

The impact of seafarers' subjective well-being and general self-efficacy on job burnout

-- The mediating role of psychological resilience

Jingyuan Li¹, Fangwei Zhang^{2, *}, Minghua Sun³, Huan Ni¹, Taiyang Li¹

¹School of Navigation and Shipping, Shandong Jiaotong University, Weihai, China

²School of International Business, Shandong Jiaotong University, Weihai China

³ College of Navigation, Jimei University, Xiamen, China

* fangweirzhang@163.com

Abstract

Purpose: To explore the relationship between job burnout in seafarers and subjective well-being and general self-efficacy, a structural equation model is constructed. **Methods:** This study conducted a questionnaire survey with seafarers as the research subjects, distributing a total of 451 questionnaires. Statistical analysis of the questionnaire data is performed using SPSS 26.0, and structural equation modeling is conducted using AMOS 24.0. **Results:** The constructed structural equation model demonstrated a good overall fit. Both subjective well-being and general self-efficacy are significantly negatively correlated with job burnout. Psychological resilience played a partially mediating role between subjective well-being and job burnout. **Conclusion:** Subjective well-being and general self-efficacy are two crucial influencing factors leading to job burnout in seafarers. Psychological resilience can mitigate job burnout levels by increasing subjective well-being, and it acts as a partial mediator between subjective well-being and job burnout.

Keywords

Job burnout, subjective well-being, general self-efficacy, Psychological resilience.

1. Introduction

According to the investigation and statistics on maritime accidents by the International Maritime Organization, approximately 80% of maritime incidents are attributed to human factors [1]. A vessel, being a complex system, requires crew members to perform various tasks under highly concentrated attention, including ship maneuvering, navigation monitoring, and equipment maintenance [2]. Therefore, the mental and physical health of crew members directly impacts the safety of maritime navigation. Seafarers belong to a profession with high-pressure risks, and their mental health issues are closely related to the nature of their work. The characteristics of maritime work contain intensive working hours, closed and single working environments, and inconvenient network communications, which make seafarers more prone to burnout [3]. For the shipping industry, the issue of seafarer job burnout significantly affects the mental and physical health, work efficiency, and maritime safety of crew members.

Thus, this study engages in exploratory analysis of the influencing factors of job burnout among seafarers. The aim is to provide theoretical foundations and decision support for alleviating job burnout among seafarers, enhancing their work enthusiasm, and improving productivity.

2. Literature Review

The term "burnout" first emerged in the 1970s when New York clinical psychologist Freudenberger introduced the concept in 1974. He described burnout as a state of extreme exhaustion experienced by professionals in the service industry due to long working hours, excessive workload, and high job intensity [4]. According to the definition by Maslach and Jackson, job burnout is a condition characterized by the depletion of feelings, emotions, and behaviors under prolonged high work intensity. It manifests as emotional exhaustion, cynicism, and reduced personal accomplishment [5]. Specifically, emotional exhaustion refers to an individual's state of fatigue and loss of energy due to the excessive consumption of emotional resources, often considered a predictive dimension of burnout. Cynicism describes an individual's negative, indifferent, and overly distant attitude toward others, representing the interpersonal dimension of burnout. Reduced personal accomplishment signifies a decline in an individual's sense of competence and work-related achievements, reflecting a negative evaluation of one's abilities and work value—a self-efficacy dimension of burnout [6]. Subsequently, many researchers have given special attention to the phenomenon of job burnout.

Job burnout, characterized as a negative state, is influenced by various factors. Due to the distinct characteristics of different professions, the causes of job burnout vary among different occupational groups. Maslach and colleagues conducted a survey in five industries (teachers, healthcare professionals, social workers, psychologists, and legal consultants) in two countries (the United States and the Netherlands) and found similar levels of job burnout among professionals in the same industry in both countries. This indicates that job burnout is more associated with the characteristics of the profession rather than individual traits [7]. Currently, research on job burnout tends to focus on professions such as doctors, teachers, and nurses, with relatively less attention given to the job burnout of seafarers. From previous studies, it can be observed that subjective well-being has a certain impact on job burnout, showing a negative correlation between job burnout and happiness [8]. Hu found that the more severe the job burnout, the lower the subjective well-being [9]. Currently, research suggests a significant correlation between self-efficacy and job burnout. Job burnout is an effective predictor variable for self-efficacy, and conversely, self-efficacy is an effective predictor variable for job burnout [10]. Both subjective well-being and psychological resilience fall within the realm of positive psychological qualities in the field of positive psychology [11]. Previous studies have indicated that psychological resilience, as a positive psychological resource, can mediate the relationship between subjective well-being and job burnout. High psychological resilience can positively alleviate the phenomenon of job burnout [12].

