of personal protective devices against possible noise-induced hearing loss is commonly reached.

Noise threshold values

The threshold specified in the German Noise and Vibration Occupational Health and Safety Ordinance are limiting values which should not be exceeded during work. In specific terms, the average acoustic noise measured at the workplace should not exceed 80 or 85 decibels. If this threshold is achieved, there is a legal obligation to take actions to avoid and reduce noise. In addition, according to the German Ordinance on Occupational Health Care (ArbMedVV), it is necessary to offer regular medical examinations for workers exposed to such levels of noise.

Background noise, e.g. caused by the use of ventilation systems and ship machinery, door slamming, or work done by third parties also represents a burden for offshore employees. Due to shift work, it is not unusual that noisy activities are carried out at times when some of the employees have their rest periods. All this leads to a continuous noise level in work, recreation and sleeping areas.

What are the consequences of noise for offshore employees?

Background noise affects the whole organism and causes stress and sleep disturbances – the so-called extra-aural effects – which appear even at low noise levels (i.e. without exceeding the above mentioned thresholds).[61] Noise is considered by offshore employees to be one of the main causes of sleep problems (Fig. 12).

It's definitely a lighter sleep, if not just generally worse. You realize this when you're home and it feels like you've got cotton wool in your ears; everything is suddenly so quiet.

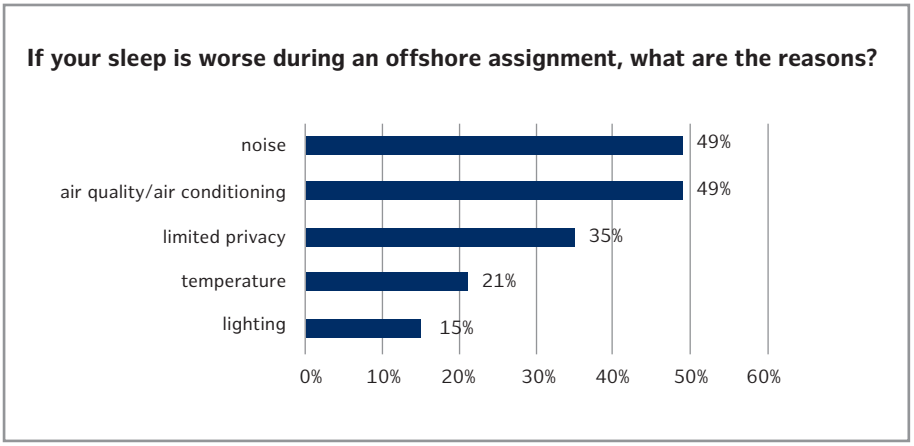


Fig. 12: Reasons for worse sleep offshore (multiple mentions possible) n=268

Recommendations for action

Behavioural

- Employees must be instructed in how to wear personal hearing protection. An individually adapted hearing protection (so-called ear mould) with filters that allow voice communication is ideal.
- All employees should be informed about "background noise", its negative effects and ways of avoiding background noise. Suitable tools for this are preparatory trainings onshore and local instructions.
- Employees must be encouraged to respect rest and sleeping areas and to avoid noise in these areas.

61 Giering, K. (2010) Lärmwirkungen: Dosis-Wirkungsrelationen. [Noise: Dose-response relationship.]. Umweltbundesamt. Retrieved from: https://www.umweltbundesamt.de/sites/default/files/medien/461/publikationen/3917_0.pdf.

Mandatory sign “Please be quiet!”
© BRADY GmBH, SETON Division, Egelsbach

Structural

- Special attention should be paid to technical interventions for noise reduction in the sleeping and rest areas when planning new plants.
- Rest areas should be clearly marked as such.
- In places where employees sleep, mandatory signs (e.g. “Please be quiet!”/”Sleeping area”) should be placed to remind other employees to be quiet.
- Employees should be accommodated in soundproof single cabins. If possible, the cabins should not be located directly next to noisy workplaces.
- The labelling of noise areas in which the threshold values are exceeded is mandatory by law and must be implemented in practice. Employees may only stay in these areas if this is necessary for the work process and if they wear suitable personal protective equipment.

According to section 4 of the German Occupational Health and Safety Act, dangers should always be addressed directly at the place of origin. If this is not possible, organisational and personal precautions should be taken. The so-called “TOP”-principle is valid here.

T = technical	• encapsulation of a noise source • use of work equipment that causes no or less noise.
O = organisational	• restriction of working time in case of high noise exposure • noise breaks • spatial separation of work with high noise exposure • labelling of noise areas
P = personal	• providing hearing protection by the employer and ensuring that employees wear hearing protection when the upper trigger values are reached or exceeded. • wearing hearing protection

Air quality and indoor climate

Especially in closed rooms, air quality and indoor climate essentially contribute to the general well-being and performance of the employees. Smells that are perceived as unpleasant are often the cause of complaints at various workplaces.[62] Offshore employees report poor air quality and unpleasant smells as causes of sleep disturbances. The perception of indoor climate not only depends on objective factors, such as temperature and humidity, but also on the physical and psychological stress of people.[63]

Recommendations for action

Behavioural

- For living and recreation areas, the most important thing is to create a pleasant indoor climate. In the plants themselves – tower, nacelle and transformer stations – the realisation/guarantee of a constant pleasant temperature and humidity is usually not possible.
- In general, workplaces should have a room temperature of 22 °C ± 2 °C and a relative humidity of 45% ± 15%, as these are considered to be comfortable.[64]
- The working rooms, recreation rooms and cabins should have modern air conditioning/ventilation systems that work effectively and quietly. Ideally, there should be the possibility of natural ventilation.

62 Sucker, K. & Neumann, H.-D. (2013). Geruch und Geruchsinn [Smell and olfaction]. In: Deutsche Gesetzliche Unfallversicherung (DGUV) e. V. (Ed.), Innenraumarbeitsplätze – Vorgehensempfehlung für die Ermittlungen zum Arbeitsumfeld [Indoor workplaces – Recommendations for the investigation of the working environment]. Retrieved from: https://publikationen.dguv.de/dguv/pdf/10002/rep_ira.pdf.

