

Psychosocial work strains and well-being in the process of adapting to occupational stress: longitudinal studies of offshore rig workers

BACKGROUND

The work on offshore rigs is related to a number of physical and mental burdens. The subject matter of the paper refers to the assessment of the relation between the mode of adapting to occupational stress and the feeling of well-being among the employees of offshore rigs in Poland.

PARTICIPANTS AND PROCEDURE

The research procedure is a longitudinal study and encompasses analysis of data between 1993 and 2014. 167 employees of the Polish offshore rigs were studied: all of them were male and the average age was 42. Measuring tools were used to assess the subjective occupational stress, psychosocial work conditions, evaluation of physical and mental well-being and styles of coping with stress.

RESULTS

The perceived level of stress directly affects mental well-being ($r = .19$, $p = .048$): the higher the level of stress, the worse is the mental well-being ($\beta = -.30$). In a considerable part, the dependence between occupational stress and mental well-being may be clarified by the impact of the

style of coping with occupational stress and the rate of stress dynamics ($r = .32$, $p = .004$). The higher the share of task-oriented coping style as compared to the emotion and avoidance-oriented style, the higher is the self-reported mental well-being. The higher the probability of affiliation with the group reporting a decrease in stress, the higher is the self-reported mental well-being. Perceiving stress has no direct or indirect impact on physical well-being ($\beta = .09$; $\beta = .08$; $\beta = -.11$).

CONCLUSIONS

A dependence exists between the process of adapting to stress and the level of the self-reported mental well-being of the rig employees. The higher the probability of adaptation to the difficult situation at work in a way that the self-reported stress is reduced, the higher the self-reported mental well-being. Perceiving stress bears no direct or indirect impact on the physical well-being.

KEY WORDS

occupational stress; mental well-being; physical well-being; work on drilling platforms

ORGANIZATION – 1: WSB University, Gdansk, Poland · 2: Institute of Psychology, University of Gdansk, Gdansk, Poland

AUTHORS' CONTRIBUTIONS – A: Study design · B: Data collection · C: Statistical analysis · D: Data interpretation · E: Manuscript preparation · F: Literature search · G: Funds collection

CORRESPONDING AUTHOR – Aleksandra Peplińska, Ph.D., Institute of Psychology, University of Gdansk, 4 Bażyńskiego Str., 80-952 Gdansk, Poland, e-mail: aleksandra.peplinska@ug.edu.pl

TO CITE THIS ARTICLE – Leszczyńska, I., & Peplińska, A. (2023). Psychosocial work strains and well-being in the process of adapting to occupational stress: longitudinal studies of offshore rig workers. *Health Psychology Report*, 11(2), 89–97. <https://doi.org/10.5114/hpr/156822>

RECEIVED 14.08.2022 · REVIEWED 10.10.2022 · ACCEPTED 22.11.2022 · ONLINE PUBLICATION 15.02.2023

BACKGROUND

Occupational stress is defined as a mental state that reflects a broader process of interaction between an individual and his/her work environment (Lazarus & Folkman, 1984). Occupational stress is a complex process. In a comprehensive examination of occupational stress, it is necessary to account for the relations between an objective work environment and its perception by the employee, between such perception and the experience of stress, and between such perception and changes in behaviour, physiological functions, and health condition. The elements above and the stages of the stress process are a type of varying interaction. The degree of stress awareness changes together with the development of such a state. Individual factors, including personality features, temperament, and coping with stress, are a significant part of this process (Dudek et al., 1999; Cox et al., 2000; Plopa et al., 2020).

The starting point in the discussion on the psychosocial strains, stresses and relations with the employees' well-being is the concept of Karasek (1979; Karasek & Theorell, 1990) which considers the level of job demands, the scope of control and social support at work. The greatest occupational stress takes place when there are such psychosocial conditions in which an individual must meet high job demands, without simultaneously having the possibility of influencing his own work, coupled with low social support from superiors and colleagues. Such a combination of psychosocial factors affects health, understood according to the WHO recommendations as the overall condition of physical, mental, and social well-being, and the necessity of changes at work.

In the discussions about work in an offshore environment, including drilling platforms, the concept of mental stress and the share and role of psychosocial factors as its sources should be given special attention (Leszczyńska & Jeżewska, 2010; Leka, 2004). Exposure to detrimental physical and psychosocial factors takes place concurrently. In this approach, at least two processes are at play: a direct somatic mechanism and a psychological mechanism of stress impact. These two mechanisms do not form alternative explanations for the interaction of the health condition with the detrimental factors, but comprise a single unit, exerting influence at various levels in diverse ways.

