

## Original Article

# The Perceived Stress Levels of Turkish Seafarers Working in the Maritime Sector and Stress-Related Factors

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### Abstract

Seafarers experience stress throughout their working lives. There is a limited amount of research in the literature that examines the perceived stress levels among employees in the maritime sector. From this perspective, conducting a study to evaluate the stress levels of Turkish seafarers would be significant in filling this gap in the literature. Furthermore, it is expected that the results of this research will serve as a guide for stakeholders in the maritime sector, facilitating effective coordination among these institutions. The primary aim of this study was to identify which individual and occupational factors, known to impact on psychological functioning across the maritime industry and other sectors, best predict perceived stress and factors affecting the perception of stress among a sample of Turkish seafarers. 385 seafarers were included in the study. A descriptive information form consisting of a total of 23 questions, including demographic data created as a result of literature review and questions about working conditions, and a Perceived Stress Scale were completed by the participants. The data obtained in the research were analyzed using the SPSS 22.0 statistical software. In the study, the perceived stress levels of seafarers were found to be associated with individual factors such as age, parental status, occupation, and experience in the profession. Additionally, work environmental factors, including the duration of the last contract, type of ship worked on, social environment on the ship, communication with the outside, and perceived mobbing from the affiliated company, were also identified as contributing factors.

**Key Words:** Seafarers, Stress, Perceived Stress, Maritime Sector

### Introduction

The maritime and ship industry has held significant importance throughout history in terms of transportation and trade. Various types of ships, with their diverse functions, have gained considerable significance in human life over time, even if not always fully recognized. In a field of such great importance in life, the sole driving force behind the ability of ships to fulfill their functions is the sector's workforce, who work diligently in this domain (Akcanbas & Uslu, 2022).

The concept of a seafarer, often referred to as "gemi adamı" in Turkish, is a term that encompasses all seafarers on a ship, from the top segment to the lowest segment. In essence, a seafarer refers to individuals working on a ship, typically under specific service contracts and possessing the required qualifications as indicated by their seafarer's credentials (Kouni,

2006). Working on board ships is a hazardous occupation. Seafarers employed on ships spend weeks to months at sea, far from their homes, with limited access to medical facilities, and they are exposed to an elevated risk of diseases and accidents in comparison to the general population (Nittari et al., 2018; Nittari et al., 2022).

According to the World Health Organization (WHO), mental health is defined as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community." This definition underscores that the concept of mental health goes beyond the absence of mental illness, encompassing psychological well-being that enables an individual to lead a fulfilling and peaceful life (WHO, 2004).

Stress is the response developed by an organism to adapt to its environment, which occurs as a result of the interaction between an individual and their surroundings (Akcanbas & Uslu, 2022). While it is often defined as a negative condition, stress, when at an optimal level, can assist a person in maintaining their life, staying alert in the face of events, and staying motivated. Therefore, it is important to keep stress at an optimal level (Aksu, 2016; Akcanbas & Uslu, 2022).

Just like individual stress, moderate levels of stress in the workplace can motivate a person and lead to success, while too little or excessive stress can have adverse consequences. Professions with high levels of risk often see stress levels rise in proportion to the level of risk involved. The stress experienced by an individual in their workplace can negatively impact not only themselves but also the colleagues and the overall work environment (Akcanbas & Uslu, 2022). For seafarers, stress is perhaps one of the few constant factors throughout their working lives. Due to the integration of their living and working areas during voyages, seafarers are consistently on alert and under stress (Akcanbas&Uslu, 2022, Jonglertmontree et al., 2022; Cuvadar Bas & Doymus, 2023).

The maritime sector, the ship itself, the route the ship follows, and the facilities available on board hold significant importance in terms of stress for seafarers working on the ship. This is due to the fact that they are not only required to work on the ship but also to live and sustain themselves there for a specific duration. Given these conditions, the extended periods spent on board can lead to challenging situations for seafarers (Karadag, 2019; Uslu, 2021).

Previous studies have indicated the presence of various risk factors and high levels of stress in the maritime sector. The maritime profession encompasses factors that can induce stress in individuals, such as, isolated living conditions, communication challenges, fatigue, long and irregular working hours, and the handling of potentially hazardous materials, both in terms of communication with the shore and interactions with onboard personnel (Oldenburg et al., 2010; Jegaden et al., 2019; Jensen & Oldenburg, 2021; Li et al., 2022). In addition, international research has identified psychosocial risks associated with issues such as excessive bureaucracy on board, a deficiency in professionalism, management leadership (De La Campa Portela & Pérez, 2016; Jensen &

Oldenburg, 2020; Buscema et al., 2023), mental health disorders, incidents of piracy and harassment on board, inadequate rest periods, automation of machinery, extended working hours, workplace fatigue, and the challenges posed by multiculturalism (Buscema et al., 2023; Cuvadar Bas & Doymus, 2023). It has been noted that, along with these challenging situations, factors such as feelings of loneliness and longing are also influential on the emotional well-being of seafarers, in conjunction with the job-related stress created by the environmental conditions they find themselves in (Karadag, 2019; Lefkowitz et al., 2019; Sarinas et al., 2022; Buscema et al., 2023; Cuvadar Bas & Doymus, 2023).

