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Does Burnout Working Conditions Affect Marine Pilots' Job Satisfaction and Turnover Intentions? A Study of Turkish Marine Pilots

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Abstract
The occupation of marine pilotage is one of the rarely studied subjects of maritime sector. Based on the very scarce literature, the number of studies related with working conditions of marine pilots is very limited. Hence, the main significance of this research is being the first study that reveals the relationship between marine pilots' working conditions and burnout and its impact on job satisfaction and turnover in Turkey. At start of this study it was predicted that working conditions such as; number of maneuver, time of arrival/departure from ship for maneuvering, lack of sleep, weather conditions, equipment conditions, sea conditions, period of maneuver time (day-night), competency of crew, communication skills of crew, irregular working hours, lighting of bridge, ventilation of bridge, temperature of bridge and noise would be significantly related to burnout of marine pilots which in turn effect their job satisfaction and turnover intentions. The study is empirically based on the primary data collected from 100 marine pilots' in Turkey. Data obtained from questionnaires have been analyzed through the SPSS statistical packet program and PLS-Graph. The results suggest that marine pilots' lack of job satisfaction and increasing turnover intentions are outcome of their stressful working conditions.
Keywords: Marine pilots, maritime, burnout working conditions, job satisfaction, turnover intentions

Introduction

In the period from past to present, one of the most important sea trade actors have been marine pilots. The most conspicuous characteristic of this occupation that analyzed in limited number of studies is working conditions. Their unusual and unscheduled working hours besides shifting at work are the best known features of marine pilots' working conditions.

Owing to the fact that marine pilots direct and control the vessel through the harbor, their heavy responsibilities related with working conditions bring about stress and tiredness

that may influence their job satisfaction and turnover. Unfortunately, there are insufficient studies into this extremely important professions' job satisfaction and turnover factors associated with their burnout working conditions in the related literature.

This research was conducted to determine the impacts of working conditions of Turkish marine pilots on their general level of job satisfaction and turnover. Firstly, the study made elaborative clarification about marine pilot profession, job satisfaction and turnover intentions related with their working conditions. Then the research proved this claim by analyzing Likert type questionnaires consisting of marine pilots' working conditions, job satisfaction and turnover intentions. These questionnaires were administered to 320 marine pilots in Turkey and 100 of them returned for statistically evaluation. After using quantitative and qualitative methods to ascertain the effects of working conditions on job satisfaction and turnover, the study was concluded by prudential recommendations.

Definitions

Marine Pilots and Their Burnout Working Conditions

According to National Research Council Staff's definition the marine pilot is a local expert who gets on board while navigating in order to bring the vessel safely to the port. It's a well known fact that marine pilot is not working as a member of vessel; he just provides local knowledge and professional navigation advices to the ship's master. However when he gets on board, marine pilot takes the control of the vessel and directs it through the near-shore and inshore waters as a local expert (National Research Council Staff, 1994, p. 67-70).

More specifically, berthing ships to the ports, departing ships from the ports and navigating crossing and operating the vessel on narrow channels and straits etc. are pilots' basic missions. According to IMPA (International Maritime Pilots Association) "pilot's main role is handling ships on and off the port wharfs and facilities and ensuring the safe transit of shipping in and out of port during what is recognized as the high-risk element of a ship's passage"(International Maritime Pilots Association –IMPA, 2004).

When the Fatigue Management Program for Canadian Marine Pilots is reviewed, it has clearly shown that marine pilot is local expert who has deeply information about local area, maneuvering skills and navigational practice. However, he is employee of a private or government organization to ensure pilotage services (Fatigue Management Program for Canadian Marine Pilots, 2002).

Due to marine pilot works in the name of his company which licences him, he not only protects the interests of the company, but also follows the interests of the ship owners. Although captains of the ships are experienced; they usually may not be familiar with local waters, sea, traffic and berthing conditions. Therefore when marine pilot is on board; he retains command and responsibility of the vessel and provides safe navigation (Parliament of Australia Reports, 2001, p.2).

Marine pilots' tasks start when getting the command of ships from masters. Their duties end when ships reach safety waters in terms of departure and when ships call ports safely in terms of arrival. That's why they are major actors of sea trade when ships need maneuvering for arrival and departure of ports. Due to their vital importance for ships, marine pilots' working conditions are worth to consider.