Work at offshore rigs takes place in very difficult conditions, which are influenced by extreme environmental conditions, determined by forces of nature and technological processes, which may cause negative health effects on the people employed there. The drilling rig employees are potentially exposed to the eruption of oil, gas, or fire, which puts them under the impact of permanent stress. They are also exposed to dangers related to offshore drilling operations, 'access' to the workplace by helicopter or,

in the case of adverse weather conditions, by ship (Leszczyńska & Jeżewska, 2010; Leszczyńska, 2016; Wang & Chen, 2020).

Apart from the objective factors, related to temperature, light, noise, dust, radiation and occurrence of various other detrimental factors, there is another, frequently encountered group of factors in the work environment that are the cause of health consequences via the mechanism of stress. These are the so-called psychosocial factors, which emerge in specific social and organizational work conditions, while their potentially detrimental effect on health is determined by the psychological assessment of the event on the individual: whether it represents a threat, a limitation depriving him of some important values, or represents a challenge for his capacity, aspirations, etc. (Dudek et al., 1999). The negative meaning assigned to a situation triggers off specific emotions, which release more changes in the body that may have health consequences.

The above-listed stress-generating effects may have negative consequences for individual health categories and good feeling at work, the effect of which may be various types of somatic or mental disorders and, at times (Morken et al., 2007; Carotenuto et al., 2012; Leszczyńska et al., 2007; Leszczyńska & Jeżewska, 2010; Plopa, 1996) – in extreme cases – the necessity of resigning from the work being undertaken. Occupational stress may be the cause of muscle and skeletal pain, disorders in the cardiovascular and gastrointestinal systems, and mental disorders (Chen et al., 2005; Bjerkan, 2010, 2011). Muscle and skeletal pains are the most frequent ailments that affect the majority of employees in modern society. Significant psychosocial factors affecting muscle and skeletal problems are work requirements, freedom concerning decision-making, stress symptoms, social support, type A behaviour, and psychological agitation. The authors of studies on the employees of drilling platforms, apart from detailed categories of ailments, often consider a general division into physical and mental ailments (Bjerkan, 2010; Chen et al., 2005). In the studies of Bjerkan (2010, 2011) about the relations between health, safety and the work environment, the following health indicators are important: muscle and skeletal pains (neck, shoulder, back, knees, hips), allergic reactions and hearing disorders. Norman et al. (1988) found that muscle and skeletal pain are the main causes of medical leave among employees in this industry, as well as the most frequent cause of the loss of a license for work in the Norwegian oil industry (Horneland et al., 2011). This allows us to conclude that muscle and skeletal pain is a major problem of work at offshore installations. When comparing the tests of employees of drilling platforms performed by various authors, the conclusion may be drawn that the most frequent ailments in this industry are the categories of muscle and skel-

Irena Leszczyńska,
Aleksandra
Peplińska

etal pain (Bjerkan, 2010; Chen et al., 2005), cardiovascular ailments (Horneland et al., 2011), respiratory ailments, hearing impairment, endocrinological ailments (diabetes) and nervous system ailments.

Medical and psychological reference books feature an extensive number of definitions of health (Heszen & Søk, 2007). The general understanding of health rarely reflects only the medical mode of understanding of this concept; it is usually combined with the criteria of well-being and being able-bodied (Puchalski, 1997). Combining health with mental well-being is, in turn, related to other (than just the absence of a disease) factors and sensations such as satisfaction with life, work, and family life. Subjective assessment of health conditions, both in the somatic and mental dimensions, is as important as an objective assessment. Nevertheless, the subjective assessment of health comprises a holistic representation of health which, perforce, is not detailed and cannot be the proper assessment of actual health (Bjerkan, 2010). Such subjective assessment may, however, be more important in a certain sense, as it designates health behaviour and the perceived quality of life. The authors of studies on employees of drilling platforms, apart from detailed categories of ailments, often take a general division into physical and mental ailments into account (Bjerkan, 2010; Chen et al., 2005).

Hence, the health consequences of occupational stress and coping with it are diverse: they consist of both subjective and objective aspects. Health indicators, as the probable consequences of occupational stress, may be divided at least into three categories, depending on the level of objectivity in studying them:

1. Level of objective indicators, e.g., number and type of ailments, BMI.
2. Level of self-reported subjective indicators: assessment of physical and mental well-being, overall perception of own health.
3. Behavioural level: behaviour that may be related to stress, but of which the employees may not be fully aware: smoking, nutritional habits (at work on the rig, or at home), insomnia as a consequence of shift work, absences at work.

In the present paper, we focus on the latter approach, i.e., subjective statements of employees about the assessment of their physical health and mental well-being.