In the maritime industry, seafarers' human rights and decent working conditions are addressed and safeguarded by the Maritime Labour Convention (MLC) of 2006 (ILO, 2006). The Maritime Labour Convention (MLC) of 2006 establishes the minimum labor and welfare standards for seafarers, making it one of the foundations for assessing seafarers' mental health (MH). However, the MLC 2006 does not explicitly emphasize seafarers as active agents responsible for their own mental health. In other words, its recommendations primarily focus on the need to investigate "special physiological or psychological problems created by the shipboard environment" and "problems arising from physical stress on board a ship." (Melbye & Carter, 2017; Abila et al., 2023). On ship, seafarers reside in the same limited space where they carry out their work duties. This element has an impact on the quality of their relaxation, leisure activities, interpersonal relationships, and their psychophysical health, which, in turn, influences their performance (Buscema et al., 2023; Cuvadar Bas & Doymus, 2023). Studies conducted both Turkish and internationally have identified factors such as low sleep quality, environmental conditions, stressful working environments, frequent port visits, and extended working hours as contributors to fatigue in seafarers. When examining maritime accidents, it becomes evident that a significant portion of these incidents results from human errors, particularly those related to fatigue, carelessness, and stress. This underscores the crucial importance of the human factor in the maritime sector (Carotenuto, 2012; Sliškovíc & Penezíc, 2017; Ozsever & Tavacioglu, 2018).

The examination of psychosocial hazards among seafarers is gaining prominence in the global academic literature (McVeigh et al, 2021;

Buscema et al., 2023). In the literature, it is emphasized that the mental health of seafarers is a serious problem. However, this situation has been neglected or not taken into account enough in the maritime sector. The mental health problems of shipmen have often been considered less important than more concrete problems, such as accidents or physical pathologies. It is crucial for seafarers to operate within a secure environment and adhere to safety regulations (Nittari et al., 2018; Rozanov, 2020; Brooks & Greenberg, 2022; Li et al., 2022; Jonglertmontree et al., 2022; Cuvadar Bas & Doymus, 2023). In a systematic review evaluating the mental status of seafarers, it was explained that only 10.61% of all studies conducted in the field were studies evaluating the mental status of seafarers (McVeigh et al., 2021). In the literature review, it has been observed that there is a limited amount of research conducted on the analysis of the mental health status of Turkish seafarers. From this perspective, conducting a study to evaluate the stress levels of Turkish seafarers would be significant in filling this gap in the literature. In recent times, it has been confirmed through news reports and social media postings, particularly, that incidents such as aggression, suicide, and murder have increased on ships as a result of seafarers' inability to cope with mental health issues. The significance of the mental health of seafarers necessitates conducting studies to prevent and address the problems it poses, thereby employing preventive and coping techniques. From this perspective, it is important to determine the perceived stress levels of Turkish seafarers and the factors influencing stress perception in order to fill the gap in the literature. Furthermore, it is expected that the results of this research will serve as a guide for stakeholders in the maritime sector, facilitating effective coordination among these institutions. In addition, when reviewing the literature, it is evident that there are differences in working conditions between countries, and it is believed that working conditions have an impact on the stress levels of seafarers. Therefore, in contrast to other studies in the literature, the influence of the seafarers' perception of the company they are connected to on their perceived stress levels will also be examined. Therefore, the primary aim of this study was to identify which individual and occupational factors, known to impact on psychological functioning across the maritime industry and other sectors, best predict perceived stress and factors affecting the

perception of stress among a sample of Turkish seafarers.

### **Theoretical Basis and Research Hypotheses**

The constantly evolving labor market, globalization, and technological advancements are continually altering the quality of life for seafarers on board ships. This underscores the increasing demand for training in stress management for seafarers (Li et al., 2022; Abila et al., 2023). Recent research has shown a growing focus on the mental health of seafarers, especially in terms of positioning mental health as an integral component of seafarers' overall well-being (Carotenuto, 2012). A limited number of studies have been found in the literature that examine the stress levels among maritime sector employees. In these studies, it is observed that the sample size is very limited, and the findings cannot be generalized to the entire population. Several studies have indicated the presence of high levels of stress among seafarers, both internationally and within the Turkish context (Jensen & Oldenburg, 2020; Akcanbas & Uslu, 2022; Cuvadar Bas & Doymus, 2023). Factors such as isolated living conditions, communication challenges, long working hours, fatigue, exposure to hazardous materials, and the demanding nature of the maritime profession have been associated with increased stress levels among seafarers (Karadag, 2019; McVeigh et al., 2021; Cuvadar Bas & Doymus, 2023). Furthermore, the unique working environment of seafarers, characterized by extended periods spent away from home, limited access to medical facilities, and the constant pressure of performing duties under potentially hazardous conditions, adds to the likelihood of experiencing high levels of stress (Jonglertmontree et al., 2022; Abila et al., 2023; Cuvadar Bas & Doymus, 2023). Additionally, the integration of living and working areas onboard ships can contribute to a persistent state of alertness and stress among seafarers (Oldenburg et al., 2010). Considering these factors, the hypothesis posits that Turkish seafarers, similar to their counterparts in other regions, experience high levels of perceived stress due to the demanding nature of their profession and the challenging conditions they face while working at sea. This hypothesis aims to guide further research into understanding and addressing the mental health needs of Turkish seafarers and to inform interventions aimed at mitigating stress and promoting well-being within this population.

*H1: The perceived stress levels of Turkish seafarers are high.*

### **Individual Factors**

Studies report that the perceived stress levels of seafarers are high (Doyle et al., 2016; McVeigh & MacLachlan, 2019). In a study, it was revealed that 65% of seafarers experience stress. The study explained that the highest level of mental stress is observed among deck personnel, while those experiencing physical stress are predominantly from the engine department (Oldenburg & Jensen, 2020). Studies report that factors such as age, maritime experience, educational level, marital status, social support, health status, ethnicity affect perceived stress levels (Bergheim et al., 2015; Doyle et al., 2016; McVeigh & MacLachlan, 2019; Oldenburg & Jensen, 2020). Taking all these studies into account, this study proposes the following hypotheses to test the relationship between individual factors and perceived stress:

*H2: The perceived stress levels of seafarers are related to individual factors (age, education level, marital status, parental status, occupation, experience of profession)*

