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Seafarers' Job Stress and Subjective Well-Being: The Mediating Effect of Psychological Resilience and the Moderating Effect of Organizational Support

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Abstract

Subjective well-being (SWB) has been widely reported to have a pivotal impact on the individual, yet its application in the marine professions remains unexplored. Thus, in the current work, proposing seafarers' psychological resilience (PR) as a mediator and organizational support (OS) as a moderator, the connection between job stress (JS) and SWB was explored. A survey of seafarers from sailing on merchant ships operating internationally were analyzed with partial least squares structural equation modelling methods. The findings indicate a complete mediation effect of PR on the relationship between JS and SWB. However, the results do not provide any empirical evidence regarding the contingency of OS on the relationship between PR and SWB. This study contributes to the existing literature as it examines the role of individual, organizational, and job elements in a more detailed model of SWB. Knowledge about such elements would highlight challenging areas within seafaring and thereby enable to work out prevention and intervention strategies to improve and develop well-being at sea.

Key words: Seafarers, Subjective Well-Being, Organizational Support, Psychological Resilience, Job Stress

JEL Code: L20, M12

1. Introduction

Understanding SWB has historically been a central human effort and lately emerged as a serious challenge in organizations because it can affect employees' absenteeism, performance, productivity, and turnover (Di Castro et al., 2018; Wang and Yang, 2016; Oswald et al., 2015). Although, how to maintain and promote SWB in the workplace is crucial for all profession, to strengthen the feelings of SWB among seafarers is even more important owing to circumstances particular to life on a ship. Seafarers live an isolated life on board for months away from their families and society which makes seafaring a highly stressful

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occupation. A series of international conventions and regulations have been introduced by ILO's Maritime Labor Convention ***(MLC, 2006)*** to improve mental and physical health issues produced by the shipboard environment. Yet, seafarers suffer from excessive workload, inadequate rest, high stress, and depression. In addition, relative to other areas of employment, seafarers subject to stressors frequently linked to burnout and fatigue which may raise the risk of injuries and accidents at work (Allen et al., 2008; Smith et al., 2007; Uğurlu et al., 2017). All these profession related stressors peculiar to seafarers increases the presence of negative effects and jointly impair SWB.

Organizational support is an important source of social exchange that happens between an organization and its employees. It can contribute to an employee's feeling of self-worth that stimulates favorable sensations about their social environment, and their capability to cope with life's challenges (Davey et al., 2003; Rhoades and Eisenberger, 2002). Besides, it may increase a sense of being valued and appreciated which builds psychological attachment to the employing organization and provides a sense of belongingness and security needed to respond adverse changes at the workplace that creates JS.

However, as an external resource, the flourishing role of OS on wellbeing may be affected by some internal factors. With the rise of positive psychology, PR has emerged as a valuable internal resource for favorable work behaviors and improved occupational health outcomes. Although the positive effects of OS and PR on employees' feeling of wellbeing have been confirmed, to the best of authors' knowledge, among seafarers, the role of OS and PR in boosting SWB have not been investigated. In addition to direct relationship, the study also tests if PR will mediate the relationship between JS and SWB. For the proper analysis of SWB, OS is included in the model as a moderator. Briefly, the present work aimed to explore alternative relationships among OS, PR, JS and SWB among seafarers.

2. Literature Review

2.1 Job Stress and Subjective Well Being

SWB refers to good mental states, including both positive and negative evaluations that people make of their lives (OECD, 2017). It covers two separate but related constructs, cognitive evaluations (perceived happiness and life satisfaction) and hedonic balance (overall equilibrium between positive and negative affects) (Diener et al., 1999). There is no doubt that one key influencer of SWB is workplace. Especially people with nautical occupations, who work 7/24 in certain periods (mostly 3/6/10 months) and the ship is their second home, require high consideration of work-related SWB.