A theoretical model has been designed, the objective of which is to clarify health consequences (physical health and mental well-being) using a mechanism of impact of work conditions, both direct and indirect, via the stress dynamics and the style of coping with stress. Stress dynamics and the style of coping with stress are the mediators of these dependencies. The concept of stress dynamics is understood as a process, as a result of which the employees adapt during 20 years of observations; stress dynamics indicate the mode in which the employees of rigs adapt to the diffi-

cult and stressful work conditions. The research problem consisted of determination of the mode in which the process of adapting to stress at work for 20 years (type of stress dynamics) is related to the subjective assessment of physical and mental well-being among the employees of drilling platforms.

PARTICIPANTS AND PROCEDURE

PARTICIPANTS

167 employees of drilling platforms were covered by the study, men only, average age: 42 years, average job seniority: 12 years.

MEASURES

The following research methods were applied:

Questionnaire for Subjective Evaluation of Work (Dudek et al., 1999). The questionnaire concerns subjective opinions of workers on a sense of mental workload, lack of rewards at work, a sense of insecurity caused by the organization of work, social contacts, sense of threat, physical disturbance, unpleasant working conditions, lack of control, lack of support and accountability. The questionnaire consists of 57 items describing various job characteristics; next to each statement are numbers from 1 to 5, which indicate the degree to which the characteristic is burdensome to the evaluator. An indicator of the level of perceived stress is the sum of points circled by the person surveyed. The level of the coefficient α reliability was from .49 to .93

The Psychosocial Work Conditions Questionnaire (Cieślak & Widerszal-Bazyl, 2000) was used for the assessment of psychosocial conditions of work. The questionnaire consists of 100 statements which the subject rates on a 5-point scale. The questions in the test refer to opinions about the assessment of strains on three scales: job demands; control at the workplace; social support experienced by the employees at the workplace, and additional scales about the assessment of the physical and mental well-being and the necessity of changes at work. The scale of well-being examines the physical well-being (overall assessment of physical health and occurrence of somatic symptoms: headaches, nausea, stomach and heart ailments) and mental well-being (assessment of the occurrence of negative emotional states: irritation, despondence, loneliness, attention deficits, self-esteem, and self-confidence, satisfaction with life and work). The level of the coefficient α reliability was from .82 to .94.

Coping Inventory for Stressful Situations (CISS) by Endler and Parker (1990), which measures the styles of coping in difficult situations: task-oriented style,

*Work strains,
well-being
and occupational
stress of offshore
rig workers*

emotion-oriented style, and avoidance-oriented style (Strelau & Jaworowska, 2020). The questionnaire consists of 48 statements on various behaviours people may engage in when faced with difficult situations. The respondent specifies on a 5-point scale the frequency of his or her behaviour. The test shows high internal consistency of the individual scales (Cronbach's α range of .78-.90) and satisfactory stability.

Data from the author's self-reported employee health indicators survey were also used for the analysis. It included questions about employees' assessment of their own physical and mental health, as well as opinions about the impact of work on various aspects of their lives: stress levels at work, at home, belief in the effectiveness of coping with difficult situations, attachment to the company and others. Items were rated using a 10-point Likert scale (10 points: highest rating, 1 point: lowest rating).

PROCEDURE

The study was carried out in natural conditions, at the workplace, i.e., on drilling platforms during several stays of a few days over 20 years between 1993 and 2014. The same employees participated in the study for over 20 years in basically identical physical work conditions at two drilling platforms. Over this time, there were no changes in the respondents' jobs, workplace conditions, work subordination, or management and workplace safety procedures. Each employee was examined several times, at average intervals of 3-4 years. The surveys carried out were linked to the cyclical, mandatory periodic examinations to which oil rig workers are subject.

RESULTS

STRESS DYNAMICS

To determine the types of stress dynamics, cluster analysis using the Ward method was carried out, based on the Euclidean distance matrix among the

respondents, calculated for their mutual similarities in dimensions specified by the parameters of the square function, i.e. 'a', 'b' and 'c'. Thanks to this, classification of types of stress dynamics is possible.

The dendrogram suggests that there are probably three groups of persons (men) with different stress dynamics in the studied population. Distinguishing three groups allows 51% of the differentiation (variance) of results among persons to be explained, which is a very satisfactory result.

To describe the distinguished clusters, a one-way ANOVA test was performed, where the independent variable is the type of the dynamics (distinguished cluster), while the dependent variables are the parameters of the square function, 'a', 'b', and 'c'. The analysis allows us to determine which types of dynamics differ from one another concerning individual parameters describing such dynamics.

The results of the analysis and the comparisons showed that the three groups differ strongly from one another, and the very high value of F statistics testifies to this, which is always very high statistically ($p < .001$). In this case, it may be said that the relationship between the model parameters and the type of dynamics is very strong within all parameters of the square function. Additional post-hoc comparisons show that each group differs from the other ones ($p < .05$).