Related to marine pilots' working conditions, one of the most spectacular of them is "Fatigue Management Program for Canadian Marine Pilots (2002)". According to this research, marine pilots' working conditions vary from very good to very poor. Worst conditions include ships with no appropriate heating and/or defrosting equipment, and crews that are fatigued or inexperienced. Driving conditions has also strong effect on marine pilots. Some pilots have cabs drive them to and from work. It takes them between 10 and 60 minutes. On the other hand, some pilots drive their cars and take between 45 and 120 minutes to get to and from work. After an 11-hour transit, sometimes accomplished with little prior sleep, a pilot may be quite sleepy on the drive home.

One more similar study was made in Australia by AMSA (Australian Maritime Safety Authority, 1998) about work effect of marine pilots' on their wives and families. It was proved that unusual working hours, working at nights affects their lives. Besides, earning high level of wages and present commercial concern of their companies force them to work more and to reduce resting times.

On the other hand, unusual working hours and shifting may cause being careless about monitoring the position, reacting to the incidents slowly, miscalculates of berthing and misusage of navigational equipment and bridge equipments as radar and steer (AMSA Reports, 1998). This study proves that marine pilots' working conditions have major affect on their job performance.

Prior researches indicate that a pilot's work is generally characterized by irregular scheduling and compromised sleep. For instance, the study related with work schedule of UK pilots showed that the most of the maneuvering times usually occurred apart from the normal circadian cycle (Shipley&Cook, 1980). Therefore it's commonly believed that the most striking characteristic of marine pilotage is working at night.

Similarly the study of W. Rhodes and G. Rhodes (2002) shows that due to ever-changing water conditions, weather conditions and sea conditions requires serious concentration and decision-making ability. In addition, long working hours and sleep deprivation occurs as a result of bad weather.

It's apparent form the literature review that there are several studies relating with working conditions of marine pilots. Due to the fact that the subject of marine pilots' working conditions is rather an extensive area, just burnout working conditions have been investigated at this research. When we look at burnout concept, the most commonly accepted definition of is the three-component conceptualization developed by Maslach and colleagues. Emotional exhaustion is characterized by a lack of energy and individuals feel that they are emotionally overextended and exhausted at work. Cynicism refers to the development of

negative, cynical attitudes and feelings about one's clients and excessively detached responses to other people at work. The third component of burnout, reduced personal accomplishment is the tendency to evaluate oneself negatively, particularly in relation to one's work with clients or interactions with people at work. (Maslach&Jackson, 1981). From these three characterizations, the "emotional exhaustion" has been considered as one of the core burnout dimension that related with working conditions at this paper.

Job Satisfaction and Turnover

The literature about job satisfaction and turnover of marine pilots is very limited. Therefore a remarkable research which belong Andersen et al. has been used as a guide in this paper.

Marine pilots' job satisfaction is related with physical and social dimensions as working at nights, holidays and non-working days. With regard to previous studies, job satisfaction is determiner of stress and satisfied personnel is more successful to struggle with daily stressors. On the other hand positive job characteristics and low stress enhance job satisfaction of employee (Andresen et al., 2007).

Due to shifting and rotating working system of marine pilots, they have problem with resting hours, leisure and biological rhythm. Despite the shifting system is planned before, vessel traffic causes imponderable working times. One more significant matter is value of spare time for marine pilots. As it is well known, most valuable times are holidays, weekends and special days that family, friends and social environment come together. When marine pilots work on these days, their high-valued spare times depreciate (Andresen et al., 2007).

On the other hand, marine pilots serve during all year and twenty four hours continuously. According to World Health Organization's definition health that is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, affects job satisfaction. Moreover previous studies showed that shifting system and working unusual hours influence employee to a certain degree (Parkes 2003; Morshead 2002; Bohle&Tilley, 1998).

When we examine turnover intentions in terms of marine pilots there are not sufficient studies in this area. On the contrary, the literature on turnover and job satisfaction is quite large, and we do not attempt to provide a comprehensive review here. Instead, we highlight a sample of important studies which are the determinants of employee turnover intentions and job satisfaction.

As a general definition, turnover intention is simply whether an employee has the objective of self-terminating his or her employment (DeTienne et al., 2012, p.380). According to Hackman & Oldham (1975) low turnover rate and low absenteeism is related with high job satisfaction. Moreover, several meta-analyses conducted across business disciplines have found evidence that job attitudes as job satisfaction and organizational commitment are positively related to job performance and negatively related to turnover intentions (Brown&Peterson 1993; Harrison, Newman, and Roth 2006). Clearly, high job satisfaction is

related with low absenteeism and low turnover intentions that affect totally organizational performance.