63 Felten, C., Neumann. H. D. & von der Heyden, T. (2013). Raumklima [Indoor climate]. In: Deutsche Gesetzliche Unfallversicherung e. V. (DGUV) (Ed.). Innenraumarbeitsplätze – Vorgehensempfehlung für die Ermittlungen zum Arbeitsumfeld [Indoor workplaces – Recommendations for the investigation of the working environment]. Retrieved from: https://publikationen.dguv.de/dguv/pdf/10002/rep_ira.pdf.

64 Deutsche Gesetzliche Unfallversicherung e. V. (DGUV) (2016). Beurteilung des Raumklimas. Handlungshilfe für kleine und mittlere Unternehmen [Indoor climate assessment. Guideline for small and medium-sized enterprises]. DGUV-Information 215-510. Retrieved from: https://publikationen.dguv.de/dguv/pdf/10002/215-510.pdf.

Relaxation and leisure areas

Relaxation and leisure areas play an important role in the social interaction of the workforce. For this reason, enough space should be offered.

Examples of group activities[65]

Even if not all employees participate, it is worthwhile to organise group activities offshore in cooperation with the employees. These can be:

- sport/fitness competitions (e.g. counting steps with the fitness tracker)
- computer/video game, collaborative and competitive
- quiz evenings
- movie nights
- evenings of party games (e.g. table football or billiard)
- learning together: e.g. professional skills training

Ideally, relaxation and leisure areas provide leisure equipment, such as televisions, board games, video game consoles, etc., so that employees can do group activities during their time off. Care should also be taken to ensure that the equipment is well kept and functioning so that it can be used.

Recommendations for action

Behavioural

- Employees should use the available relaxation and leisure areas regularly.
- Employees are responsible for the careful handling of the equipment and for reporting any need for repair or maintenance.

Structural

- Enough space should be provided for relaxation and leisure activities.
- The relaxation and leisure areas should be protected as far as possible from noise and vibration and should be air-conditioned.
- Attention should be paid to attractive design and adequate, functional equipment.

65 International Seafarers' Welfare and Assistance Network (ISWAN) (2018). Psychological Wellbeing at Sea: A Good Mental Health Guide for Seafarers. Retrieved from: https://www.seafarerswelfare.org/assets/documents/ship/Psychological-Wellbeing-at-Sea-English.pdf.

KEY MESSAGES

- Offshore work is often influenced by **extreme weather conditions**. Adequate protective equipment includes insulating, warming, rain-proof as well as heat-emitting clothing and sun protection.
- **Limited space** is associated with restrictions to privacy, movement and retreat. The use of relaxation and leisure areas by employees, including fitness rooms, is promoted by an attractive design and functioning equipment.
- **Noise exposure** during work and time off is very common in the offshore environment. A reduction of background noise, which disturbs the relaxation periods, can be achieved by structural improvements. It is very important that rest areas are clearly marked and respected.
- In closed rooms, **air quality and indoor climate** help to create a sense of well-being. In recreation, living and working areas, an air temperature of 22 °C ± 2 °C and a relative humidity of 45% ± 15% should be aimed for.

SOCIAL RELATIONS

Photo: OFFSHORE WIND ENERGY Foundation © DOTI | Matthias Ibeler

Relationship between employees

The social support provided by colleagues is an important resource for many employees offshore. Of special interest is the strong sense of community and a high degree of mutual help among the employees. Both the perceived social support and the sense of community are more pronounced among employees in the offshore wind industry than among male employees in other occupational groups in Germany (Fig. 13).[66]

It's a really great thing that, after 14 days, you have 55 good friends here, with whom you enjoy spending your time.

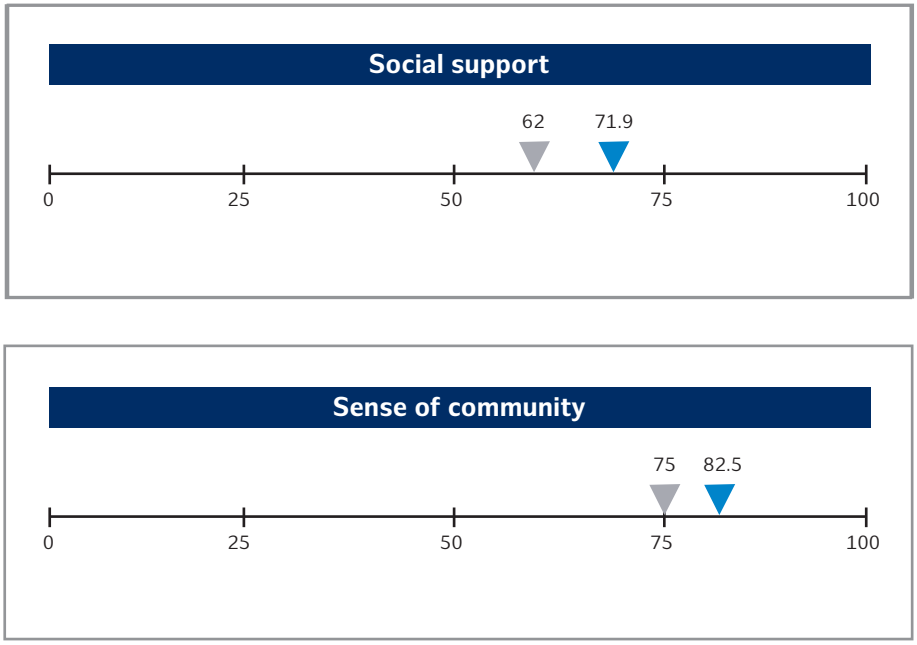


Fig. 13: Social support and sense of community among offshore employees compared to other occupational groups

Mean values of the sample of offshore employees (n=250, green arrows) for the COPSOQ scales "Social support" and "Sense of community". In comparison: mean value from sample of other male employees in Germany (n=4546, grey arrows[67]).

The working atmosphere is mostly perceived as positive by the employees. Most employees can solve work-related problems well with their colleagues. In addition, many employees also have private conversations, which often lead to friendships between team members. Overall, 95% of the respondents are "satisfied" or "very satisfied" with their colleagues. As the offshore wind industry is experiencing dynamic growth, colleagues can meet in different projects, which is perceived as very positive.