The first cluster is characterized by quite a high starting point in comparison to the other groups on the third standard ten score ($M = 6.28$, $SD = 0.55$); however, such persons are also characterised by a tendency for drops in the stress levels over time ($M = -0.51$, $SD = 0.12$) and simultaneously such a drop has almost a permanent character ($M = 0.06$, $SD = 0.11$). In other words, the level of stress in such persons is systematically decreasing. This group was called 'stress resisting' (SR).

The second cluster comprises persons starting from a very low level of stress ($M = 1.03$, $SD = 0.58$), while in these persons, stress is systematically growing ($M = 0.89$, $SD = 0.09$) and at the same time these changes are linear, i.e. systematic ($M = -0.03$, $SD = 0.17$). This group was called 'stress sensitising' (SS).

Table 1

Results of one-way ANOVA

Parameter	Cluster 1 ($N = 49$)		Cluster 2 ($N = 66$)		Cluster 3 ($N = 52$)		Significance test		Post-hoc Tukey's tests		
	M	SD	M	SD	M	SD	$F(2, 164)$	p	1 vs. 2	1 vs. 3	2 vs. 3
a	6.28	0.55	1.03	0.58	5.69	0.62	360.29	.829	< 0.01	< 0.05	< 0.01
b	-0.51	0.12	0.89	0.09	0.09	0.14	293.22	.963	< 0.01	< 0.01	< 0.01
c	0.06	0.11	-0.03	0.17	1.07	0.12	295.88	.802	< 0.05	< 0.01	< 0.05

Persons from the third cluster are characterised by a moderately high (as for this population) initial level of stress ($M = 5.69$, $SD = 0.62$) with a slight upward tendency – the level does not change much ($M = 0.09$, $SD = 0.14$), while in this group it is possible to note the strongest inclination to stress fluctuations ($M = 1.07$, $SD = 0.12$); this means that such persons are characterised by the ‘U’ dynamic: initially, the stress is quite high, then suddenly it drops, to rise once again. This group was called the ‘varying group’ (VG).

level of stress (subjective and objective), stress dynamics, coping with stress, and physical and mental well-being.

The endogenous variable comprises two of the indicators from the Psychosocial Work Conditions Questionnaire, i.e., the subjective impression of mental well-being and the subjective impression of physical well-being.

The path diagram is presented in Figure 1. The relationship between the psychosocial occupational strains is examined, namely job demands, control and support vs. stress, coping with stress, stress dynamics, and mental and physical well-being.

Tables 2 and 3 present the effects of stress mediation and psychosocial factors on the impact on physical and mental well-being.

As shown in diagram ‘e’ (remainder variance – random model error), the mental and physical well-being indicators are related to each other and are not fully independent ($e = .32$). Probably, the subjective assessment of psychosocial strains results from the fact that the employees find it hard to distinguish two types of well-being: physical and mental. The evaluation is comprehensive and seems inseparably linked to this

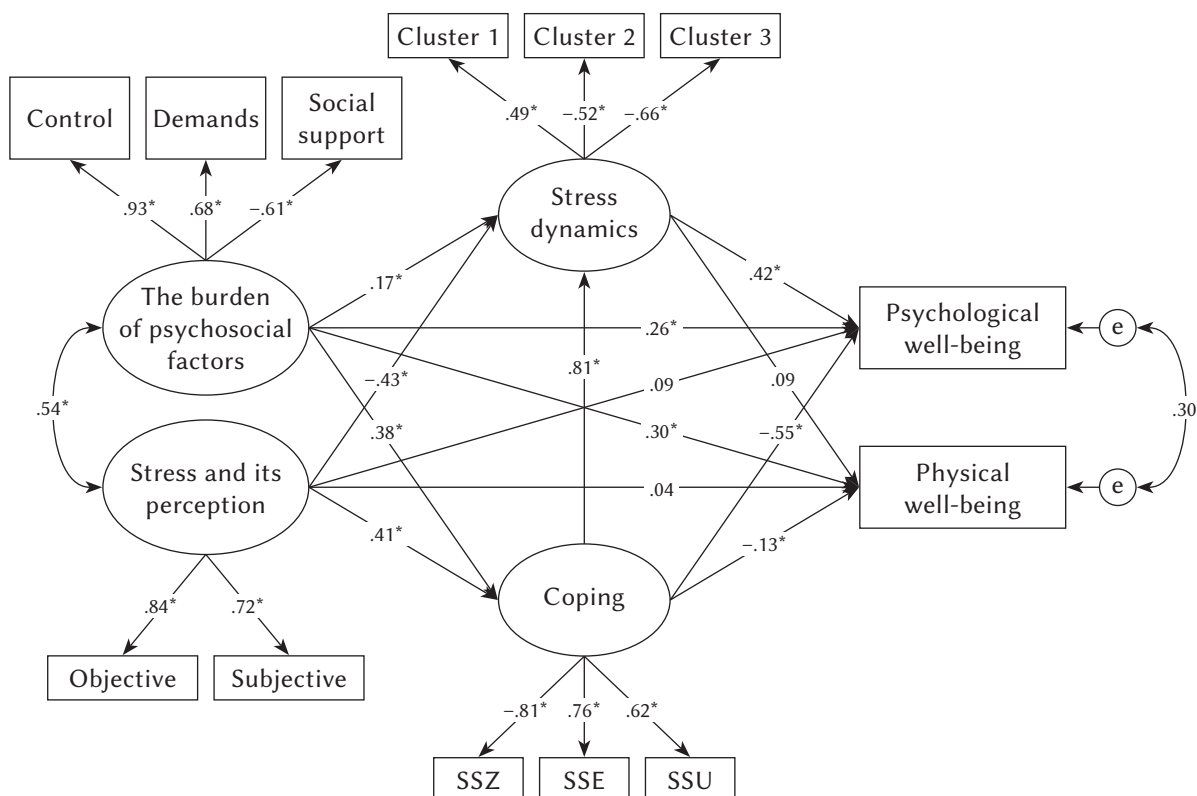
Work strains, well-being and occupational stress of offshore rig workers