### **Work environmental factors**

Studies conducted show that pressure, time and work stress from the company to which shipmen are affiliated have a negative relationship with job satisfaction levels in seafaring and a positive relationship with intention to quit work. Working times of more than 9 hours per day are associated with stress, psycho-emotional stress and burnout (Jonglertmontree et al., 2022). Studies also show that the part worked on the ship has an effect on stress. Shipman who worked in the deck department of the ship had higher levels of mental stress, while shipman who worked in the machinery department showed higher levels of physical stress. In addition, those in the deck department experienced higher levels of burnout and lower levels of job satisfaction than those in the machinery department (TavacIoglu et al., 2019; Oldenburg & Jensen, 2020). In the studies, the factors related to the stress levels of seafarers were explained as port permits, bad working environment, job difficulties, company pressure, long working hours, working in a multicultural environment, piracy, contracts over 4 months, the ship's physical environment, nutritional problems and social isolation (Bergheim et al., 2015; Doyle et al., 2016; McVeigh & MacLachlan, 2019; Oldenburg & Jensen, 2020). Taking all these studies into

account, this study proposes the following hypotheses to test the relationship between work-environmental factors and perceived stress:

*H3: The perceived stress levels of seafarers are related to work environmental factors.(type of ship, duration of the last contract, social environment on the ship, internet on the ship, nutritional status on the ship, mobbing)*

### **Methods**

**Sample Group of the Research:** In the research, a primarily descriptive and relationship-seeking research model was employed. The number of seafarers in Turkey is announced as 116,250. However, when the seafarers working on foreign flagged ships and not actively working are excluded, this number is explained as 92,775 (TMTI, 2018). The snowball sampling method was used in the research. The selection of the sample for the research was conducted in a known population scenario (92,775 seafarers). The sample size, determined with a 95% confidence level and a 5% margin of error, was set at 383. Participants were invited to participate in the research if they met the inclusion criteria. 385 seafarers were included in the study. But 12 outliers that do not correspond to the normality distribution were traced. The data of these participants were excluded from the study. As a result, the data of 372 participants were included in the analysis. The data has been collected online via Google Forms.

**Measurement Methods:** The researchers have prepared a questionnaire consisting of 23 questions in two sections. The first section is a descriptive information form, which includes demographic data and questions related to working conditions, formed as a result of a literature review (Carotenuto, 2012; McVeigh et al., 2021). The second section is the Perceived Stress Scale. The Perceived Stress Scale (PSS-10) is a tool developed by Cohen et al., in 1983. It is designed to assess the degree to which individuals perceive situations in their lives as stressful. There are several alternate versions of the PSS, and they differ in the number of items used to describe perceived stress. The Turkish validity and reliability study was conducted by Kaya et al., in the year 2019. Each item on the Perceived Stress Scale (PSS-10) is rated on a 5-point Likert-type scale, with response options ranging from 0 (never) to 4 (very often). To calculate the PSS-10 total score, responses are summed over the 10 items, but the scores on four positive items are reversed. 4 of the scale items containing positive expressions are scored

backwards. The total score can range from 0 to 40, with higher scores indicating a higher level of perceived stress. There are two sub-dimensions: perceived self-efficacy and perceived helplessness. In the Turkish validity and reliability study of the scale, the Cronbach Alpha value was found to be 0.84 (Kaya et al., 2019). The Cronbach Alpha value in this study is 0.849.

**Data Analysis:** The data obtained in the research were analyzed using the SPSS 22.0 statistical software. Descriptive characteristics of the participants in the study were determined using frequency and percentage analyses, and for examining the scale, mean and standard deviation statistics were used. Kurtosis (Flatness) and Skewness (Skewness) values were examined to determine whether the research variables followed a normal distribution. A kurtosis value between  $\pm 1.0$  is considered excellent for most psychometric purposes, but a value between  $\pm 2.0$  is in many cases also acceptable, depending on the particular application (George & Mallery, 2010). It has been determined that the variables exhibit a normal distribution. Parametric methods were employed in the data analysis. Independent Samples T-Test was used for examining differences in scale levels between two-variable groups based on the descriptive characteristics

of the employees. One-way analysis of variance (ANOVA) analyses were utilized for groups with three or more variables. In cases where there was a significant difference between groups with three or more variables, the post-hoc analysis was performed using the Tukey LSD test.

**Ethics Committee Permission:** The research obtained ethical approval from the Gedik University Ethics Committee with the reference number E-56365223-050.01.04-2023.137548.26-431. Participants were requested to consent to the voluntary informed consent form. Approval was obtained from the developer of the "Perceived Stress Scale," which was used in the research.

## Results

The findings regarding the descriptive characteristics of the participants are presented below. (Table 1).

The average total scale score of the seafarers is  $19.0403 \pm 5.767$  (Min=2, Max=32). The perceived helplessness sub-dimension has an average scale score of  $11.8247 \pm 4.172$  (Min=0, Max=21), and the perceived self-efficacy sub-dimension has an average scale score of  $7.1156 \pm 2.465$  (Min=0, Max=12) (Table 2).