66 Nübling, M., Vomstein, M., Nübling, T., Stößel, U., Hasselhorn, H. M. & Hofmann, F. (2011). Erfassung psychischer Belastungen anhand eines erprobten Fragebogens - Aufbau der COPSOQ-Datenbank [Surveying psychological strains with a validated questionnaire – Setting up the COPSOQ data base]. Retrieved from: https://www.copsoq-datenbank.de/xls/copsoqdb_standardtabellen_250811.xls.

67 Nübling, M., Vomstein, M., Nübling, T., Stößel, U., Hasselhorn, H. M. & Hofmann, F. (2011). Erfassung psychischer Belastungen anhand eines erprobten Fragebogens - Aufbau der COPSOQ-Datenbank [Surveying psychological strains with a validated questionnaire – Setting up the COPSOQ data base]. Retrieved from: https://www.copsoq-datenbank.de/xls/copsoqdb_standardtabellen_250811.xls.

All this is important because various studies show that a high level of social support can lead to reduced stress and can have a positive impact on employees' health.[68,69,70,71,72,73]

However, conflicts can also arise as a result of the spatial limitations and permanent contact between employees. These conflicts can result, for example, when colleagues from different companies work together, when employees follow different working methods or are paid differently for the same work.

There are disputes about the fact that people receive varying compensation for the same jobs. I mean, it's loudly discussed why someone else earns more money than I do for the same type of work.

The lack of possibilities for retreat as well as sharing sleep cabins can lead to conflicts between employees, which can be stressful.

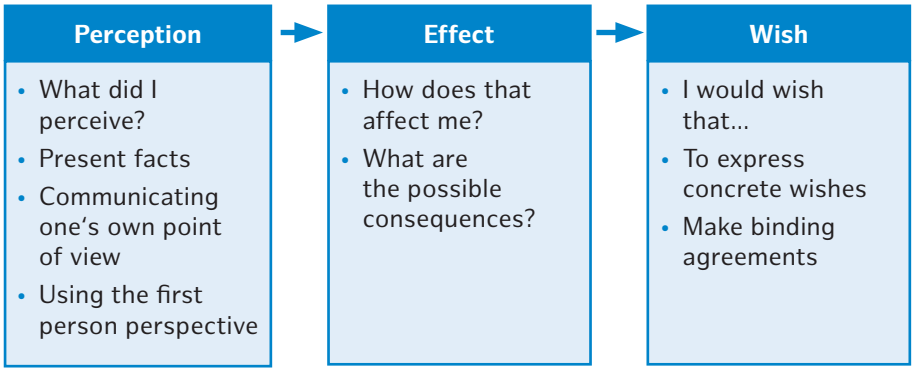
Recommendations for action

Behavioural

- Regular social activities, such as game nights or cooking events, can promote social relations between employees. The desire for more social activities was also expressed by the employees themselves.
- In mentoring programmes, experienced offshore employees can pass on their knowledge to new colleagues as mentors. This promotes mutual exchange, which can have a positive effect on the team atmosphere. The use of mentoring programmes has already proven its worth in related industries, e.g. in seafaring.
- Training in conflict management, problem-solving strategies or stress management can enhance the communication and conflict-solving skills of offshore employees.[74]
- When problems arise between employees, they should be discussed objectively and without accusations. For giving and receiving constructive feedback, these three rules can provide a basic orientation.

68 Berthelsen, M., Pallesen, S., Bjorvatn, B. & Knardahl, S. (2015). Shift schedules, work factors, and mental health among onshore and offshore workers in the Norwegian petroleum industry. Industrial Health, 53, 280-292.
69 Ljosa, C.H., Tyssen, R. & Lau, B. (2011). Mental distress among shift workers in Norwegian offshore petroleum industry - relative influence of individual and psychosocial work factors. Scandinavian Journal of Work Environment and Health, 37, 551-555.
70 Ulleberg, P. & Rundmo, T (1997). Job stress, social support, job satisfaction and absenteeism among offshore oil personnel. Work & Stress, 11, 215-228.
71 Håvold, J.I. (2015). Stress on the bridge of offshore vessels: examples from the North Sea. Safety Science, 71, 160-166.
72 Riethmeister, V., Brouwer, S., van der Klink, J. & Bültmann, U. (2016). Work, eat and sleep: towards a healthy ageing at work program offshore. BMC Public Health, 16, 134.
73 Ross, J.K. (2009). Offshore industry shift work – health and social considerations. Occupational Medicine, 59(5), 310-315.
74 Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA) (2016). Psychische Gesundheit in der Arbeitswelt – Soziale Beziehungen [Mental health in the world of work - Social relations]. Retrieved from: https://www.baua.de/DE/Angebote/Publikationen/Berichte/F2353-2b.pdf?__blob=publicationFile&v=5.

3 rules for constructive feedback[75]



Structural

- There should also be enough possibilities for informal exchanges between employees, e.g. during shared breaks, in community rooms or at sports group offers.
- In order to reduce the risk of conflicts between employees at work, universal working methods and standards should be established for all employees.

75 Deutsche Gesetzliche Unfallversicherung e. V. (DGUV) (2018). Kommunikation. Geben und Nehmen von Feedback [Communication. Giving and receiving feedback]. Retrieved from: https://www.kommmitmensch.de/fileadmin/user_upload/pdf-dokumente/kommmunikation/dguv_kmm_praxishilfe_1_kommunikation_feedback.pdf.

Relationship between employees and executives

The social support provided by superiors is also rated positively by many offshore employees, even though to a lesser extent than the support provided by colleagues. While employees can exchange information on workplace hazards and concerns, discussions with executives on these issues are rare. For employees, it is important that executives take their worries at work seriously (e.g. regarding the challenging access to the installations under critical weather conditions) and have an appropriate way of talking with each other. In general, many employees (60.1%) are satisfied with their superiors' style of leadership.

Recommendations for action

Behavioural

- Executives should be trained for their management tasks and sensitised for their exemplary function.
- An appreciative attitude, appropriate expression and understanding of the concerns of employees are important for executives to treat employees with respect.
- Executives should be sensitised to the subject of bullying in order to be able to recognise harassment at an early stage and to react accordingly.[76]
- At the workplace, executives should promote a positive culture of error. This means that executives should be trustworthy, give acknowledgement for error reports and encourage to report near accidents.[77]
- Regular feedback meetings between employees and executives, either semi-annually or annually, can improve relationships. In order to develop feedback interviews in a structured and appreciative manner, specific feedback rules can be applied, as well as practical tips for improved communication.[78]

76 Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA) (2016). Psychische Gesundheit in der Arbeitswelt – Soziale Beziehungen [Mental health in the world of work - Social relations]. Retrieved from: https://www.baua.de/DE/Angebote/Publikationen/Berichte/F2353-2b.pdf?__blob=publicationFile&v=5.