STRESS DYNAMICS AND SUBJECTIVE EVALUATION OF PHYSICAL AND MENTAL HEALTH

Health forecasting model. To verify the forecast of stress impact on the physical and mental health of employees of drilling platforms, a path model was subjected to analysis (SEM), tested by the maximum likelihood method. In this model, the dependence among psychosocial factors was tested (job demands, control, and social support – feature examined using the Psychosocial Work Conditions Questionnaire),

Figure 1

Path diagram among psychosocial factors (job demands, control and social support), level of stress (objective and subjective), stress dynamics, coping with stress and physical and mental well-being



Note. SSZ – task-oriented coping style; SSE – emotion-oriented coping style; SSU – avoidance-oriented coping style. $\chi^2(43) = 81.84$, $p < .001$, RMSEA = .074, CFI = .941; * $p < .05$.

Table 2

Summary of analysis of mediation effect of stress and psychosocial factors (job demands, control and social support) in the impact on physical well-being

		Stress and its perception			Psychosocial factors		
		Indirect	Direct	Total	Indirect	Direct	Total
β		-.04	-.11	-.15	-.10	-.17	-.27
95% CI	Lower limit	-.16	-.23	-.30	-.29	-.36	-.54
	Upper limit	.16	.18	.09	.11	.03	.09
<i>p</i>		.124	.163	.089	.094	.109	.095

Irena Leszczyńska,
Aleksandra
Peplińska

Table 3

Summary of analysis of mediation effect of stress and psychosocial factors (job demands, control and social support) in the impact on mental well-being

		Stress and its perception			Psychosocial factors		
		Indirect	Direct	Total	Indirect	Direct	Total
β		-.23	-.19	-.42	-.32	-.29	-.61
95% CI	Lower limit	-.39	-.34	-.77	-.87	-.59	-.97
	Upper limit	-.03	-.01	-.15	-.11	-.08	-.23
<i>p</i>		.031	.048	.006	.004	.009	.001

assessment; it is more related to the specific individual subjective dependence between physical and mental well-being (part of which is unexplained and correlated between mental and physical well-being).

Mental well-being. The psychosocial strains are directly related to the level of perceived stress ($\beta = .54$), which is understandable: the higher the job demands, with a lack of control over what happens at work, and the lower the social support at work, the higher is the feeling of occupational stress. Due to this, psychosocial strains at work have a direct impact on mental well-being ($\beta = .26$), and indirect through the styles of coping with stress and stress dynamics. The psychosocial burdens directly influence mental well-being via stress dynamics, i.e., the mode of adapting to it over 20 years of work and via styles of coping with stress ($r = .32, p = .004$).

The self-reported level of occupational stress has a direct impact on mental well-being ($r = .19, p = .048$), where the higher the level of stress is, the worse is the mental well-being ($\beta = -.30$), and indirectly via a style of coping with stress and stress dynamics ($r = .23, p = .031$). The style of coping with stress and the type of stress dynamic are (partial) mediators of the impact of stress on mental well-being. This means that in a considerable part the dependence between stress and mental well-being may be clarified by the impact of the style of coping with stress and the type

of dynamics. The higher the probability of affiliation to a group reporting a drop in stress (SR), the higher is the self-reported mental well-being. The higher the share of task-oriented coping styles as compared to the emotion and avoidance-oriented styles, the higher is the self-reported mental well-being.

The psychosocial strains and the perception of stress do not have a direct or indirect ($\beta = .09; \beta = .08$) impact on physical well-being.