**Table 1. Descriptive Informations of Seafarers**

Groups	Frequency(n)	Percent(%)
<b>Age</b>		
18-24	78	21.0
25-32	232	62.4
33-40	45	12.1
41 and above	17	4.6
<b>Sex</b>		
Woman	0	0
Man	385	100
<b>Education</b>		
High school and under	31	8.3
Bachelor degree and above	341	91.7
<b>Marital status</b>		
Single	268	72.0
Married	104	28.0
<b>The state of having a child</b>		
Yes	46	12.4
No	326	87.6
<b>Working status on the ship</b>		
Master or Chief engineer	17	4.6

2nd Captain (Chief officer) or 2nd Engineer (1st Assistant Engineer)	111	29.8
3 or 4. Captain or Engineer	154	41.4
Machine crew	26	7.0
Deck trainee or Machine trainee	64	17.2
<b>Time Spent in the Profession</b>		
1-5 year	200	53.8
6-10 year	129	34.7
10 year and above	43	11.6
<b>Type of Ship</b>		
Tanker ship	302	81.2
Dry cargo ship	43	11.6
Container ship	19	5.1
Others	8	2.2
<b>Time spent on board</b>		
1 month and under	97	26.1
2 months	67	18.0
3 months	102	27.4
4 months	22	5.9
4 months above	84	22.6
<b>The condition of the provisions on the ship</b>		
Too Poor	54	14.5
Poor	42	11.3
Middle	114	30.6
Good	162	43.5
<b>The social environment on the ship</b>		
Too Poor	15	4.0
Poor	67	18.0
Middle	144	38.7
Good	146	39.2
<b>The state of communication with the outside world</b>		
Too Poor	38	10.2
Poor	20	5.4
Middle	132	35.5
Good	182	48.9
<b>The state of thinking that the company is practicing mobbing</b>		
Yes	178	47.8
No	194	52.2

Table 2. The Average Scale Score of Seafarers

Scale Score	N	Mean	SD.	Min.	Max.	Kurtosis	Skewness
Scale Total	372	19.0403	5.767	2.00	32.00	0.765	-0.472
Perceived helplessness	372	11.8247	4.172	0.00	21.00	0.950	-0.719
Perceived insufficient self-efficacy	372	7.1156	2.465	0.00	12.00	-0.165	-0.172

SD: Standard deviation; Min: Minimum; Max: Maximum

### Individuals Factors

Statistically significant differences were detected in the scale score averages of seafarers based on their ages ( $p=0.000$ ). The reason for the difference is that seafarers aged between 25-32 and those aged between 18-24 have higher perceived stress levels compared to seafarers aged 33-40 ( $p=0.000$ ). The perceived insufficient self-efficacy subscale scores of seafarers show significant differences according to age ( $p=0.000$ ). The reason for the difference is that seafarers aged between 25-32 have higher scores in the perceived insufficient self-efficacy subscale compared to seafarers aged between 18-24 and 33-40. The perceived helplessness subscale scores of seafarers show significant differences according to age ( $p=0.000$ ). The reason for the difference is that seafarers aged between 25-32 have higher scores in the perceived helplessness subscale compared to seafarers aged between 18-24 and 33-40.

The perceived stress levels of seafarers do not show significant differences based on their educational qualifications ( $p>0.05$ ). Seafarers with a bachelor's degree or higher education level have higher scores in the perceived insufficient self-efficacy subscale compared to those with a high school diploma or lower ( $p<0.05$ ).

No statistically significant difference in scale score averages was found among seafarers based on their marital status ( $p>0.05$ ). However, the perceived insufficient self-efficacy subscale scores of single seafarers were found to be higher than those who are married ( $p<0.05$ ). A statistically significant difference in scale score averages was observed among seafarers based on their parental status ( $p<0.05$ ). Having children significantly reduces the perceived stress levels. Furthermore, the total scores of both sub-dimensions for seafarers without children were found to be higher than those with children ( $p<0.05$ ).

There was a significant difference found in the perceived stress levels among seafarers based on their occupations ( $p=0.000$ ). The reason for the difference is that seafarers working as second engineers and second mates have higher perceived stress levels compared to all other groups, while chief engineers and masters have the lowest perceived stress levels. There was a significant difference found in both sub-dimension scores among seafarers based on their occupations ( $p=0.000$ ).

Statistically significant differences were observed in the scale score averages of seafarers based on the years of experience in the profession ( $p<0.05$ ). The reason for the difference is that those working between 6 to 10 years have the highest perceived stress levels, while those working for more than 10 years have the lowest perceived stress levels. Seafarers' working durations in the maritime profession showed a significant difference in scores for both sub-dimensions ( $p<0.05$ ). The reason for the difference is that seafarers with more than 10 years of experience in the maritime profession have lower scores in sub-dimensions compared to other groups (Table3).

### Work environmental factors

A statistically significant difference in scale score averages was detected among seafarers based on their perception of being subjected to mobbing by their company ( $p=0.000$ ). Believing that mobbing is applied by the company significantly increases the perceived stress levels. Seafarers who believe they are subjected to mobbing by their companies have higher scores in the perceived helplessness sub-dimension compared to those who do not believe they are subjected to mobbing ( $p=0.000$ ).

There is a significant difference in the perceived stress levels among seafarers based on the time spent on the ship ( $p=0.005$ ). The reason for the difference is that seafarers who have been on the ship for 1 month or less have lower perceived stress levels compared to those who have been on the ship for more than 2 months, 3 months, and 4 months. There was no significant difference found in the sub-dimension scores based on the time spent on the ship ( $p>0.05$ ).

Statistically significant differences were found in the scale score averages of seafarers based on the type of ship they work on ( $p=0.000$ ). The reason for the difference is that seafarers working on tanker ships perceive higher levels of stress compared to those on other types of ships. The scores for both sub-dimensions of the scales show a significant difference based on the type of ship worked on ( $p=0.000$ ). The reason for the difference is that seafarers working on tanker ships have higher scores in the perceived inadequate self-efficacy sub-dimension compared to those working on dry cargo and container ships. According to the perceived helplessness subscale, scores of seafarers working on tanker ships are higher

than those of individuals working on container and other types of ships, as well as those working on dry cargo ships.

Statistically significant differences in scale score averages among seafarers could not be detected based on ship provisioning ( $p>0.05$ ). However, there is a significant difference in perceived helplessness sub-dimension scores based on ship provisioning ( $p=0.000$ ). The reason for the difference is that seafarers describing the provisioning situation on the ship as poor and moderate have higher scores than those describing it as good.