Therefore, this study constructs a structural equation model with job burnout as the dependent variable, subjective well-being and general self-efficacy as independent variables, and psychological resilience as the mediating variable. The structural equation model is employed to explore in-depth the relationships among seafarers' subjective well-being, psychological resilience, general self-efficacy, and job burnout.

3. Research Subjects and Methods

3.1. Research Subjects

This study was conducted from May 10, 2023, to September 16, 2023, using a random sampling method to survey seafarers. A total of 451 questionnaires were distributed, and 427 valid questionnaires were collected, with an effective recovery rate of 94.7%.

3.2. Research Tools

This study employed a questionnaire survey method, with the questionnaire primarily divided into participant basic information and research scales. Basic information included age, maritime experience, marital status, educational level, family status, position, and working navigation area. The scales selected for this study included the Maslach Burnout Inventory General Survey (MBI-GS), the Connor-Davidson Resilience Scale (CD-RISC), and the Subjective Well-Being Scale.

3.2.1. Maslach Burnout Inventory General Survey (MBI-GS)

The MBI-GS adopts a Likert 7-point scale, with 0 indicating "Never" and 6 indicating "Very Frequently." The inventory comprises three parts: Emotional Exhaustion, Cynicism, and Reduced Personal Accomplishment. Emotional Exhaustion consists of 5 items, Cynicism consists of 5 items, and Reduced Personal Accomplishment consists of 6 items, making a total of 16 questions [12]. The six items in the Reduced Personal Accomplishment dimension are scored in reverse. The Cronbach's Alpha coefficient for this inventory is 0.876.

3.2.2. Connor-Davidson Resilience Scale (CD-RISC)

The CD-RISC, developed by Connor and Davidson in 2003, aims to assess individuals' levels of psychological resilience. CD-RISC consists of 25 items, and in this study, the three-dimensional classification by Zhang and Yu is used, dividing psychological resilience into Resilience, Strength, and Optimism [14]. Each item in CD-RISC uses a 5-point Likert scale, ranging from 0 (Never) to 4 (Almost always) for scoring. The overall psychological resilience score can be calculated based on the scores of each item, where a higher score indicates better psychological resilience [15]. The Cronbach's Alpha coefficient for this scale is 0.955.

3.2.3. Subjective Well-being Scale

The Subjective Well-being Scale consists of three parts: the Quantity of Happiness Scale, the Emotional Scale, and the Life Satisfaction Scale [15]. The Quantity of Happiness Scale, developed by Campbell (1976), includes two parts: Overall Emotional Index and Life Satisfaction. The Emotional Index comprises 8 items, and Life Satisfaction comprises 1 item. The scale uses a 7-point Likert scale, and the final score is the sum of the average score of the Emotional Index and the Life Satisfaction score (weighted by 1.1) [17]. The Emotional Scale, developed by Bradburn (1969), consists of Positive Emotions and Negative Emotions, each containing five items. Participants score one point for each positive item selected and each negative item not selected, with the final score being the sum of positive and negative item scores plus 5 [18]. The Life Satisfaction Scale, developed by Diener (1985), includes 5 items and uses a seven-point Likert scale, where 1 represents "Strongly Disagree," and 7 represents "Strongly Agree." A higher score indicates higher life satisfaction [19]. The Cronbach's Alpha coefficient for this scale is 0.914.

3.3. Statistical Methods

Descriptive statistics and correlation analysis were conducted on the data using SPSS 26.0 software. Additionally, Amos 24.0 is employed to construct a structural equation model, with a significance level (α) set at 0.05.

4. Results

4.1. Basic Information of Survey Participants

In this study, a total of 427 valid questionnaires were collected. Among the 427 surveyed seafarers, 20.1% were below 30 years old, 47.5% were aged between 30-40, 24.6% were aged between 40-50, and 7.7% were above 50. Regarding the distribution of participants' positions,

captains accounted for 17.1%, chief engineers for 8.4%, officers for 30.2%, engineers for 16.4%, and ordinary crew members for 27.9%.