A large amount of literature supports that SWB plays a significant role in maintaining physical and mental health, and can decrease the emergence of

depressive symptoms, burnout, fatigue, and suicidal tendency, all of which are frequently linked to seafaring profession. Being away from home and family and the poor working and living conditions have generally been assumed to impair general health and thus increase suicide rate of seafarers (Mellbye and Carter, 2017; Oldenburg et al., 2016). Due to its relationship with positive psychological factors like hope, optimism, and happiness, SWB can relieve psychological stress and depressive symptoms related directly to occupational conditions and may decrease such detrimental outcomes. Rather than a contributing factor to negative subjective well-being, workplace elements can be organized by employers that decreases stress and thus promote maritime employees' SWB.

The transactional model proposes that stress emerges when internal or external demands are exceeding individuals' ability to manage and endangering their well-being (Folkman and Moskowitz, 2000). Compared to other jobs, seafaring is a challenging and hazardous profession worldwide and associated with higher level of mental, psychosocial, and physical stressors (Comperatore et al., 2005; Salyga and Juozulynas, 2006; Chung et al., 2017). Job-related stressors are frequently imputable to long working hours, shift work and watch keeping, high job demands, external work controls, hectic pace, limited scope for decision-making and strong hierarchical structures (Oldenburg et al., 2010; Hystad et al., 2013). Morover, both during work hours and during leisure time, job-related physical elements on vessels including noise, temperature, vibration, and ship motion increase seafarers' stress, (Allen et al., 2008; Comperatore et al., 2005). Further, they specifically are confronted with serious accidents, ship-wreck, deaths and suicides on board, stowaway and pirate attacks which are extremely stressful situations (Mellbye and Carter 2017; Jensen and Oldenburg, 2019). Multinational and multicultural arrangement on board are also uneasy for the whole team (Alfiani, 2010; Galešić and Coslovich, 2019). The presence of high level of stress may result in low sense of control over the environment, self-esteem, and optimism about the future which in turn may affect wellbeing. So, this leads to the following hypothesis:

H1: JS negatively affects seafarers' SWB.

2.2 Psychological Resilience as a Mediator between Job Stress and Subjective Well-Being

In general, resilience describes human beings' capacity to "bounce back" after a threatening, adverse or challenging period (Masten and Reed, 2002; Luthans, 2003). It is the capacity of an individual to maintain various facets of positive psychological serving in the face of challenging circumstances or transitions (Ryff and Singer, 2003). However, limiting the concept to just a reactive ability that is manifested in hard situations would be wrong because it involves a healthier state that enables growth, flourishing, and improvement (Luthans and Youssef, 2004). Rather than viewing resilience as a unique

individual trait, conceptualizing it as a learnable capacity that can be strengthened and cultivated through training interventions is emphasized in the literature (Bonanno, 2005; Youssef and Luthans, 2007). Extending this approach to the workplace, this study considers resilience as an improbable competence of the employee and suggests that PR not only may directly increase the level of SWB but also may act as a mediator in the association between JS and SWB.

With the rise of positive psychology, employers and leaders recognize the importance of exploring the advantageous qualities of people, including happiness, wellbeing, optimism, resilience, self-esteem, self-efficacy, and hope (Bandura and Locke, 2003; Luthans and Youssef, 2004). Therefore, how to activate or flourish these power and forces in human beings and to take advantage of the positivity approach in the workplace gained considerable interest (Luthans et al., 2006; Reivich and Shatte, 2002). In support of such a perspective, as one of the four pillars of positive psychological resource capacities (hope, efficacy, and optimism), PR is addressed by many researchers as a critical factor especially when working in an unstable and demanding organizational environment such as a shipping industry (Ryff and Singer, 2003; Sutcliffe and Vogus, 2003).