Statistically significant differences were found in the scale score averages of seafarers based on how they describe the social environment on the ship ( $p=0.000$ ). The reason for the difference is that seafarers who describe the social environment on the ship as poor have higher perceived stress levels than others. According to the assessment of the social environment on the ship, there is a significant difference in scores for both sub-dimensions among seafarers ( $p=0.000$ ). The reason for the difference is that in the perceived helplessness sub-dimension,

those who describe the social environment on the ship as poor have the highest scores, and in the perceived inadequate self-efficacy sub-dimension, those who describe it as poor and moderate have higher scores than those who describe it as very poor.

Statistically significant differences were observed in the scale score averages of seafarers based on their perception of communication with the outside world and the internet situation on the ship ( $p=0.000$ ). The reason for the difference is that those who describe the internet situation on the ship as moderate have higher perceived stress levels than others. There is a significant difference in scores for both sub-dimensions based on the internet situation on the ship ( $p=0.000$ ). The reason for the difference is that, for the perceived helplessness sub-dimension, those who describe the internet as moderate have higher scores than others, and for the perceived inadequate self-efficacy sub-dimension, those who describe the internet as moderate have higher scores than those who describe it as good (Table 3).

**Table 3. The Scale Score Averages of The Groups**

Descriptive Characteristics	n	PSS Total	Perceived insufficient self-efficacy	Perceived helplessness
		Mean±SD	Mean±SD	Mean±SD
<b>Age</b>		Mean±SD	Mean±SD	Mean±SD
18-24	78	18.4103±5.48773	7.2949±2.05198	11.1154±3.91129
25-32	232	20.0302±5.34716	7.4655±2.34634	12.5647±4.18150
33-40	45	15.6667±6.13114	5.2000±2.37027	10.4667±3.91152
41 and over	17	17.3529±5.96805	6.5882±3.33652	10.7647±2.94808
F=		9.011	12.184	5.384
p=		<b>0.000</b>	<b>0.000</b>	<b>0.001</b>
PostHoc=		1>3, 2>3 ( $p<0.05$ )	2>1, 2>3 ( $p<0.05$ )	2>1, 2>3 ( $p<0.05$ )
<b>Education</b>		Mean±SD	Mean±SD	Mean±SD
High school and lower	31	15.7419±6.57251	6.0000±3.03315	9.7419±3.96626
Bachelor degree and over	341	19.3402±5.50469	7.2170±2.36640	12.1232±4.08038
t=		-3.426	-2.673	-2.673
p=		0.006	<b>0.002</b>	0.137
<b>Marital Status</b>		Mean±SD	Mean±SD	Mean±SD
Single	268	19.0634±5.53231	7.3433±2.37687	11.7201±4.22761
Married	104	18.9808±6.06915	6.5288±2.53885	12.4519±3.79289
t=		0.126	2.909	-1.541
p=		0.900	<b>0.004</b>	0.124



<b>Working status on the ship</b>		Mean±SD	Mean±SD	Mean±SD
Master and Chif Engineer	17	12.0000±6.70820	3.6471±2.57248	8.3529±4.22701
2nd Captain and Engineer	111	21.2883±3.41757	7.4775±1.69409	13.8108±2.21775
3 and 4. Captain and Engineer	154	18.8701±5.98986	7.1039±2.40688	11.7662±4.61001
Machine Crew	26	16.1538±5.78060	5.9615±2.82107	10.1923±3.42951
Trainee	64	18.5938±5.63357	7.9063±2.58640	10.6875±4.23468
F=		14.545	13.975	13.200
p=		<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
PostHoc=		2>1, 3>1, 5>1, 2>3, 2>4, 2>5 (p<0.05)	2>1, 2>4, 3>1, 3>4, 5>4 (p<0.05)	2>1, 3>1, 2>3, 2>4, 2>5 (p<0.05)
<b>The state of having a child</b>		Mean±SD	Mean±SD	Mean±SD
Yes	46	14.4130±6.07573	4.7826±2.20524	9.6304±3.61084
No	326	19.6933±5.31509	7.4448±2.20524	12.2485±4.08783
t=		-6.193	-7.389	-4.122
p=		<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
<b>The state of thinking that the company is practicing mobbing</b>		Mean±SD	Mean±SD	Mean±SD
Yes	178	20.7022±4.42848	7.1404±2.05502	13.5618±2.79408
No	194	17.5155±6.25555	7.0928±2.76388	10.4227±4.55100
t=		5.625	0.187	7.932
p=		<b>0.000</b>	0.851	<b>0.000</b>
<b>Time Spent in the Profession</b>		Mean±SD	Mean±SD	Mean±SD
1-5 years	200	19.3500±5.76312	7.5700±2.44643	11.7800±4.53369
6-10 years	129	20.0698±4.49511	7.1008±1.86600	12.9690±3.04122
10 years over	43	14.5116±6.42307	5.0465±2.92732	9.4651±3.82566
F=		17.520	20.830	12.689
p=		<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
PostHoc=		1>3, 2>3 (p<0.05)	1>3, 2>3 (p<0.05)	1>3, 2>3, 2>1 (p<0.05)
<b>Time Spent in the Ship</b>		Mean±SD	Mean±SD	Mean±SD
1 month and under	97	17.4433±6.08271	6.7216±2.93237	10.7216±4.12245
2 months	67	19.4030±5.23120	7.0597±2.06618	12.3433±4.12146
3 months	102	20.3235±5.32166	7.6176±2.12968	12.7059±3.95917
4 months	22	17.6364±5.65303	6.5455±2.80692	11.0909±3.32249
4 months over	84	19.4048±5.67930	7.1548±2.31024	12.2500±4.23376
F=		3.823	2.037	3,615
p=		<b>0.005</b>	0.089	0.007
PostHoc=		3>1, 5>1, 2>1, 3>4 (p=0.05)		