DISCUSSION

The study shows the impact of the studied variables – psycho-social factors and occupational stress – on the assessment of physical well-being. This agrees with the results of studies presented by the authors of the Psychosocial Work Conditions Questionnaire on linear relations between the studied variables and health and stress (Cieślak & Widerszal-Bazyl, 2000). Psychosocial strains directly affect the assessment of mental well-being. This impact is moderated by stress dynamics, i.e., the mode in which the employees of drilling platforms adapt to the work conditions over 20 years and by the style of coping in difficult situations. The most expressive is the group which, based on the cluster analysis, turns out to be the one in which the employees self-reported a drop in stress,

and this is the group with a direct dependence on the positive evaluation of mental well-being. In two other groups, the one where the stress grew over the years and the one where the level of stress was variable (flexible), no such dependence was recorded.

The psychosocial strains also indirectly affect mental well-being via the styles of coping with stress. This relation is shown in multiple studies, yet of interest are the proposals of individual types of coping styles (task-oriented, emotion, and avoidance-oriented) that are attained by those reporting good adaptation to stress in a longitudinal perspective, shown in the aforementioned studies, describing the relationship between stress and specific physical ailments in detail. It was found in these studies that even though the leading task-oriented style is important, at the same time, the level of emotional coping with stress is also quite high (Leszczyńska et al., 2014).

The study does not show the impact of the studied variables – psychosocial factors and occupational stress assessment – on the assessment of the physical well-being of employees of drilling platforms.

This may be related to various indicators used for the assessment of physical well-being. If the respondents are asked about specific ailments, confirmed by a physician, about the medications that they take, and the dosage, their answers are different when they are asked about assessment of such a state. Such assessment, despite having the traits of objectivity, refers more to the significance or nuisance of such physical ailments through the prism of the performed work and its significance in the life of the respondents (Leszczyńska et al., 2014). In earlier reports about the discussions about the psychological determinants and health consequences of occupational stress at drilling platforms in a longitudinal perspective, the obtained results may be narrowed down to the conclusion that the perception of work as demanding, the necessity of control at work and the feeling of lack of social support, related to the dominant task-oriented style, may contribute to negative health consequences: a greater number of ailments, a higher level of BMI and worse assessment of own health condition. In this paper, the indicator of physical well-being is an assessment that is very subjective and, paradoxically, may be positive, despite the actual occurrence of certain ailments. If the respondents are asked about specific ailments, they answer differently than when they are asked to assess the significance or the negative effects of such ailments.

It is necessary to refer to the subjective character of studies, which is induced by the application of descriptive questionnaires, which is of particular importance in the case of groups working in difficult conditions. This may be related to the high demand for social approval and presentations of a softer – than reality – vision of the experienced stress at the

drilling platform, or it follows from the culturally ascribed role of a strong, hard man who should not admit to feeling stressed. Work at an offshore rig is fully dominated by men. Such a work environment imposes certain models of behaviour related to the stereotypical approach to masculine values. Typically, ‘male’ behaviour is promoted, such as proving strength, not making mistakes, staying calm, and not showing one’s feelings. The studies of Ely and Meyerson (2010) at platforms stationed in the Gulf of Mexico, for the study called ‘Rex’ and ‘Comus’, showed that changes in the organizational structure may induce changes in the behaviour of employees, which consist of the disappearance or termination of promotion of typically ‘male’ behaviour. As a result of the introduced changes, the employees started to share their remarks, problems, or opinions, help one another in physical tasks without feeling ashamed or fearful of ridicule, and acknowledge mistakes at every level, without running the risk of stigmatization. The respondents describe other platforms, where they worked 10 years ago, as a typically ‘male’ environment, where behaviour focused on the presentation of oneself as strong, reliable, and insensitive (Ely & Meyerson, 2010) was promoted at all times.

In the present study the principle of triangulation was applied, and data about the objective assessment of work positions concerning the level of difficulty and nuisance, subjective perception of occupational stress, and health consequences at drilling platforms were used (Leszczyńska et al., 2012). The triangulated and prospective character of studies accommodates the theories that Segestrom and O’Connor (2012) describe in their critical article on occupational stress. The authors believe that studies on stress are multi-level, as many studies on occupational stress are criticised for a static understanding of the process, badly selected research procedures, and the single-level character of tests. The study presented in the paper showed the image of a dynamic and not static image of stress, coping with stress, and the health of individuals from the perspective of work determinants.

Stress and adapting to it is a dynamic process. The assessment of psychosocial strains and evaluation of well-being depends on how the employees adapt to stress over a longer period of time, the values of indicators determining the objective and the subjective feeling of stress, and an assessment of physical and mental well-being depending on several variables.