In the relevant literature it is debated that individuals suffer from stress when they consider they lack the resources to overcome tough incidents (Bandura, 2008). Accordingly, PR may act as a advantageous resistance source for reframing the stress, and minimize the undesirable symptoms. Although the relationship between PR and JS has received little attentiveness, there is some evidence that resilient employees are better equipped to cope with the stressors and indicate more emotional healing when faced with adversity (Ong et al., 2006; Schetter and Dolbier, 2011; Tugade and Fredrickson, 2004). These findings may suggest that seafarers with high levels of PR will not easily perceive a challenging task as a stressor because of a positive belief that they can deal with the demand (Lazarus, 2003). This reasoning produced the below hypotheses.

H2: JS negatively affects seafarers' PR.
H3: The PR level of seafarers positively affects their SWB.
H4: PR plays a mediating role in the relationship between seafarers' JS and SWB.

2.3 Organizational Support as a Moderator

OS is defined as employees' common thoughts regarding the extent to which the organization cares about their welfare and values their contributions. Supervisory support, rewards, fairness, and favorable work conditions are associated with OS in meta-analysis (see Rhoades and Eisenberger, 2002). The more autonomy, flexibility, and participation a company provides, the more likely its employees perceive OS. Establishing a supportive environment is also a valuable tool to fulfil employees' socio-emotional needs for esteem, recognition, and emotional support (Kurtessis et al., 2017). Furthermore, OS have been found

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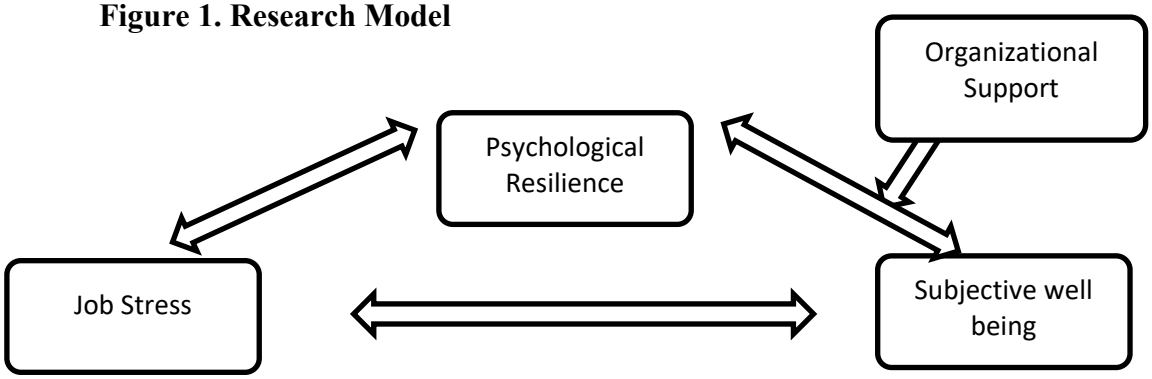
to improve the negative impacts of work–family conflict on well-being (Frye and Breaugh, 2004; O'Driscoll et al., 2003).

Although, in the relevant literature OS is proved to have benefits both for the employee and the organization, relatively few studies have explored the links between OS and SWB in maritime sector that have conditions. While there is many researchers argue that OS or PR reduces the negative effects of JS on various work-related outcomes by encouraging employees cope with the stress, the possible moderation effect of OS on SWB have not examined. Positive impact of PR which act as a type of coping mechanism to increase feeling of well-being may be increased as the vulnerability of feeling isolated is replaced by the strength of a sense of belonging through OS.

H5: OS will moderate the positive relationship between PR and SWB in such a way that the positive relationships will be stronger when OS is high rather than low.

The hypothesized relationships among JS, PR, OS, and SWB are presented graphically in Figure 1. The proposed direct, indirect, and conditional relationships are tested in the following section.

Figure 1. Research Model



3. Methodology

3.1 Sampling and Data Collection

104 Turkish seafarers have participated in the survey which was designed on Google Forms. Most of the participants are male (94.2%), between the ages of 36-45, (54.8%), graduated from university (50.5%), and have sea service time more than 10 years (55.8%). 71,1 % of the respondents work on deck department, 16,4 % work on engine department, and 12,5 % work on the catering department. Lastly, most of the respondents worked on dry cargo ships (23,1%), followed by bulk cargo ships (22.1%) and tankers (19.2%).