77 Deutsche Gesetzliche Unfallversicherung e. V. (DGUV) (2018). Fehlerkultur. Mit Fehlern sicher und gesund umgehen [Culture of error. Dealing with error safely and healthily]. Retrieved from: https://www.kommmitmensch.de/fileadmin/user_upload/pdf-dokumente/fehlerkultur/dguv_kmm_handlungsfeld_fehlerkultur_qr.pdf.

78 Deutsche Gesetzliche Unfallversicherung e. V. (DGUV) (2018). Kommunikation. Geben und Nehmen von Feedback [Communication. Giving and receiving feedback]. Retrieved from: https://www.kommmitmensch.de/fileadmin/user_upload/pdf-dokumente/kommmunikation/dguv_kmm_praxishilfe_1_kommunikation_feedback.pdf.

Practical tips for improved communication[79]

- Listen actively to the other person.
- Let the other person finish talking.
- Ask questions when you have not understood something.
- Tell the other person what you have understood.
- Talk about problems and disturbances face to face, it is the only way to change something.

Structural

- Checklists can help executives to reflect on their own leadership behaviour.[80]

Checklist for reflecting the leadership behaviour

The checklist for reflecting the leadership behaviour includes the following elements

- "He/she treats employees as equals."
- "He/she pays attention to mistakes when they endanger a certain standard."
- "He/she adapts the areas of work to the abilities and opportunities for performance of the employees."

Examples of checklists on management behaviour are available from the Federal Institute for Occupational Safety and Health:
https://www.baua.de/DE/Angebote/Publikationen/Berichte/Gd5.pdf?__blob=publicationFile&v

79 Wernecke, I. (o.J.). Kommunikation verstehen Kommunikation verbessern. Bausteine [Understanding communication improving communication. Modules]. Retrieved from: https://www.uniklinik-freiburg.de/fileadmin/mediapool/10_andere/psysoz-beratung/kommunikation.pdf.

80 Stadler, P. & Spieß, E. (2002). Mitarbeiterorientiertes Führen und soziale Unterstützung am Arbeitsplatz [Employee-orientated leadership and social support at the workplace]. Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA) (Ed.). Retrieved from: https://www.baua.de/DE/Angebote/Publikationen/Berichte/Gd5.pdf?__blob=publicationFile&v=1.

International working environment

The cooperation of employees from different countries and cultures is characteristic for the work in the offshore wind industry. Many employees enjoy getting to know people from other countries and improving their language skills during their offshore deployments. In everyday work, English is the official language for communication at the offshore workplace. Insufficient knowledge of English complicates communication. Group-building of employees from the same nation can aggravate difficulties regarding the exchange of information. In addition, employees' levels of experience, education and knowledge of offshore activities may differ considerably.

Recommendations for action

Behavioural

- There are specific language courses for employees working in the offshore wind energy sector. By participating in these language courses, employees can improve their technical vocabulary and overcome language barriers.
- Intercultural training can help employees to cope better with cultural differences in communication behaviour, emotions or hierarchies.
- International evenings, e.g. with typical local food, songs or films, can increase the cultural understanding between employees and contribute to a stronger sense of community.
- Existing differences in qualifications between employees should be identified so that appropriate training can be offered for specific further qualification and knowledge transfer.

Structural

- Diversity management can help to acknowledge employees with their individual strengths and weaknesses and to use their potential properly, no matter what gender, age, origin, religion or culture.[81]

81 Altgeld, T. (2016). Diversity und Diversity Management. Vielfalt gestalten [Diversity and diversity management. Creating diversity]. Retrieved from: https://www.leitbegriffe.bzga.de/systematisches-verzeichnis/strategien-handlungsansaetze-und-methoden/diversity-und-diversity-management-vielfalt-gestalten/.

Absence from family and friends

During their period of absence, offshore employees cannot participate in family life onshore and cannot support their partners, e.g. in housework or raising children. In case of problems at home, the partner is left on his or her own, which can be stressful for the offshore employees. Even in family emergencies, they cannot come home immediately. If bad weather leads to delays during the journey home, this is experienced as an additional burden. Many employees (59.1%) feel that their work and private life are "sometimes" or "often" in conflict, so that they wish to be in both places at the same time (Fig. 14). This may be the case, for example, when employees are unable to attend important family celebrations.

Yes, of course it's a burden, especially if you've just started a family and have a young child... You think a lot about home, of course.

Fig. 14: Perceived conflict between work and private life n=249

Recommendations for action

Structural

- Employees should not have to take additional work-related courses or further training during their off-time onshore so that they can use their free time as such.
- A reliable and early planning of the assignment enables the employees to better plan their private life.[82] This can have a positive effect on the perceived compatibility of offshore work with private life.
- In order to promote the compatibility of offshore work and private life in general, the possibility of an external employee counselling (Employee Assistance Programmes (EAP)) can be provided. Employees can receive advice anonymously and by telephone on various social issues (e.g. family, upbringing, debt counselling). The employer can cover the costs by contracting independent consulting service providers.

82 Institut für Sozialforschung und Gesellschaftspolitik GmbH (2018). Evaluation der Offshore-ArbZV. III. Zwischenbericht im Auftrag des Bundesministeriums für Arbeit und Soziales [Evaluation of the German Offshore Working Time Ordinance III. Interim report on behalf of the Federal Ministry of Labour and Social Affairs]. Köln: Institut für Sozialforschung und Gesellschaftspolitik GmbH.

Homeward communication

Homeward communication is essential for the employees during their assignments to keep in touch with family and friends. However, due to the long distances of offshore wind farms to the mainland, communication channels as well as stable telephone and internet connections are not always available. This complicates communication with relatives and friends and can lead to homesickness among employees.

Generally, the men here are 'tough guys'. But when the telephone for calling home doesn't work, they are suddenly 12 years old again, get really homesick, and then they are useless.