<b>The condition of the provisions on the ship</b>		Mean±SD	Mean±SD	Mean±SD
Too Poor	54	47,595±7.73540	6.8704±2.51070	11.5741±5.60189
Poor	42	51,166±4.60148	7.8810±2.01461	12.8571±2.96789
Middle	114	19.9912±5.08250	6.9561±2.44004	13.0351±3.50961
Good	162	18.1296±5.36279	7.1111±2.51455	11.0185±3.98829
F=		3.998	1.721	6.500
p=		0.008	0.162	<b>0.000</b>
PostHoc=				3>4, 2>4 (p<0.05)
<b>The social environment on the ship</b>		Mean±SD	Mean±SD	Mean±SD
Too Poor	15	12.1333±8.94321	5.3333±1.95180	6.8000±7.06298
Poor	67	21.5075±4.66246	7.5373±2.46999	13.9701±2.63410
Middle	144	20.0764±4.47382	7.4444±1.90244	12.6319±3.15286
Good	146	17.5959±5.85288	6.7808±2.82475	10.8151±4.38651
F=		18.696	5.268	21.162
p=		<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
PostHoc=		2>3, 2>4, 3>4, 2>1 (p<0.05)	2>1, 3>1 (p<0.05)	2>1, 3>1, 2>4, 3>4 (p<0.05)
<b>The state of communication with the outside world</b>		Mean±SD	Mean±SD	Mean±SD
Too Poor	38	17.9211±4.99936	7.5789±2.22555	10.3421±4.68624
Poor	20	17.8000±8.72142	7.0000±2.93795	10.8000±6.02276
Middle	132	21.2955±5.77932	7.8333±2.37084	13.4621±3.82520
Good	182	17.7747±4.80548	6.5110±2.34518	11.2637±3.61347
F=		11.690	8.434	10.862
p=		<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
PostHoc=		3>4, 3>2, 3>1 (p<0.05)	3>4 (p<0.05)	3>4, 3>2, 3>1 (p<0.05)

F: Analysis of Variance Test (ANOVA), t: Independent Samples T-Test, PostHoc: Tukey, LSD

## Discussion

In this study, the average total score of the perceived stress scale for seafarers was found to be 19.0403. According to the evaluation criteria of the 5-point Likert scale, it is observed that the perceived stress levels of seafarers are low. In this study, the average perceived helplessness score on the perceived stress scale for seafarers was found to be 11.8247. According to the evaluation criteria of the 5-point Likert scale, it is observed that the perceived helplessness scores of seafarers are mid-level. In this study, the average perceived self-efficacy score on the perceived stress scale for seafarers was found to be 7.1156. According to the evaluation criteria of the 5-point Likert scale, it is observed that the

perceived self-efficacy scores of seafarers are low. In a study in which the determinants of perceived stress and job satisfaction were investigated in the sample of commercial seafarers using structural equation modeling, it was found that the perceived stress levels of the seafarers participating in the study were low (McVeigh & MacLachlan, 2019). While this is what was obtained as a result of this study, these were found otherwise in many studies. For example; in a study investigating the well-being, resilience, stress perceptions, and experiences of seafarers, a moderate level of stress has been identified (McVeigh et al, 2021). In a cross-sectional study that examined the relationship between social support and quality of life related to health among seafarers, it was reported that

psychosocial stress has a negative impact on overall health, and the need to assess the stress levels of seafarers was emphasized (Xiao et al., 2017). In a study that identified occupational risk factors among seafarers, it was noted that there are various risk factors in the maritime industry and that high levels of stress are observed (Oldenburg et al., 2010). In two studies that investigated the perceived stress of seafarers related to the physical and mental working environment, it was shown that 65% of the total participants had a high level of perceived stress (Oldenburg & Jensen, 2019; Oldenburg & Jensen, 2020). In this study, the low perceived stress levels among seafarers have been attributed to the fact that some variables considered as stress risk factors have not been identified by the participating seafarers. Many seafarers have evaluated conditions such as internet access, provisions, and social environment on the ship as favorable.

### Individuals Factors

In this study, the stress levels of seafarers vary significantly based on the age variable. The highest stress levels have been observed among seafarers aged 25-32. The studies indicate a positive relationship between stress levels and burnout (Karadag, 2019; Akcanbas & Uslu, 2022). In a study assessing the burnout levels of seafarers, similar to this study, the highest burnout levels were observed among seafarers aged 25-29 (Zorba, 2016). When examined by age in another study, as reported, those in the 25-29 age group experienced high levels of emotional burnout (Wu et al., 2017). In studies, it was explained that the age of seafarers had an effect on their stress levels and mental well-being (Rydstedt & Lundh, 2012; Panganiban & Garcia, 2017; Brooks & Greenberg, 2022). Studies indicated that younger personnel exhibit significantly higher levels of self-directed violence, depression, stress, and job-related burnout than older personnel. At the same time, it is observed that psychological capital significantly increases with age (Doyle et al., 2016; Zorba, 2016). However, in another study, no relationship was found between age and well-being (Jo & Koh, 2021). In a study examining the stress levels of seafarers, it was observed that the age factor did not have a significant impact on stress levels (Jensen & Oldenburg, 2021).

In this study, it has been concluded that the level of education does not affect the perceived stress levels. In a study conducted in Turkey, it was explained that the education levels of seafarers

did not affect their stress levels (Karadag, 2019). The finding of this study is contrary to the expected direction. The fact that groups with high professional responsibilities, such as the 2nd Engineer and 2nd Captain on board, have the highest perceived stress levels has created an expectation that the perceived stress level would increase with higher education levels. In contrast to the study, it has been explained that ship officers working in high positions have higher stress levels associated with cultural differences in stress perception and seafarer preparedness (Jensen & Oldenburg, 2021). In another study, it is believed that employees with a higher level of education experience more burnout due to taking on more responsibilities, indicating that as the education level increases, there is also an inclination for increased stress and burnout (Ari & Bal, 2018).