3.2 Measures

To test the above-mentioned hypotheses, multi-item scales are adopted from prior studies for the measurement of variables. Each variable was measured using a 5-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5).

To measure JS of seafarers *six-items* scale *developed* by Fairbrother & Warn (2003) were used (Cronbach Alpha= 0.68). As a result of the confirmatory factor analysis (CFA), the item *" There is insufficient shore-staff support at work ",* which had a low factor load was excluded.

SWB was assessed by using a five-item scale (Cronbach Alpha= 0. 83) from Diener et. al. (1985). A sample item is *"My living conditions are quite good".*

The brief version of the six-item PR scale (Cronbach Alpha= 0. 80) previously developed by Smith et. al. (2008). As a result of the confirmatory factor analysis *(CFA), the item "I have a hard time making it through stressful events (R)",* which had a low factor load were excluded.

OS was assessed by using a eight-item scale (Cronbach Alpha= 0.89) from *Eisenberger et. al. (1972).* Presumably, for practical reasons in most of the studies scholars used shorter forms of the on OS survey (e.g. 17-items, 8-items, and 3-items). As a result of the CFA the item "*If given the opportunity, my organization would take advantage of me*" which had a low factor load was excluded.

3.3 Analysis

The partial least squares (PLS-SEM) approach was used to test the developed model as it functions under a limited number of data and overcomes the difficulty of determining the relationships arising from latent variables. Technically, SEM is used to estimate unknown parameters in the linear structure equation set. Building a model in SEM also means the detailed explanation of all the parameters of the relationships between the variables in the model. Variables in equations are usually directly observed variables and latent variables associated with observed variables. It is assumed that there is a causal structure between the set of latent variables and that latent variables can be measured through observed variables.

3.4 Measurement validation

In line with *Kleijnen et. al. (2007),* reflective measurement model in which indicators are considered to be a reflection of their latent variables is applied for all constructs of the study. Cronbach alpha, Composite scale reliability (CR) and

average variance extracted (AVE) is used to determine reliability. AVE value of 0.50 and higher indicates a satisfactory rating of convergent validity. Also, both CR values and Cronbach alpha values, of 0.60 to 0.70 are regarded as satisfactory. To fulfill discriminant validity, AVE for each construct should be higher than the square of the scale score correlation. It was seen that the AVE value for all factors had a higher value than the correlation square. In this respect, the model also complies with discriminant validity criteria. (Table 1). Moreover, all measures standardized loadings' is higher than 0.60 (Appendix A).

Table 1. Correlations and Descriptive Statistics

	Variables	1	2	3	4
1	JS	0,711			
2	SWB		0,778		
3	PR			0,742	
4	OS				0,783
	CR	0,801	0,882	0,859	0,916
	AVE	0,506	0,605	0,551	0,613

4. Hypotheses Testing

To calculate the interaction and indirect effects in addition to the main influences, to test the predictive power of our propound model and the hypothesis, The PLS and the bootstrapping method were operated via SmartPLS 3.0 software program (Figure 1). The bootstrap procedure is a resampling technique used to evaluate statistics on a population by sampling a dataset with substitution and can be used to test the significance of a structural path using T-Statistic. The path coefficients and their jointed *t-values* show the way and impact of each hypothesized connection. Following *Chin and colleagues' (2003),* a hierarchical style that is a model both the main impacts (and covariates) and the indirect (mediation) impacts was calculated, after the interaction impacts were added.

Utilizing the bootstrapping procedures of SmartPLS, mediation tests were carried by analyzing the significance of the indirect paths that are derived from the independent to the dependent variables, MacKinnon, and colleagues (2004) suggest bootstrapping style over Sobel test especially regarding power and Type I and II error rates. The significance of the indirect effects was estimated together in the absence of the intervening variable(s) (total effects, denoted C paths) and in their presence (direct effects, denoted C' paths).