4.2. Job Burnout Status

Currently, there is no unified standard for measuring job burnout. In this study, the average values of the three dimensions were used as the threshold. When the scores of all three dimensions were below the average, there is no job burnout. If one dimension scored higher than the average, it is considered mild job burnout; if two dimensions were higher than the average, it is moderate job burnout; and if all three dimensions were higher than the average, it is considered severe job burnout [20]. According to this standard, the results indicated that 18.3% of the surveyed participants had no job burnout, 35.9% had mild job burnout, 28.2% had moderate job burnout, and 17.6% had severe job burnout. It is evident that the job burnout situation among the participants is concerning, requiring more attention and focus on addressing the issue within the seafaring community.

4.3. Correlation Analysis of Job burnout, Subjective Well-being, and Psychological Resilience

Spearman correlation analysis is conducted between the three dimensions of job burnout and psychological resilience, as well as subjective well-being. The results are shown in Table 1. Emotional Exhaustion dimension showed a significant negative correlation with subjective well-being and all three dimensions of psychological resilience ($P<0.05$). Cynicism is significantly negatively correlated with subjective well-being and all three dimensions of psychological resilience ($P<0.05$). Reduced Personal Accomplishment is significantly negatively correlated with subjective well-being and all three dimensions of psychological resilience ($P<0.05$).

Table 1: Correlation Analysis of Job Burnout, Subjective Well-being, and Psychological Resilience

Factors	1	2	3	4	5	6	7
1.emotional exhaustion	1						
2.cynicism	.760**	1					
3.decreased professional self-efficacy	.780**	.859**	1				
4.Optimism	-.172*	-.319**	-.490**	1			
5.Self-efficacy	-.201**	-.328**	-.569**	.774**	1		
6.Self-efficacy	-.225**	-.327**	-.563**	.792**	.938**	1	
7.subjective well-being	-.251**	-.224**	-.284**	0.146*	.312**	.302**	1

4.4. Structural Equation Model Construction

In this study, questionnaire data were imported into Amos software to construct a structural equation model with the three dimensions of job burnout as dependent variables, subjective well-being as the independent variable, and psychological resilience as the mediating variable.

The constructed structural equation model is shown in Figure 1. The constructed structural equations are shown in Figure 1, where X1 is defined as subjective well-being, X2 as general self-efficacy, M as psychological resilience, and Y1, Y2, and Y3 as emotional exhaustion, cynicism, and decreased professional self-efficacy, respectively. The model used the maximum likelihood method to estimate the initial model, and the results showed that all path coefficients in the model reached significance ($P<0.05$). Therefore, adjustments were made based on the modification indices (MI). After modification, the model fit improved, and specific fit indices are presented in Table 2.