Up to relationship between job satisfaction and turnover intentions, marine pilots' working conditions which affect job satisfaction may be the reasons for their job turnover. According to study of Andresen (2007) some working conditions of marine pilots, i.e., working unusual hours, irregular working hours, and external conditions, such as the weather, lead to strain, reduce their job satisfaction. Consequently in this study, it is assumed that job satisfaction related with working conditions may be the predictor of marine pilots' turnover intentions.

Consequently, it is likely that marine pilots with high levels of burnout will have less job satisfaction and also higher propensity to quit the job. The review of the literature provides foundation for following Hypotheses 1, 2, 3 and 4:

- Hypothesis 1: Working conditions will be positively related to burnout of marine pilots.
- Hypothesis 2: Burnout working conditions will be negatively related to job satisfaction of marine pilots.
- Hypothesis 3: Burnout working conditions will be positively related to turnover intentions of marine pilots.
- Hypothesis 4: Job satisfaction will be negatively related to turnover intentions of marine pilots.

Methods

Sample and Procedure

The study is empirically based on the primary data collected from 100 marine pilots in Turkey. According to Turkish Marine Pilots Foundation's data there are 320 marine pilots and thus the response rate is consistent with other surveys of maritime field. Participation was optional for all respondents. Data was collected according to the preferences of pilots; face to face interactions or electronic mail.

A majority of the respondents (99%) were male and (94%) married. As to the educational qualification, 90% had obtained a bachelor degree, and (6%) held a postgraduate degree. 41% of the participants were aged between (41 – 50) years and the majority of the participants (25%) with job experience between (5– 10) years. As to the shifting system (31,6) respondents work 4 days in and 4 days out and (23,0) numbers of maneuver is between 50-59.

Measures

To test the above hypotheses, multi-item scales adopted from prior studies for the measurement of constructs were used. Working conditions was measured by 14 items. A common qualitative research technique – the focus group research method – and the literature (NSW Government's Report and Andresen et al., 2007) was used to reveal burnout working conditions items. A series of open ended questions were asked to 10 marine pilots to gain insight the respondents' perspective on burnout working conditions. Potential items

of burnout working conditions were determined by enabling respondents to express their clear ideas and feelings about their job. Ultimately, the following 14 items were specified: number of maneuver, time of arrival/departure from ship for maneuvering, lack of sleep, weather conditions, equipment conditions, sea conditions, period of maneuver time (day-night), competency of crew, communication skills of crew, irregular working hours, lighting of bridge, ventilation of bridge, temperature of bridge and noise. The relationship between working conditions and burnout was measured with these items. Respondents were asked to rate each working condition item contributed to their emotional burnout on a on a scale of choices such as 1 slightly or not at all and 5 very much. Frequencies of working conditions related to burnout are presented in Appendix.

On the other hand, job satisfaction was measured by 5 items adopted from Brayfield & Rothe (1951). Finally, 3-item scale adapted from Bluedorn (1982) was used to measure turnover intentions. All items were rated using a 5-point scale ranging from 1 ("Very strongly disagree") to 5 ("Very strongly agree").

Results

In order to identify the underlying structure of various measures a series of factor analysis were carried out. In this study exploratory factor analysis was used via SPSS 17. For confirmatory factor analysis and testing predicted model the partial least square (PLS) path modeling was used via PLS-Graph program. The reason for using this technique is that it is generally recommended in situations where the sample size is small or medium (Jörg, Ringle & Sinkovics, 2009).

First, exploratory factor analysis has been conducted to test factor structure 3 items in working conditions scale were deleted because they are not correlated with other factors positively and significantly and then we perform a second factor analysis to the remaining questions. Second factor analysis results showed that remaining items loaded on three factors as it was expected. All of the factor loadings were above 0.5, which was statistically valid (See Table 1). It was found that KMO was .824 and Bartlette's sphericity test was 3117,817, p <. 000. The results indicated that sample adequacy and the goodness of fit for factorial analysis were statistically valid. The cumulative distribution of the three factors was 65.03%, which showed a high level of explanation in the model. Using the composite reliability (CR) value and Cronbach's alpha value, the measurement instruments reliability was assessed and the lowest values are 0.912 and 0.852, respectively, which exceeds the recommended acceptable value of 0.7 (Nunnally & Bernstein, 1994). Taken together, these results confirm the reliability and validity of the measurement used in this study.