To confirm complete mediation, in the presence of the intervening variable(s) (C' path), the total effect of the independent variable on the outcome (C path) must reverse to statistically non-significant whereas the indirect effect is significant. Partial mediation, on the other side, emerges when the C' path

maintains its significance but is conspicuously reduced and the indirect effect is significant. Lastly, effect ratios were rated to show the amount of the total effect that is clarified through the indirect effects. This is likely to be a better way to establish mediation effects *(Shrout and Bolger, 2002).*

Accordingly, Table 2 shows hypotheses, including betas, significance levels, paths, and outcomes. The findings discloses that JS is negatively associated with PR (β =-0.27 $p < 0.05$) while PR is positively related to SWB ($\beta = 0.21$, $p < 0.01$), supporting H2 and H3. However, we couldn`t find a direct statistically significant relationship between JS and SWB

For the moderating effects of OS, a two-step procedure was used to test the hypothesis. The PLS allows evident calculation of the standardized latent variable scores after saving the obtained ones. Here, all items of PR and OS were standardized. Following this method, the standardized question items were multiplied. However, the outcomes don't support the moderating effect of OS on the relationship between PR and SWB.

Table 2. Hypothesis Testing Results

Relationships	Path Coefficent β	Hypothesis	Outcomes
JS→SWB	-0.098	1	Not Supported
JS→PR	-0.366**	2	Supported
PR→SWB	0.207**	3	Supported
OS X PR→SWB	-0.065	5	Not Supported

4.1 Structural Model

The coefficient of determination (R^2) and the Goodness-of-Fit Index (*GoF*) is examined to verify the PLS-SEM approach. As recommended by Chin (1998), the ranking of R^2 values is small ($.02 \leq R^2 < .13$), medium ($.13 \leq R^2 < .26$), or large ($.26 \leq R^2$). Besides, *Tenenhaus et al. (2005)* defines the GoF (Goodness of Fit) index as the explanatory power of the model. When 0.50 is taken as the threshold value for for commonality (Fornell and Larcker, 1981), the GoF ratings are ranked as small ($.1 \leq GoF < .25$), medium ($.25 \leq GoF < .36$), or large ($.36 \leq GoF$).

Table 3 shows R^2 and *GoF* values demonstrating the fit measures of the structural model. Regarding the ranking of R^2 effect sizes, the effect size for PR ($R^2 = .13$) is medium, while for SWB the effect size ($R^2 = .29$) is large. According

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to another fit measure, the result of *GoF* was .23 demonstrating a small sized fit (see Table 3).

Table 3. Structural Model

Fit Measures	Endogenous Constructs	R2
	PR	.13
	SWB	.29
GoF		.23

Note1. **GoF = √ Average Communality x Average R^2**

4.2 Mediation

To reveal the mediator role of PR in between JS and SWB, a mediation test is conducted on SmartPLS 3.0. Findings of the mediation analysis are expressed in Table 4. According to the findings, the effect of JS on SWB is fully mediated by PR (effect ratio of 0.45), supporting H_5.

Table 4. Tests of mediation in the structural model

Relationships		Total effect C path Estimate	Total effect C` path Estimate	
From	To			Effect ratio
JS	SW	-0.366**	-0.098	0.73

5. Conclusions

Since SWB is complex and difficult to unravel, it is necessary to develop models that envisage the individual, organizational and job influences. Although, the model of the current work is not exhaustive in considering all potential determiners, to the best of the authors' knowledge, it is among the first to examine the indirect impact of JS on SWB through PR and OS with the data taken from seafarers in merchant vessels sailing internationally. The data were analyzed with partial least squares structural equation modelling methods.