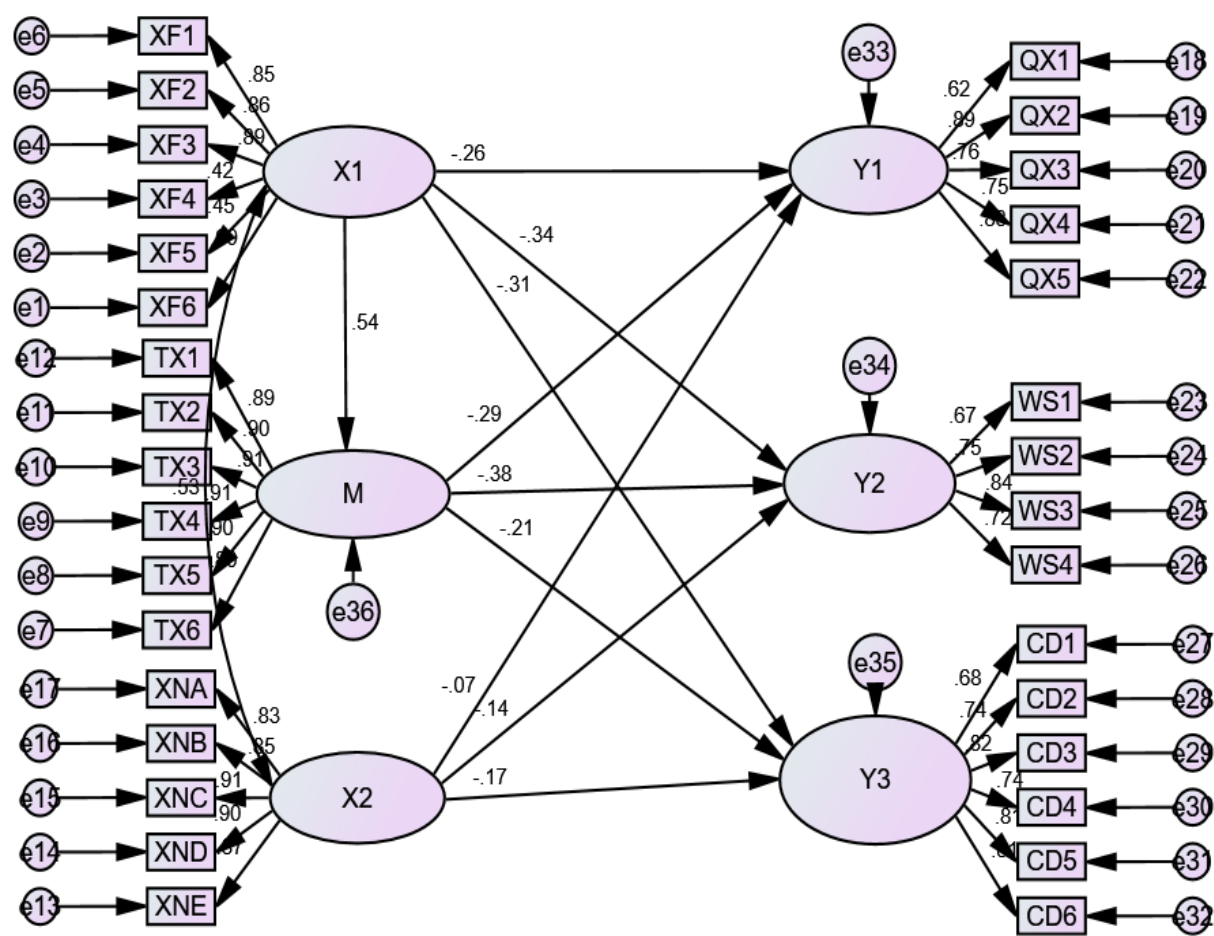


Figure 1: Structural equation modeling diagram

The structural path coefficients delineate the significant levels of causality among variables and the extent to which a one-unit change in the independent variable contributes to changes in the dependent variable. The path coefficients between measured variables are presented in Table 3. From the Table 3, it is discerned that the subjective Well-being exerts a notably positive impact on psychological resilience, with a standardized path coefficient of 0.539. Furthermore, the subjective well-being exhibits a significant negative influence on the dimension of cynicism, the standardized path coefficient is -0.34. Likewise, the subjective Well-being manifests a statistically significant negative impact on the dimension of emotional exhaustion, characterized by a standardized path coefficient of -0.264. Correspondingly, the subjective Well-being demonstrates a substantial negative effect on the dimension of decreased professional self-efficacy, as reflected in a standardized path coefficient of -0.335.

Table 2: Fit Indices of the Structural Equation Model

Indicators	Absolute Fit Indices		Incremental Fit Indices			Parsimonious Fit Indices	
Specific Categories	X ² /df	RMSEA	IFI	TLI	CFI	PCFI	PNFI
Evaluation Criteria	<5	<0.08	>0.9	>0.9	>0.9	>0.5	>0.5
Fit Indices	2.823	0.065	0.943	0.936	0.932	0.843	0.818

Table 3: Structural Equation Path Coefficients

Path	S.E.	C.R.	Std. Estimate	P-value
Psychological Resilience <--- Subjective Well-being	.042	9.677	0.539	***
Cynicism <--- Subjective Well-being	.074	-5.174	-0.335	***
Emotional Exhaustion <--- Subjective Well-being	.078	-3.842	-0.264	***
decreased professional self-efficacy<--- Subjective Well-being	.078	-3.842	-0.374	***
Cynicism <--- Self-efficacy	.116	-2.762	-0.142	0.006
Emotional Exhaustion <--- Self-efficacy	.125	-1.311	-0.073	0.19
decreased professional self-efficacy<--- Self-efficacy	.113	-3.025	-0.167	0.002
Cynicism <--- Psychological Resilience	.084	-6.669	-0.376	***
Emotional Exhaustion <--- Psychological Resilience	.088	-4.848	-0.287	***
decreased professional self-efficacy<--- Psychological Resilience	.076	-3.716	0.208	***

“*” define as P<0.05; “**” define as P< 0.01; “***” define as P<0.001

In the realm of self-efficacy, its negative impact on the dimension of cynicism is discernible with statistical significance, as indicated by a standardized path coefficient of -0.142. However, the negative impact of self-efficacy on the dimension of emotional exhaustion is statistically insignificant. Notably, the negative influence of self-efficacy on the dimension of decreased

professional self-efficacy is statistically significant, elucidated by a standardized path coefficient of -0.167. Furthermore, the negative influence of psychological resilience on the dimension of cynicism, emotional exhaustion, and decreased professional self-efficacy is statistically significant, with standardized path coefficients of -0.376, -0.287, and -0.208, respectively.