CONCLUSIONS

1. Psychosocial strains (job demands, control, and support), and dependence between the self-reported occupational stress and mental well-being can be explained by the impact of the style of coping with stress and the type of stress dynamics.

Work strains, well-being and occupational stress of offshore rig workers

The higher the probability of affiliation to the group reporting a decrease in stress, the higher is the self-reported mental well-being. If the style of coping in difficult situations is accounted for, the higher the share of the task-oriented style, as compared with the emotion and avoidance-based style, the higher is the self-reported mental well-being.

2. The employees who report a drop in subjective occupational stress also report better mental well-being. If the range of behaviour types in difficult situations is dominated by the task-oriented style, as compared with the emotion and avoidance-based styles, the self-reported mental well-being of the respondents is better.
3. The work conditions assessed as strenuous and the self-reported subjective occupational stress have a strong impact on mental well-being. If an employee perceives job demands as such that can be handled, is characterized by an average feeling of control at work and a dispositional and dominant task-oriented style of coping with stress, and has a feeling that social support exists, then probably his mental well-being is going to be better.
4. Work conditions do not affect self-reported physical well-being.

LIMITATIONS AND STRENGTHS

Unfortunately, the present study is not without certain limitations or weaknesses. In the first place, it is necessary to indicate the number of respondents and thus advise prudence during the generalization of the study results. All the employees of drilling platforms working in Poland participated in the study. Based on the study of one specific professional group working in special conditions, it is difficult to generalize the results; studies of this type should be performed on other professional groups working in difficult and dangerous conditions. Another factor disrupting the reliability of the received results may be the collection of data using a subjective questionnaire, which may falsify the results, as indicated by most researchers in the offshore extraction industry (Bjerkan, 2010). Suppression or downgrading health problems is likely for fear of losing the job, being moved to onshore work, and, in consequence, a reduced salary.

The problem of optimal operationalization of the main variables explaining stress is still valid and explored. Hence, it is worth indicating the strengths of the study, such as the procedure accounting for longitudinal studies, allowing the dynamic and not the static picture of stress, coping, and individual health to be shown. The performed study also has application assets, e.g., concerning the recruitment for work in difficult conditions and at positions with a particular degree of difficulty (based on work at drilling platforms), determination of the style of cop-

ing in difficult situations is of key importance (Binsh et al., 2021). The task-oriented style is conducive to well-being. In the context of HR management, it is worth remembering that the higher the feeling of job demands, the necessity of controlling what happens at work, and the feeling of low support on the part of colleagues and superiors, the lower is the self-reported mental well-being. Hence, the superiors' care for social support at work seems to be an interesting application conclusion resulting from the performed study.

ETHICAL CONSIDERATIONS

Considering the ethical aspects of the study conducted, it should be pointed out that all subjects consented to participate in the study, and they were informed about the purpose of the study and the possibility of withdrawing from the study at any stage. All survey results were anonymous and confidential – they were not shared in any form, and the completed questionnaires were kept in a secure place. At each stage of the study, employees received feedback on their results, along with recommendations for improving their health, maintaining their mental well-being, and dealing with difficult situations at work.

REFERENCES

- Binsch, O., Bottenheft, C., Landman, A., Roijendijk, L., & Vermetten, E. H. (2021). Testing the applicability of a virtual reality simulation platform for stress training of first responders. *Military Psychology, 33*, 182–196. <https://doi.org/10.1080/08995605.2021.1897494>
- Bjerkan, A. M. (2010). Health, environment, safety culture and climate – analysing the relationships to occupational accidents. *Journal of Risk Research, 13*, 445–477. <https://doi.org/10.1080/13669870903346386>
- Bjerkan, A. M. (2011). Work and health: a comparison between Norwegian onshore and offshore employees. *Work, 40*, 125–142. <https://doi.org/10.3233/WOR-2011-1214>
- Carotenuto, A., Molino I., Fasanaro, A. M., & Amenta, F. (2012). Psychological stress in seafarers: a review. *International Maritime Health, 63*, 188–194.
- Chen, W. Q., Yu, I. T., & Wong, T. W. (2005). Impact of occupational stress and other psychosocial factors on musculoskeletal pain among Chinese offshore oil installation workers. *Occupational and Environmental Medicine, 62*, 251–256. <https://doi.org/10.1136/oem.2004.013680>
- Cieślak, R., & Widerszal-Bazyl, M. (2000). *Psychospołeczne warunki pracy. Podręcznik do kwestionariusza [Psychosocial Work Conditions Questionnaire. Manual]*. CIOP-PIB.