This study found no statistically significant difference in scale score averages among seafarers based on their marital status. Similar to this study, a study conducted in Turkey explained that marital status did not have an impact on stress levels (Karadag, 2019). In another study, marital status was included among the factors contributing to stress and fatigue in seafarers (Panganiban & Garcia, 2017). A qualitative study has been conducted that associates seafarers' occupational stress with personal factors, including marital status (Ali et al., 2023). In another study conducted in Turkey, seafarers' levels of burnout and the factors influencing them were examined, and the findings showed that unmarried seafarers had higher levels of burnout than those who were married (Zorba, 2016). An investigation into the relationship between perceived stress and anxiety levels among seafarers and the quality of emotional bonds manifested as marital satisfaction revealed a connection. In the study, it was explained that there is a relationship between marital satisfaction and perceived stress among seafarers, and marital satisfaction functions as a stress buffer (Peplinska et al., 2013).

The divergence of the study's findings from the literature is attributed to the fact that 72% of the participants were single. In a study examining the stress and burnout levels of seafarers, similar to this study, it was concluded that marital status does not have an impact on stress and burnout, but having children reduces stress and burnout levels (Karadag, 2019). In another study, it was explained that seafarers showed a significant difference in the control dimension of the

Organizational Stress Scale based on the variable of having children (McVeigh & MacLachlan, 2019). In qualitative research conducted on the psychosocial risks of seafarers in Southern Italy, participants expressed in the interview about psychosocial risk factors causing stress on board, saying, "not being able to see my children grow up." (Buscema et al., 2023) Those married ones and have children tend to be bothered by the thoughts of their family and being away from them and missing the most critical events in their lives. Married individuals with children often find themselves troubled by the idea of being separated from their families and missing out on significant events in their lives. As a result, these thoughts may affect their emotions and lead to stress (Panganiban & Garcia, 2017).

In this study, it was observed that among seafarers, those working as 2nd Engineers and 2nd Mates had the highest levels of perceived stress. In a study similar to this one, which examined the psychological factors contributing to stress and fatigue among seafarers, it was demonstrated that the stress and fatigue perceived by seafarers depend on various factors, including their occupational category or rank (Panganiban & Garcia, 2017). In a study, in the context of ship management, the most common causes of psychophysical stress among seafarers are the perception of high responsibility and extensive administrative tasks (Jensen & Oldenburg, 2021). Given the high level of responsibilities for 2nd engineers and 2nd mates, this finding in the study is in line with expectations. In another study, it was reported that captains, first mates, and engineers had lower work pressures than others and experienced lower stress levels. This situation is explained by the fact that these positions involve significant responsibilities, require the ability to make decisive decisions, and it is suggested that taking on these responsibilities, being involved in organizational tasks, and making decisions could be a psychological advantage (Carotenuto, 2012).

In this study, the group of seafarers working as maritime professionals for over 10 years has the lowest perceived stress levels. In a study examining burnout among seafarers, it was observed that those with 1-5 years of experience also experienced high levels of burnout. It is believed that the period with high challenges in adapting to the challenges of maritime life has an impact on burnout during this time. Those working in the 6-10 year range experienced

moderate levels of burnout (Zorba, 2016). In another study, working in the maritime industry for 10 years or fewer has been reported as a stress factor (Zamora et al., 2021).

### **Work environmental factors**

In this study, the findings showed that among seafarers, those who believed they were subjected to mobbing by their companies had higher levels of stress. In a planned study to assess seafarers' perception of mobbing, when seafarers were examined based on the sizes of the companies they worked for, the findings showed that the average mobbing behaviors was higher in companies that could be considered smaller than other companies (Gundogan, 2017).

In a study investigating the perception of mobbing in the maritime industry, it was found that particularly ship personnel in higher positions exhibited higher levels of mobbing (Zorba, 2016). In a study examining the mental health of seafarers, the support provided by the company was precious and was perceived as such by seafarers (Abila et al., 2023). In a study that provides recommendations for improving the mental well-being of seafarers, factors related to the company, such as mobbing, authoritarian hierarchy, security issues, and port inspections, have been reported as psychosocial risk factors for stress. In the same study, it was also reported that the absence of union protection for seafarers is another risk factor (Buscema et al., 2023).

In this study, seafarers who spent the highest duration on the ship, specifically those on board for 3 months, had the highest perceived stress levels. On the other hand, those with the lowest perceived stress levels were individuals who had been on board for fewer than one month. In a study examining factors affecting the mental health of seafarers, it was explained that extended periods of maritime service could lead to mental health issues (Jonglertmontree et al., 2022). According to studies by Oldenburg and Jensen, participants have expressed feeling that the average duration spent on the ship is excessively long and have stated that short-term ship stays could improve working and living conditions (Oldenburg & Jensen, 2019; Oldenburg & Jensen, 2020). Perceived stress may also be influenced by the duration at sea as emphasized by Sliskovic and Penezic (2017), some of the most frequently used psychosocial stressors experienced by seafarers include prolonged separation from family and social

isolation on board (Sliškovíc&Penezíc, 2017). However, there are also studies that explain the absence of a relationship between the duration at sea and perceived stress (Doyle et al., 2016; Brooks & Greenberg, 2022;).