Table 4: Bootstrap test for the mediating effect of psychological resilience

Path	Std. Estimate	Bootstrap 95%CI		p-value
		Lower	Upper	
Subjective Well-being → Emotional Exhaustion	-.264	-.410	-.104	.001
Subjective Well-being → Cynicism	-.335	-.465	-.218	.000
Subjective Well-being →decreased professional self-efficacy	-.309	-.440	-.184	.000
Subjective Well-being → Psychological Resilience → Emotional Exhaustion	-.155	-.267	-.061	.000
Subjective Well-being → Psychological Resilience → Cynicism	-.203	-.300	-.125	.000
Subjective Well-being → Psychological Resilience → decreased professional self-efficacy	-.112	-.204	-.034	.004

In this study, the mediating effect of psychological resilience was examined by the percentile Bootstrap method and the bias-corrected percentile Bootstrap method. The 95% CI was calculated for 5000 samples randomly selected repeatedly from the original data with release and the results are shown in Table 4. It indicates that subjective well-being has a significant direct effect on emotional exhaustion, with psychological resilience demonstrating a significant mediating effect between subjective well-being and emotional exhaustion. The direct and mediating effect sizes are -0.264 and -0.155, respectively, constituting 63% and 37% of the total effect. Subjective well-being significantly influences the dimension of cynicism, with psychological resilience acting as a significant mediator between subjective well-being and cynicism. The direct and mediating effect sizes are -0.335 and -0.203, respectively, contributing to 62.2% and 37.7% of the total effect. Subjective well-being significantly affects the dimension of reduced personal accomplishment, and psychological resilience serves as a significant mediator between subjective well-being and reduced personal accomplishment. The direct and mediating effect sizes are -0.309 and -0.112, respectively, representing 73.4% and 26.6% of the total effect.

5. Conclusion

Based on structural equation modeling, this study investigated the mechanisms by which crew members' general self-efficacy and subjective well-being affect burnout and the mediating role of psychological resilience. The main conclusions are as follows:

1. Relationship between Seafarers' Subjective Well-being and job burnout

Research findings reveal an inverse correlation between seafarers' subjective well-being and the three dimensions of job burnout (emotional exhaustion, cynicism, and reduced personal

accomplishment). This implies that higher scores in these dimensions are associated with lower subjective well-being among seafarers. This phenomenon may stem from the fact that in more satisfying work environments, seafarers can better cope with stress and emotional challenges, thereby mitigating the degree of emotional exhaustion. Cynicism refers to indifference and a detached attitude towards work and the profession. When individuals perceive themselves as happier, they are more likely to exhibit a positive attitude and interest in their work. Higher subjective well-being may foster stronger professional commitment, thereby reducing tendencies toward cynicism. The inverse relationship between subjective well-being and reduced personal accomplishment suggests that higher subjective well-being is associated with greater professional achievement. This could be attributed to the satisfaction and sense of accomplishment experienced in a work environment characterized by higher levels of happiness, motivating individuals to approach their work more positively.

2. Relationship between Seafarers' General Self-Efficacy and job burnout

Research results indicate an inverse relationship between seafarers' general self-efficacy and the three dimensions of job burnout, namely, cynicism, emotional exhaustion, and reduced personal accomplishment. This outcome suggests that higher general self-efficacy is associated with lower job burnout. This implies that seafarers who are confident in their abilities may effectively cope with professional stress, reducing the burden of job burnout. Seafarers with higher general self-efficacy are more likely to demonstrate a positive attitude towards work and willingly invest themselves in their tasks. Elevated general self-efficacy may decrease tendencies toward cynicism, enhance responsibility and interest in work. Simultaneously, seafarers with high general self-efficacy are more likely to experience a sense of achievement and satisfaction in their work, contributing to a proactive approach to professional challenges. These results underscore the protective role of individual general self-efficacy in mitigating job burnout, positioning the enhancement of seafarers' general self-efficacy as an effective strategy to reduce job burnout.

3. Mediating Role of Psychological Resilience in the Relationship between Subjective Well-being and job burnout

Research findings indicate that psychological resilience among seafarers plays a mediating role in the relationship between subjective well-being and job burnout. By elevating the level of psychological resilience, seafarers can enhance their subjective well-being and concurrently reduce job burnout. Psychological resilience allows seafarers to navigate work challenges more flexibly, aiding them in effectively coping with various professional stressors. Seafarers may employ psychological resilience as a positive emotional regulation strategy, alleviating negative emotions associated with work and fostering adaptability to the work environment. Seafarers with high psychological resilience are more likely to find enjoyment and satisfaction in their work, enabling them to approach work situations more positively. Consequently, this contributes to heightened subjective well-being and reduced job burnout.