Recommendations for action

Structural

- Internet connections offshore should be expanded and, in general, stable network quality should be ensured so that the use of digital and social media is always guaranteed.
- Various possibilities and enough rest areas should be created for communication so that employees can make undisturbed telephone calls or communicate audio-visually.

KEY MESSAGES

- The employees have a very positive perception of the **sense of community and social support** offshore. This support also helps them to cope better with stress. Team spirit should therefore be encouraged through regular social activities (e.g. game nights).
- The **social support provided by superiors** is also relevant for employees. An appreciative attitude, a positive culture of error and regular feedback should be developed. Executives should reflect on their own (exemplary) behaviour.
- Cooperation between employees from **different countries and cultures** can lead to communication problems and "group-building". Intercultural trainings and international evenings for the employees promote the exchange among each other.
- The **absence of family and friends** can be stressful. Reliable and early planning makes it easier to reconcile offshore work and private life. Employees should not have to take any work-related courses during their free time onshore.
- **Communication with home** during assignments is essential for employees. Stable internet connections and sufficient retreat areas are needed for this.

HEALTHY LIFE OFFSHORE

Health-relevant behaviour is part of the specific lifestyle that people acquire through learning, habituation and processes of social comparison.[83] This includes not only the avoidance of risks, but also the active promotion of health, for example, through enough physical activity and a healthy diet. Changes in behaviour, for which self-responsibility plays an important role, are difficult to achieve, since unhealthy behaviours often have a rewarding effects in the short term – especially in case of stress at work and in private life.[84] Health education that goes beyond the simple passing on of knowledge or the provision of information usually fails in practice. Therefore, flanking actions are useful to support changes in behaviour (e.g. smoking bans).

Basically, I think, a good education beforehand about various health issues would be useful. The problem offshore is that many would not be willing to show any weakness and accept such offers on site.

The Risk Behaviour Model – Why is it not enough to spread information on health?

The Risk Behaviour Model assumes that most people are willing to take risks if they can satisfy their needs. In the case of harmful behaviour, positive short-term effects are experienced which represent a strong motivation for action. Getting used to harmful behaviour is then achieved through cognitive trivialisation (selective evaluation of information, comparison with worse dangers, rejection of personal consequences, overestimation of known exceptions, cost-benefit analysis).

83 Siegrist, J. (2012). Gesundheitsverhalten – psychosoziale Aspekte [Health behaviour – psychosocial aspects] (p. 139-150). In: F. W. Schwartz et al. (Eds.) Das Public Health Buch – Gesundheit und Gesundheitswesen [The public health book – Health and healthcare system]. München, Jena: Urban & Fischer Verlag.

84 Siegrist, J. (2012). Gesundheitsverhalten – psychosoziale Aspekte [Health behaviour – psychosocial aspects] (p. 139-150). In: F. W. Schwartz et al. (Eds.) Das Public Health Buch – Gesundheit und Gesundheitswesen [The public health book – Health and healthcare system]. München, Jena: Urban & Fischer Verlag.

Smoking behaviour

In our survey, around 35% of offshore employees stated that they smoke regularly. This corresponds approximately to the proportion of smokers in the German male population (current results from various studies: approx. 30-33%).[85] More than half of the smokers state that they smoke more cigarettes offshore than onshore. Therefore, the duty-free sale of tobacco products to employees offshore should be viewed critically.

Recommendations for action

Behavioural

- Employees offshore should continue to be reminded of the harmful effects of tobacco. Information media that have a passive effect on employees (e.g. posters or leaflets in the canteen and other common areas) are especially suitable.
- The operators of offshore wind farms should draw attention to existing and established methods to stop smoking. The company's medical service or managers should initiate smoking cessation programmes to support employees in quitting smoking, especially when working offshore.
- Employees should support each other in giving up smoking and be actively involved in smoking cessation programmes.

Structural

- Due to the strict fire protection regulations, smoking indoor is only permitted to a limited extent. To protect non-smokers from the harmful effects of passive smoking, special smoking areas should be implemented. There are both special smoking cabins and offshore containers that are used as smoking areas so that toxic substances do not enter the surrounding air.
- Smoking areas should be designed to be as simple as possible so that they do not provide an additional incentive to stay there more often or longer.
- Ideally, no tobacco products should be available on the platforms or in the accommodation. If these products are offered, they should at least not be cheaper than onshore.
- Incentives by the employer to non-smokers or to stop smoking could motivate smokers to take part in a smoking cessation programme.

85 Deutsche Hauptstelle für Suchtfragen e. V. (2018). Daten und Fakten zu Tabak [Data and facts about tobacco]. Retrieved from: http://www.dhs.de/datenfakten/tabak.html.

Physical activity

Regarding physical activity, our survey results indicate that offshore employees generally pay more attention to adequate physical activity compared to the general male population.[86] However, about a quarter of offshore employees report that they move less during offshore deployments than during their free time onshore. The reasons for this are the lack of offers as well as too small and insufficiently equipped fitness rooms. In addition, employees are often exhausted after work. Nevertheless, exercise helps to reduce stress and can relieve muscle tension.[87] It also has a positive effect on the ability to recover and on the quality of sleep. In addition, regular exercise has positive effects on the cardiovascular system and the fat and sugar metabolism. For both exercise and nutrition, it can be stated that the employees who show a high level of health-promoting behaviour onshore often keep to this less well offshore. In contrast, those who tend to pay rather little attention to exercise and healthy eating onshore do this more offshore.