Hypothesis Testing

We used PLS path modeling which is a latent variable modeling technique that incorporates multiple dependent constructs and explicitly recognizes measurement error (Karimi, 2009). Another reason for using this technique is that PLS method can operate under limited number of observations and more discrete or continuous variables. Also, it is far less restrictive in its distributional assumption and applies to situations where knowledge about the distribution of the latent variables is limited and requires the estimates to be more closely

tied to the data compared to covariance structure analysis (Fornell & Larcker, 1981). The results of the analysis indicated in Table 2 support for all four hypotheses.

Conclusion

As stated earlier, the aim of this study was to identify the effect of burnout working conditions on marine pilots' job satisfaction and turnover intentions. Correspondingly, the strongest interrelation was found between working conditions and burnout as predicted in hypothesis 1. It means, burnout working conditions as high numbers of maneuver, long times to arrive/depart from ship for maneuvering, lack of sleep, unfavorable weather conditions, negative sea conditions, period of maneuver time (day-night), competency of crew, lack of communication skills of crew, irregular working hours, insufficient lighting of bridge, inadequate ventilation of bridge, temperature of bridge and noise have effects on Turkish marine pilots' job satisfaction and turnover intentions.

Besides, hypothesis 4 (Job satisfaction will be negatively related to turnover intentions of marine pilots) was the most common part of the study. Not surprisingly, the negative correlation between job satisfaction and turnover intentions has found as indicated previous studies. Turkish marine pilots' turnover intentions are related with their job satisfaction.

However, the most conspicuous and remarkable significance of this research was being the first study that reveals the relationship among marine pilots' burnout working conditions, job satisfaction and turnover intentions in Turkey. This main goal is achieved by determining not only the relationship between burnout working conditions and job satisfaction, but also determining relationship between burnout working conditions and turnover intentions. Consequently, it is likely that marine pilots with high levels of burnout will have less job satisfaction and also higher propensity to quit the job.

Lastly, the occupation of marine pilot which studied in limited surveys is substantial area for more researches. Further studies my measure burnout working conditions of marine pilots by using the remaining two dimension of burnout as cynicism and personal accomplishment. Moreover, the questionnaire may be applied to more than 100 pilots in the future studies.

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Table 1 Reliability and Factor Analysis

Factor	Factor Loadings of EFA	Factor Loadings of CFA	α	CR	AVE
Burnout Working Conditions	.55 .57 .61 .62 .69 .78 .79 .81 .85 .88 .89	.65 .69 .76 .80 .80 .84 .86 .88 .89 .94 .95	.92	.98	.736
Job Satisfaction	.70 .79 .79 .86 .88	.84 .87 .89 .90 .92	.94	.96	.834
Turnover	.76 .79 .82	.78 .81 .87	.86	.90	.600

Table 2. Correlations of Latent Variables

Variables	Mean	Std. Dev.	Burnout working conditions	Job satisfaction	Turnover

Burnout working conditions	2,9719	,63416	1	-,230**	,245**
Job satisfaction	1,9580	,72212		1	-,594(**)
Turnover	4,2833	,81838			1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Table 3. Hypothesis Testing Results

Hypothesis	Relationship	Path coefficient (*β*)	Results
H1	Working Conditions → Burnout	.42**	*Supported*
H2	Burnout working conditions → Job satisfaction	-.27**	*Supported*
H3	Burnout working conditions → Turnover	.24**	*Supported*
H4	Job satisfaction → Turnover	-.28**	*Supported*

Table 4. Frequencies of working conditions related to burnout

	FREQUENCY				
Items	**slightly**	**a little**	**moderately**	**quite a bit**	**very much**
number of maneuver	**2**	**21**	**41**	**24**	**12**
time of arrival and departure from ship for maneuvering	**6**	**30**	**42**	**17**	**5**
lack of sleep	**4**	**6**	**44**	**30**	**16**
weather conditions	**4**	**17**	**38**	**30**	**11**

equipment conditions	11	22	30	23	14
period of maneuver time (day-night)	4	10	52	24	10
competency of crew	14	16	39	19	12
communication skills of crew	17	15	39	20	9
irregular working hours	6	12	33	32	17
ventilation of bridge	17	25	42	12	4
bridge noise	11	14	40	26	8