In ship management literature JS is mostly correlated to burnout and fatigue and there is a lack of studies that relates JS to resilience and wellbeing. In their working activity, seafarers are exposed to high levels of stress and to evaluate special physiological or psychological problems created by the shipboard environment is frequently recommended by forces in the industry. However, despite the determination of stress as a cause of undesirable consequences such as fatigue, burnout and accidents in maritime sector the results of the study do not

support the link between JS and SWB. One possible explanation for this result maybe that since seafarers experience more stress and job strain than is observed in the general population, it has become an integral part of their work, they might underestimate JS when compared to OS and PR both of which are less observed in shipping organizations. The results also support that PR increases SWB of seafarers and it not only directly increases the level of SWB but also acts as a mediator in the association between JS and SWB. So, the present examination of PR as a mediating variable in the relationship between JS and SWB is a step to move beyond the investigation of elements of the JS in isolation.

Factors that increase the level of PR among seamen is essential as it enhances organizational adaptability of shipping companies which function in highly stressful business environments. Resilience among seafarers is a critical necessity to function in the chaotic world of seafaring and thus maritime organizations need to support their employees to improve their coping mechanisms not only to resolve current challenges but to exploit opportunities and create a successful future. A better understanding of PR role in developing seafarers wellbeing serves up a new way to decrease the number of events which have the potential to entail serious adverse consequences. Therefore, an important contribution of this paper is to provide evidence that support the positive link among JS, PR and SWB which is neglected in ship management literature.

Finally, there is also some evidence in the literature that OS reduces the negative effects of JS by encouraging employees cope with the stress. However, this study extends prior research by investigating the moderation effect of OS on SWB associated with positive psychological strengths like PR for the first time. Accordingly, the hypothesis proposing that the positive relationships between PR and SWB will be stronger when OS is high rather than low is not supported. PR has a mediation role on the relationship between seafarers' JS and SWB. But when OS is included in the model or in other words when seafarers are supported by their organizations, the positive relationship between PR and SWB is not increased or decreased. One possible explanation for this result maybe PR buffers the effect of OS and if so, OS may have little or no effect on wellbeing when seafarers PR level is high, but perhaps can be very beneficial for those whose capacity to "bounce back" after a threatening, adverse or challenging period is low. In any case, the findings of the study might serve to encourage the salience of PR and OS in shipping and stimulate its emerging place as a topic of interest into one of prominence in models of SWB.

Other explanation maybe different professions perceive demonstrations of support differently and thus the antecedents and consequences of OS within those professions may vary. Accordingly, some researchers suggest that OS studies should take into consideration the impact of different types of job stressors. And more specifically, OS may be negatively affected by detrimental stressors like seafarers confront, but perhaps can coexist at high levels with stressors that have potential motivational and performance benefits. For that reason, Benjamin

and colleagues (2012) suggest researchers should pay attention to the various stressors and strains of jobs when trying to delineate more clearly the role of OS and the conditions under which it may influence well-being (e.g., when other sources of support are not exist, when facing chronic versus acute stressors, etc.).

Consequently, findings of the study suggest that SWB results from the combination of various individual, job and organizational factors. Managers and leaders of the shipping companies may not have a chance to control the inherent stressors of seafaring occupation such as living and working in the same confined environment, restricted social interaction, and isolation from family. Yet, they can provide training and support programs and practices to cope with the environment which is often unforeseeable and subject to rapid change.

Limitations and Future Research

This study was designed during the Covid-19 pandemic process which limits conclusions about causal relationships and therefore, results should be interpreted with this constraint in mind. Future research would benefit from examining the research model and hypotheses in normal periods and reveal the differences. Further, it should be noted that findings are specific to seafarers who are subject to a strict training process to overcome several stressors due to their demanding working environment. This implies that the generalization of the study is arguable and thus data obtained from different occupations and the comparison of different industries will deepen the understanding of the influence of research variables. In addition, there are many other mediating and moderating variables such as leadership and personality type that can influence the relationship between OS and SWB. Further studies considering these factors are needed to better understand the mechanisms that promote seafarers' SWB.

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