Recommendations for action

Behavioural

- Adults should exercise for at least 2.5 hours a week, spread over several days, on a moderately strenuous level, e.g. five days a week for 30 minutes each.[88]
- Even when space is limited, it is possible to engage in physical activity to promote health. There is a variety of exercises, tips and tricks for physical activity on ships that can also be used in the offshore environment.[89]
- It is advisable to provide employees with a range of sports courses as well as trainings and individual coaching/consultation (e.g. on topics such as back health) by trainers or physiotherapists. Group courses, e.g. for exercise, can strengthen the sense of community among employees. The aim of individual training courses should be an individual counselling on the possibilities of physical balance, taking into account the particular physical strain caused by offshore work. Office employees, for example, need more physical exercise to compensate their mainly seated work, while technicians who are already exposed to physically demanding work should do more balancing exercises to counteract the effects of non-ergonomic postures or one-sided muscle strains.
- Competitions often have a positive motivational character; “team challenges” (e.g. step competitions with fitness trackers or step counters) could motivate for physical activity. Together with other employees, the joy of exercise can be increased.[90]

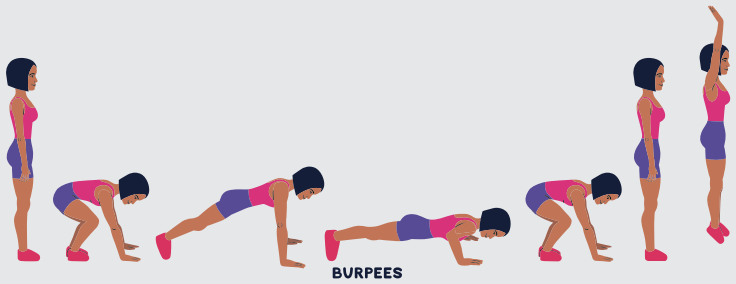
86 Krug, S., Jordan, S., Mensink, G. B. M., Müters, S., Finger, J. D. & Lampert, T. (2013). Körperliche Aktivität. Ergebnisse der Studie zur Gesundheit Erwachsener in Deutschland [Physical Activity. German Health Interview and Examination Survey for Adults] (DEGS1). Bundesgesundheitsblatt, 56, 765–771.
87 Fuchs, R. & Klaperski, S. (2017). Stressregulation durch Sport und Bewegung [Stress regulation through sports and exercise]. In: R. Fuchs & M. Gerber, Handbuch Stressregulation und Sport [Handbook stress regulation and sports]. Springer: Berlin, Heidelberg.
88 World Health Organisation (2010). Global recommendations on physical activity for health. Physical activity and adults. Retrieved from: http://www.who.int/dietphysicalactivity/factsheet_adults/en/.
89 Example for an exercise for seafarers: https://www.trainingonboard.org/.
90 Bundesministerium für Gesundheit (BMG) (2016). Ratgeber zur Prävention und Gesundheitsförderung [Advisor for prevention and health promotion] (9. Ed.). Retrieved from: https://www.bundesgesundheitsministerium.de/fileadmin/Dateien/5_Publikationen/Praevention/Broschueren/2016_BMG_Praevention_Ratgeber_web.pdf.

Structural

- Fitness rooms with as much space and equipment as possible for simultaneous use by several employees must be provided.
- In the fitness rooms, instructions with exercise tips and exercises to compensate for specific ergonomic problems should be available. .
- Experienced employees can support their colleagues in using the equipment.[91]
- In the leisure and recreation rooms, freely available literature on the topics of fitness and nutrition can be offered.

5 exercises with your own body weight in a small space

1. Jumping jacks are good for warming up the body.
2. Rope jumping burns calories and trains the whole body.
3. Push-ups: it is important to keep your arms, back and shoulders straight. The elbows should be held close to the side of the body.
4. Knee-bends train the muscles of the bottom and thighs.
5. Burpees also train the whole body and burn calories.



91 Mearns, K. & Hope, L. (2005). Health and well-being in the offshore environment: The management of personal health (Research report; No. 305). Sudbury: Health and Safety Executive.

Nutrition

In any case, it [food] is an important issue. Good work – good mood. Good food – better mood!

Food provides the necessary energy that we need for our everyday life. In the long term, nutrition also has an influence on very different diseases (fat metabolism disorders, diabetes, cardiovascular diseases and pathological overweight), which is why it is an important factor in health promotion. In addition, food, especially in offshore areas, plays an important role as a motivator and to increase general well-being. Adequate food supply is of great importance for offshore employees.[92]

The majority of employees say they eat "moderately healthy" food both onshore and offshore. Many employees (35%) say they eat better at home than offshore. Satisfaction with the offered food is generally highly dependent on one's own preferences and therefore very subjective. The majority of employees (65%) perceive the offered food offshore as "good" or "very good". According to the employees, the reasons for a worse nutrition offshore are the low quality of the food and the lack of influence on the menu. The results show that opinions on the quality of the offered food differ widely. The canteen is particularly relevant for a good working atmosphere and the satisfaction of offshore employees. In addition to the pleasant design of the rooms and seating, attention must be paid to the design of opening hours so that employees can plan their time off independently, so that food is available throughout shifts and so that the opening hours of the canteen do not lead to restrictions on other activities (cf. → Physical activity, p. 70). It is very important to offer meals that make it easier for employees to choose a balanced nutrition and consider their different needs.

The individual calorie demand can vary depending on the activity. For employees who absolve physically strenuous work, the calorie demand is much higher than for employees with office workplace. This must be considered when planning the food offers in the canteen.

Recommendations for action

Common nutritional recommendations can be applied to the offshore environment. The choice of healthy meals is facilitated and supported by an appropriate range of products available.

92 Riethmeister, V., Brouwer, S., van der Klink, J. & Bültmann, U. (2016). Work, eat and sleep: towards a healthy ageing at work program offshore. BMC Public Health, 16, 134..

Behavioural

- The benefits of a healthy nutrition should definitely be made obvious to the employees. Company physicians can point this out during the medical fitness examinations. Drawing up individual nutrition plans with the help of a nutritionist can help to achieve a balanced diet tailored to the needs of the different groups of employees.[93]
- Nutrition should be designed according to the recommendations of the nutrition pyramid and the "10 rules" of the German Nutrition Society (DGE).[94]
- The participation of employees in the design of their menu should be encouraged. Employees should be able to express their opinions about the food. For this purpose, for example, a mailbox could be set up in the canteen so that employees can leave their opinions and wishes anonymously and without much effort.[95]

Nutrition pyramid

Nutrition pyramid (© German Nutrition Society (DGE), 2017)

93 Mearns, K. & Hope, L. (2005). Health and well-being in the offshore environment: The management of personal health (Research report; No. 305). Sudbury: Health and Safety Executive.
94 Deutsche Gesellschaft für Ernährung e. V. (DGE) (2017). Vollwertig essen und trinken nach den 10 Regeln der DGE [To eat and drink nutritiously by the 10 rules of the DGE]. Retrieved from: https://www.dge.de/fileadmin/public/doc/fm/10-Regeln-der-DGE.pdf.
95 Deutsche Gesellschaft für Ernährung e. V. (DGE) (2019). Essen am Arbeitsplatz und in der Kantine [Eating at the workplace and in the canteen]. Retrieved from: https://www.dge.de/ernaehrungspraxis/bevoelkerungsgruppen/berufstaetige/essen-am-arbeitsplatz-und-in-der-kantine/.