In summary, this study, employing mediation analysis and structural equation modeling, verifies the partial mediating effect of psychological resilience in the relationship between subjective well-being and job burnout. The results highlight that low subjective well-being and low general self-efficacy are contributing factors to seafarers' experience of job burnout.

References

- [1] J.Y. Sun, F. Sun: Human factors and preventive measures in maritime collision accidents. *Water Transport Management*, Vol. 42(2020) No.11, p. 29-31.
- [2] M. Zhang, J.H. Lu: Research progress on the physical and mental illnesses of ocean-going seafarers and influencing factors. *Chinese Journal of Nautical Medicine and Hyperbaric Medicine*, Vol. 1(2016), 80-83.

- [3] Y.S. Chung, P.T.W. Lee, and J.K. Lee: Burnout in seafarers: its antecedents and effects on incidents at sea. *Maritime Policy and Management*, Vol. 44 (2017) No. 7, p. 916-931.
- [4] H.J. Freudenberger: Staff Burn-Out, *Journal of Social Issues*, Vol. 30(1974) No. 1, p. 159-165.
- [5] C. Maslach, S. E. Jackson: MBI: Maslach Burnout Inventory, Palo Alto, CA: University of California, 1986.
- [6] Y. Ni, J.P. Jiang, J.J. Liu: Review of job burnout research. *Social Science Dynamics*, Vol. 11(2022), p. 79-84.
- [7] C. Maslach, W.B. Schaufeli, M.P. Leiter. "Job burnout." *Annual review of psychology* Vol. 52(2001) No. 1, p. 397-422.
- [8] Y.H. Liu, Research on job burnout and subjective well-being of ideological and political teachers, *Journal of Hubei Correspondence University*, Vol. 27(2014) No. 19, p. 55.
- [9] T. Hu, D.S. Zhao , H. Yang: Research on the characteristics of happiness and job burnout of teachers in "newly upgraded universities in Guizhou, *Journal of Guizhou Institute of Education*, Vol. 24(2008) No. 8, p. 38-40.
- [10] X.R. Liu: Relationship between professional identity, job satisfaction, self-efficacy, and job burnout of university foreign language teachers, *Journal of Jimei University (Education Science Edition)*, Vol. 17 (2016) No. 6, p. 11-17.
- [11] H. Saricam, H. Sakiz: Burnout and Teachers' Self-Efficacy among Teachers Working in Special Education in Turkey. *Educational Studies*, Vol. 40(2014) No. 4, p. 423-437.
- [12] J. Huang: The relationship between physical exercise and subjective well-being in higher vocational students: The mediating role of psychological resilience, *Psychological Monthly*, Vol. 15(2020) No. 17, p. 122-123.
- [13] C.P. Li, K. Shi: The impact of distributive justice and procedural justice on job burnout. *Acta Psychologica Sinica*, Vol. 35(2003) No. 5, p. 677-684.
- [14] K.M. Connor, J.R. Davidson: Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and anxiety*, Vol. 18 (2003) No. 2, p. 76-82.
- [15] Y. Xu, R. Zhou, C.M. Fu: Validation and structural exploration of the Psychological Resilience Scale (CD-RISC) in college students, *Chinese Journal of Health Psychology*, Vol. 24(2016) No. 6, p. 894-897.
- [16] X.D. Wang, X.L. Wang, H. Ma: *Manual of Mental Health Assessment Scale (Revised Edition)*. China Journal of Mental Health, 1999.
- [17] A. Campbell, P.E. Converse, W.L. Rodgers: *The Quality of American Life: Perceptions, Evaluations, and Satisfactions* (Russell Sage Foundation, USA 1976).
- [18] N.M. Bradburn: *The Structure of Psychological Well-Being*. (Aldine Publishing Company, USA, 1969).
- [19] W. Pavot, E.D. Diener: Review of the satisfaction with life scale, *Psychological Assessment*, Vol. 5(1993), No. 2, p. 164-172.
- [20] Y.L. Zhang, X. Li, J.W. Liu. Research on the relationship between input-output imbalance and job burnout of oil workers, *Practical Preventive Medicine*, Vol. 28(2021) No. 7, p. 798-801.