In this study, when perceived stress based on ship type was examined, the findings showed that seafarers working on tanker ships had higher stress levels. In a study, it has been concluded that seafarers working on tanker ships experience higher levels of burnout compared to seafarers working on dry cargo and container ships (Oldenburg et al., 2013). In a study examining the factors that contribute to stress and fatigue among Filipino seafarers, it was observed that seafarers working on tanker ships had higher stress levels than those working on dry cargo ships. However, it was explained that seafarers on tanker ships preferred working on tankers because they received approximately 1.5 times higher salaries (Panganiban & Garcia,2017). In a study conducted in Turkey, it was reported that burnout was the highest among seafarers working on petroleum tanker ships (Aydin, 2015). This finding in the study was explained by the higher level of responsibilities of seafarers working on tanker ships. Their higher responsibilities and increased workload lead to higher salaries compared to seafarers on other types of ships. As responsibility increases, stress levels also tend to increase. In contrast, in a few studies, it was explained that the shorter contract terms for seafarers working on tankers could be considered an advantage, given that the time spent in the maritime working environment, which is thought to potentially increase seafarers' stress levels, is shorter on tanker ships compared to other ship types (Leszczyńska, 2008; Kinali et al., 2022).

In this study, no significant difference was found between the nutritional status on the ship and the perceived stress levels. This situation is associated with the fact that very few of the participating seafarers evaluated the provision status on the ship as poor or very poor. In contrast to this situation, in many studies evaluating stress determinants among seafarers, poor nutrition has been explained as a stress factor (WHO, 2004; Sliškovíc & Penezíc, 2017; Kaba, 2019; Abila & Acejo, 2021). In a study that investigated the psychosocial risks of seafarers in Southern Italy, it was reported that low food quality increased stress levels (Aksu, 2016). Poor nutrition may induce stress by directly stimulating sympathetic nervous system

responses or by increasing fatigue and neural sensitivity (Kum & Bosnak, 2016). The physical and mental demands on seafarers are substantial, as they must contend with many challenges, including the high stress levels they experience on board. The working conditions for seafarers are generally more demanding than those of other occupational groups. Especially for seafarers who work and live on the ship 24/7 in specific periods, meeting their basic needs, such as accommodation and nutrition, is of utmost importance (Jensen & Oldenburg, 2019).

In this study, the seafarers who perceived the highest stress levels were those who described the social environment on the ship as impoverished. In a study evaluating fatigue and stress determinants among Filipino seafarers, it was explained that a lack of social support from colleagues at the workplace increased stress levels (Panganiban & Garcia,2017). In a study investigating the potentially traumatic experiences of seafarers, it was reported that the social environment on the ship impacts the mental well-being of the seafarers (Dohrmann & Leppin, 2017). In another study, factors causing psychological distress in seafarers were examined, and it was explained that the social aspects of life on board have a negative impact on mental health (Sampson & Ellis, 2021). In a study examining the psychosocial risks of seafarers in Southern Italy, it was reported that factors, such as coping with the activities of colleagues and the cultural diversity on board were influencing factors on stress levels (Buscema et al., 2023). The social opportunities or constraints do not vary for any seafarer working on board a ship. This situation may perhaps indicate a unique condition that is inherent to the nature of maritime work, which is unlike other occupational groups (Zorba, 2016). Working in a multicultural environment can particularly lead to a poor social atmosphere for seafarers. Language barriers may result in a lack of social support among seafarers (Nittari et al., 2018).

In this study, the seafarers with the lowest perceived stress levels are those who indicated that communication on board is at a moderate level. The reason for this is that there are fewer participants who described the internet situation on board as good and very good than those who rated it as poor and very poor. In a study examining changes in seafarers' working conditions over time, in 2011, regardless of the type of ship, most ships did not have internet access. However, by 2016, internet usage

became more widespread on all ship types except bulk carriers (Sampson & Ellis, 2021). The type of ship also affects internet access as most seafarers in this study work on tanker and dry cargo ships. In a study investigating the importance of information and communication technologies in improving the mental health of seafarers, it was explained that they require efficient, high-quality, and affordable internet connectivity to be able to communicate with their families and emphasized its significance (Abila et al., 2023). Similarly, in the Oldenburg et al. study, it was noted that difficulties in communication with the shore increase the stress levels of seafarers (Oldenburg et al., 2010). In a study that examined the relationship between social support, health, and quality of life among Chinese seafarers, it was reported that internet and communication issues increased the stress levels of seafarers (Xiao et al., 2017). At sea, crew members can become isolated from the outside world for extended periods, relying on limited communication with their families. This isolation may lead to weak social support and, as a result, an increase in perceived stress levels.

**Study Limitations:** This study included 385 seafarers, and its findings cannot be generalized to the entire population. It is necessary to conduct the study with a larger number of participants. The participation of masters and chief engineers in the study is insufficient. Additionally, the majority of the participants in the study consist of young and unmarried seafarers. The majority of the seafarers who participated in the study typically work on tanker vessels. To evaluate perceived stress levels based on vessel type, seafarers from other types of vessels should also be included in the study in an equal proportion. The study should also encompass variables such as working in a multicultural environment, mobbing on board, hierarchy, piracy, port inspections, and long and shift work situations, which are believed to influence the mental well-being of seafarers. These findings serve as just a preliminary study, laying the foundation for future research that will analyze the role of psychosocial risk factors among seafarers.

**Conclusion;** There are physical, emotional, environmental and psychological factors that contribute to the perceived level of stress among seafarers. The job-related stressors reported by participants are particularly related to perceived mobbing by the shore-based company, social isolation, and poor nutrition. Reducing

seafarers' perceived stress levels requires both individual and organizational measures to be taken. Conducting mental and emotional well-being risk assessments for seafarers and incorporating preparatory training on stress experienced on board into maritime education curricula are crucial steps to take. A guide should be created to reduce seafarers' perceived stress levels by planning a study that includes a greater number of stress factors. It is of great importance for all maritime companies, educational institutions, authorities, and stakeholders in the maritime sector to consider the subject, develop preventive methods, and implement them to ensure the sustainability of the profession.

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