10 guidelines of the German Nutrition Society (DGE) for a wholesome diet[96]

1. Enjoy food diversity: make use of the diversity of foods and eat versatile. Choose mainly plant-based foods. No single food can supply all nutrients. The more varied you eat, the lower is the risk of an unbalanced diet.
2. Favour whole-grain foods: whole-grain foods will keep you satiated longer and contain more nutrients than white flour products. Whole-grain dietary fibres reduce the risk of type 2 diabetes mellitus, dyslipidaemia, colon cancer and cardiovascular diseases.
3. Vegetables and fruit – take 5 a day: vegetables and fruit supply you with plenty of nutrients, dietary fibre and phytochemicals and also contribute to satiation. Vegetables and fruits lower the risk of cardiovascular and other diseases.
4. Consume milk and dairy products, such as yoghurt and cheese daily, fish once to twice a week. If you eat meat, you should not consume more than 300 to 600 g per week.
5. Choose health-promoting fats: prefer vegetable oils like rapeseed oil and margarines produced therefrom. Avoid hidden fats. Fat is often "invisibly" present in processed foods like sausage, pastry, sweets, fast food and convenience products.
6. Reduce sugar and salt intake: sugar-sweetened foods and beverages are usually low in nutrients and contain unnecessary calories.
7. Water is the best choice: drink about of 1.5 litres per day. Water or other calorie-free beverages, such as unsweetened teas, are the best choice.
8. Prepare carefully cooked dishes: cook food at low temperatures with little water and little fat. Avoid burning, since burnt parts contain harmful substances.
9. Mindful eating and enjoying: take a break while you eat and allow plenty of time for eating. Eating slowly and consciously promotes the sense of satiation.
10. Watch your weight and stay active.

96 Deutsche Gesellschaft für Ernährung e. V. (DGE) (2017). Vollwertig essen und trinken nach den 10 Regeln der DGE [10 guidelines of the German Nutrition Society (DGE) for a wholesome diet]. Retrieved from: https://www.dge.de/fileadmin/public/doc/fm/10-Regeln-der-DGE.pdf.

Structural

- It is essential to develop quality criteria for the choice of the catering. In principle, the caterer should be required to follow the DGE's quality standards for company catering[97] or to be certified. This ensures a healthy food supply of good quality and sufficient variety, also taking into account different forms of nutrition (meat consumption, vegetarian, and vegan).
- The calories contained in the various dishes should be labelled.
- Posters with recommendations for a healthy diet should be displayed at the food counter or in the dining room; the German Nutrition Society (DGE) or the Federal Institute for Agriculture and Nutrition, for example, offer attractive posters with a nutrition pyramid.
- The opening hours of the canteen should be arranged in such a way that all employees can eat their meals without time pressure.
- Installed water dispensers are a simple way of making it easier for employees to drink enough.
- In addition to the main meals, healthy snacks should also be provided. Fresh fruit can always be made available in leisure and break rooms.

DGE quality standard for company catering – key points[98]

It is important to offer

- a nutritionally balanced selection of food for lunch and snacks,
- low-energy, unsweetened beverages for the sufficient supply with liquid,
- an appealing design of the dining rooms and a pleasant atmosphere in order to increase acceptance of the offered food,
- competent employees in the kitchen and serving area.

97 Deutsche Gesellschaft für Ernährung e. V. (DGE) (2015). DGE-Qualitätsstandard für die Betriebsverpflegung [DGE quality standard for company catering]. Retrieved from: https://www.jobundfit.de/fileadmin/user_upload/medien/DGE-Qualitaetsstandard_Betriebsverpflegung.pdf.

98 Deutsche Gesellschaft für Ernährung e. V. (DGE) (2015). DGE-Qualitätsstandard für die Betriebsverpflegung. [Quality standard of the DGE for company canteens.] Retrieved from: https://www.jobundfit.de/fileadmin/user_upload/medien/DGE-Qualitaetsstandard_Betriebsverpflegung.pdf.

Sleep, relaxation and recreation

The installers (...) have 2-man cabins, they don't have their own bathroom, they actually don't have a real retreat for themselves. And that stresses massively. That brings also many, many conflicts.

Enough sleep and rest after work are important for everyone. Offshore employees have a particularly high need for rest and recovery due to the demands and strains inherent in their work (cf. → Working time, p. 37). In addition, restful sleep is essential for the safety of employees and the avoidance of errors at work. However, employees often report poorer quality of sleep during offshore operations, they have more difficulties falling asleep and frequent problems sleeping through. Sleep is influenced by many environmental factors, in particular noise, temperature, humidity and light. Limited privacy, e.g. when the cabin is shared with other employees, also has a negative impact on quality of sleep. Therefore, cabins should provide adequate retreat and a quiet, sleep-promoting environment.

So with technicians, they can definitely do that [switch off mentally from work]. But now with the management and with the electricians, (...) there, it was already the case that some of them sat at the desk until late into the night and could hardly switch off.

On an individual level, the quality of sleep is also influenced by the experience of stress. Some employees have a problem with a high level of stress during offshore deployments, which means that it is hard for them to stop thinking about work at the end of the day.

Therefore, it is very important to enable employees to rest and relax sufficiently. During these periods, employees can also use breathing exercises, muscle relaxation exercises and mindfulness techniques to recover and mentally distance themselves from their work.[99]

Recommendations for action

Behavioural

- Employees should be provided with a range of guided, target group-related courses to cope with stress and conflict situations and to learn relaxation techniques.
- The use of earplugs for sleeping should be avoided, as employees could overhear warning signals in emergencies.

Advices for improved individual sleep hygiene are, for example:[100,101]

- Establish routines: it is recommended to go to bed and get up more or less at the same time each day. In changing shifts, it is not always possible to keep the same sleeping times. However, it is important to establish a personal routine that shows the body: "Now, it is bedtime".
- Sleep when sleepy: if you try to fall asleep for more than 20 minutes and cannot make it, get up and do something calming or boring until you get tired. No stimulating or interesting activities should be carried out.