- Cox, T., Griffiths, A., & Rial-Gonzales, E. (2000). *Research on work-related stress*. European Agency of Occupational Safety and Health.
- Dudek, B., Waszkowska, M., & Hanke, W. (1999). *Ochrona zdrowia pracowników przed skutkami stresu zawodowego* [Protection of employees' health against the effects of occupational stress]. Instytut Medycyny Pracy w Łodzi.
- Ely, R., & Meyerson, D. E. (2010). An organizational approach to undoing gender: The unlikely case of offshore oil platforms. *Research in Organizational Behavior*, 30, 3–34. <https://doi.org/10.1016/j.riob.2010.09.002>
- Endler, N. S., & Parker, J. D. (1990). Multidimensional assessment of coping: a critical evaluation. *Journal of Personality and Social Psychology*, 58, 844–854. <https://doi.org/10.1037//0022-3514.58.5.844>
- Heszen, I., & Sęk, H. (2007). *Psychologia zdrowia* [Health psychology]. Wydawnictwo Naukowe PWN.
- Horneland, A. M., Moen, B. E., Holte, K. A., Merkus, S. L., Ellingsen, K. L., Carter, T., Aas, R. W., & Ulven, A. J. (2011). Loss of health certificates among offshore petroleum workers on the Norwegian Continental Shelf 2002–2010. *International Maritime Health*, 62, 266–275.
- Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24, 285–308. <https://doi.org/10.2307/2392498>
- Karasek, R., & Theorell, T. (1990). *Healthy work: Stress, productivity and the reconstruction of working life*. Basic Books.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer.
- Leka S. (2004). Psychosocial hazards and seafarer health: Priorities for research and practice. *International Maritime Health*, 55, 137–153.
- Leszczyńska, I., & Jeżewska, M. (2010). Psychosocial burden among offshore drilling platform employees. *International Maritime Health*, 62, 159–167.
- Leszczyńska, I., Jeżewska, M., & Jeremin, B. (2007). Work-related stress at sea. Possibilities of research and measures of stress. *International Maritime Health*, 58, 93–102.
- Leszczyńska, I., Jeżewska, M., & Grubman, M. (2012). Utility of the triangulation principle in the research of work-related stress among offshore drilling platform employees. In B. Mróz (Ed.), *Functioning in the workplace. Quantitative and qualitative psychological research* (pp. 47–64). Scholar.
- Leszczyńska, I., Jeżewska, M., & Grubman-Nowak, M. (2014). Dynamics of stress as a predictor of health consequences in Polish drilling platform workers. Longitudinal study: part I. *International Maritime Health*, 65, 33–40. <https://doi.org/10.5603/MH.2014.0008>
- Leszczyńska, I. (2016). Psycholog i pracownicy platform wiertniczych [Psychologist and oil rig workers]. In A. Pasztak-Opilka (Ed.), *O prawdziwej pracy psychologa. Spotkania z praktykami* [About the real work of a psychologist. Meetings with practitioners] (pp. 127–157). Difin.
- Morken, T., Mehlum, I. S., & Moen, B. E. (2007). Work-related musculoskeletal disorders in Norway's offshore petroleum industry. *Occupational Medicine*, 57, 112–117. <https://doi.org/10.1093/occmed/kql154>
- Norman, J. N., Ballantine, B. N., Brebner, J. A., Brown, B., Gauld, S. J., Mawdsley, J., Roythorne, C., Valentine, M. J., & Wilcock, S. E. (1988). Medical evacuations from offshore structures. *British Journal of Industrial Medicine*, 45, 619–623. <https://doi.org/10.1136/oem.45.9.619>
- Plopa, M. (1996). *Stres w izolacji morskiej – psychospołeczne uwarunkowania* [Stress in sea isolation – psychosocial determinants]. Wydawnictwo Uniwersytetu Gdańskiego.
- Plopa, M., Makarowski, R., & Plopa, W. (2020). Stress dynamics in long-term isolation at sea. A demographic variables model. *International Maritime Health*, 71, 140–146. <https://doi.org/10.5603/IMH.2020.0024>
- Puchalski, K. (1997). *Zdrowie w świadomości społecznej* [Health in social awareness]. Instytut Medycyny Pracy w Łodzi.
- Segerstrom, S. C., & O'Connor, D. B. (2012). Stress, health and illness: Four challenges for the future. *Psychology & Health*, 27, 128–140. <https://doi.org/10.1080/08870446.2012.659516>
- Strelau, J., & Jaworowska, A. (2020). *CISS – kwestionariusz radzenia sobie w sytuacjach stresowych. Podręcznik do wersji polskiej* [CISS – Coping Inventory for Stressful Situations. Polish version manual]. Pracownia Testów Psychologicznych PTP.
- Wang, F., & Chen, N. (2020). Dynamic response analysis of drill pipe considering horizontal movement of platform during installation of subsea production tree. *Polish Maritime Research*, 27, 22–30. <https://doi.org/10.2478/pomr-2020-0043>