99 International Seafarers' Welfare and Assistance Network (ISWAN) (2018). Seafarer's health information programme. Managing stress and sleeping well at sea. Retrieved from: https://seafarerhelp.org/assets/downloads/Managing-Stress-and-Sleeping-Well-at-Sea.pdf.

100 Bundeszentrale für gesundheitliche Aufklärung (BZgA) (2018). Regeln für einen gesunden Schlaf [Rules for healthy sleeping]. Retrieved from: https://www.maennergesundheitsportal.de/themen/gesunder-schlaf/regeln-fuer-einen-gesunden-schlaf/.

101 Government of Western Australia - Department of Health (2016). Sleep hygiene – Information sheet. Retrieved from: http://www.cci.health.wa.gov.au/~/media/CCI/Mental%20Health%20Professionals/Sleep/Sleep%20-%20Information%20Sheets/Sleep%20Information%20Sheet%20-%2004%20-%20Sleep%20Hygiene.pdf.

- Avoid caffeine (coffee, tea, coke, etc.) and smoking 4 to 6 hours before going to bed.
- You should exercise regularly or do sports (cf. → Physical activity, p. 70), but not shortly before going to bed. Before going to bed, mental and physical activity should be gradually reduced, depending on preference and personality. Additionally, relaxation techniques help.
- Bed is for sleeping: no e-mails should be answered in bed, for example.
- No bright light should be switched on at night.
- If you do not work shifts, you should avoid naps at noon, especially if you suffer from problems falling asleep and/or sleeping through.
- When working shift and taking a nap at noon, this should be limited to 20-30 minutes. You should also wait about 30 minutes between waking up and starting activities.

Structural

- Single cabins are preferable. This applies for both long and short offshore stays.
- A quiet environment must be provided in which employees can sleep as undisturbed as possible.

The ideal offshore cabin

- Single accommodation.
- Good isolation against noise, vibrations and smells.
- If possible, with daylight and appropriate darkening devices.
- Adjustable room temperature – temperatures around 18 °C (in any case below 20 °C) are ideal for sleeping.
- Humidity should be 45% ± 15%.
- Possibility of natural ventilation and effective, quiet ventilation system.
- Access to communication channels.

KEY MESSAGES

- The offshore workplace is a good place to implement activities for **health promotion**, since the working and living environment offshore can be easily regulated.
- Already during the **medical fitness examinations (offshore aptitude tests)**, company physicians should talk about the foundation of healthy behaviour (with regard to nutrition, rest, exercise and smoking behaviour).
- Many employees **smoke** more offshore than onshore. In addition to company offers for quitting smoking, the lower price of tobacco products offshore should be abolished.
- Sufficient and moderately strenuous **exercise** is beneficial to health. Therefore, well-equipped fitness rooms which can be used by several employees at the same time are necessary. Instructions for exercises and tips for daily activities should be provided.
- The offer of a balanced **nutrition** should be ensured. When choosing a suitable caterer, the quality standards for company catering of the German Nutrition Society (DGE) can help. Employees should follow the dietetic recommendations of the DGE for their nutrition.
- Offshore employees have a particularly high **need for sleep and rest** due to their work schedules. A sleep-promoting design of the accommodations is absolutely essential: Individual cabins shielded from sound and vibration are ideal. The temperature (optimum 18-20 °C) and humidity (optimum 45% ± 15%) should be adjustable.

Empirical results from the project "BestOff" have already been published in the following places:

Velasco Garrido, M., Mette, J., Mache, S., Harth, V. & Preisser, A. M. (2018). Sleep quality of offshore wind farm workers in the German exclusive economic zone – a cross-sectional study. BMJ Open, 8, e024006.

Mette, J., Velasco Garrido, M., Mache, S., Harth, V. & Preisser, A. M. (2018). Flexible Arbeitsformen und die Tätigkeit in Offshore-Windparks [Flexible forms of work and the employment in offshore wind farms]. Flugmedizin Tropenmedizin Reisemedizin, 25, 249-254.

Mette, J., Velasco Garrido, M., Preisser, A. M., Harth, V. & Mache, S. (2018). Workplace health promotion for employees working in offshore wind parks in the German exclusive economic zone: a mixed-methods-study. BMJ Open, 8, e020493.

Mette, J., Velasco Garrido, M., Preisser, A. M., Harth, V. & Mache, S. (2018). Linking quantitative demands to offshore wind workers' stress: do personal and job resources matter? A structural equation modelling approach. BMC Public Health, 18, 934.

Velasco Garrido, M., Mette, J., Mache, S., Harth, V. & Preisser, A. M. (2018). A cross-sectional survey of physical strains among offshore wind farm workers in the German exclusive economic zone. BMJ Open, 8, e020157.

Mette, J., Velasco Garrido, M., Harth, V., Preisser, A. M. & Mache, S. (2018). Healthy offshore workforce? A qualitative study on offshore employees' occupational strain, health, and coping. BMC Public Health, 18, 172.

Mette, J., Velasco Garrido, M., Harth, V., Preisser, A. M. & Mache, S. (2017). ‚It's still a great adventure' – exploring offshore employees' working conditions in a qualitative study. Journal of Occupational Medicine and Toxicology, 12, 35.

Velasco Garrido, M., Mette, J., Mache, S., Harth, V. & Preisser, A. M. (2017). Belastungen und Gefährdungen der Beschäftigten in der Offshore-Windindustrie [Strains and hazards for employees in the offshore wind industry]. Arbeitsmedizin Sozialmedizin Umweltmedizin, 52, 134-137.

Mette, J. (2016). BestOff – Sicherheit und Gesundheit in der Offshorewindindustrie durch Kompetenzentwicklung, Koordination und lernförderliche Unternehmenskultur [BestOff – Safety and health in the offshore wind industry through competence development, coordination and a corporate culture conducive to learning]. Flugmedizin Tropenmedizin Reisemedizin, 23(5), 34-35.

Mette, J., Velasco Garrido, M., Preisser, A. M., Harth, V. & Mache, S. (2016). Psychische Belastung von Beschäftigten in der deutschen Offshore-Windindustrie [Psychological strains of employees in the German offshore wind industry]. Zentralblatt für Arbeitsmedizin, Arbeitsschutz und Ergonomie, 66(5), 307-311.

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