

Vital exhaustion and psychosocial health among off-shore personnel working in the Philippines

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Abstract

The off-shore environment is a high-risk and demanding workplace exposing crew members to various physical and psychosocial stressors. A range of factors including weather extremes at sea, isolation from families, living in confined spaces and daily routine jobs may push workers to their limits affecting their well-being, productivity and safety. This study aimed to investigate the association between vital exhaustion (VE) and psychosocial health (PH) among off-shore personnel in the Philippines. A total of fifty-five respondents (54 male; mean age = 42.7 years) from an off-shore company located in the Philippines were assessed using the 21-item Maastricht Vital Exhaustion Questionnaire (MVEQ) and the Copenhagen Psychosocial Questionnaire III (COPSOQ III). The majority of them are assigned to the maintenance and marine departments with an average off-shore experience of 11.7 years. Crew members reported low VE levels and good PH scores. Furthermore, the highest PH recorded scores were observed in three COPSOQ dimensions namely Influence and Development, Interpersonal Relations and Leadership, and Outcome Scales. Lower recorded scores in COPSOQ scales such as in Further Parameters and Demands at Work were favourable associated with PH levels scores. There was a significant relationship among four PH dimensions and VE levels of respondents. There was also a significant relationship between VE and the demographic profile of off-shore personnel in terms of job assignment and work type however there was no significant association between PH and all demographic variables considered in the study. Majority of the participants claimed that environmental conditions are well-designed and safety concerns are managed appropriately in the workplace. The responses from off-shore personnel provide a clear picture of their overall health. The resilience and camaraderie among the crew members played a major role in keeping their VE levels low and promoting good PH scores.

1. INTRODUCTION

The off-shore industry, which produces needed fuel for cars, homes and factories, is considered to be one of the most dangerous places to work in due to its high-risk, isolated and demanding environment. Studies among American petrochemical workers and Danish merchants showed that the groups of labourers had a six-time higher mortality rate in comparison with other occupations ashore (Allison & Mandler, 2019; Borch et al., 2012). The reasons behind this disparity can be attributed to the higher number of accidents, cardiovascular diseases and lung cancer cases in the off-shore setting (Hjarne & Leppin, 2013). Similarly, maritime jobs are associated with various mental, psychosocial and physical stressors higher than the jobs of people working onshore (Oldenburg et al., 2009).

Employees deal with heavy machinery, toxic chemicals, combustible materials, working at heights and confined spaces. Off-shore workers toil long work hours in an isolated work environment for an extended number of days (Parkes, 2010). In addition, work could be demanding at times to meet client requirements and deadlines. Some workers

deal with stress better than others. The prolonged experience of stress may have the potential to affect their health and can also have a significant impact on their families (Wei-Qing, 2001).

Production operations in this deep-water gas-condensate reservoir might only last for another seven to ten years if no new gas fields are discovered (Velasco, 2018). Off-shore work is unstable lately with the introduction of renewable energy sources like wind and solar power. The Philippine domestic shipping industry faces two main issues namely short-term employment practice and the shortage of deck and engine officers. Non-officers and non-technical crew receive low wages; have limited opportunities for skills and career advancement and limited social protection mechanisms. These are the main reasons why most seafarers, especially the young and highly skilled mariners, join international shipping vessels (Anchustegui, 2011).

Vital exhaustion (VE) is defined as a condition where patients experience fatigue, hopelessness, listlessness, loss of libido, increased irritability and sleep problems. In a collaboration by Appels with Mulder (1989), they ruled out that VE as a predictor of another myocardial event within ten months and it can also be prognostic of a future myocardial infarction. Schnorpfeil and his group (2002) proposed in their study that VE is not just a cardiac health marker as predicted in many post cardiac arrest studies. It can also gauge the overall productivity and quality of life of healthy subjects or communities.

Psychosocial health (PH) on the other hand is an important link between mental and physical well-being. It is multidimensional in scope because it deals with a person's mental, emotional, social and spiritual health (WHO, 2004). The Canadian Mental Health Association (CMHA, 2020) defines psychosocial risks factors as organizational aspects that may affect the employees' psychological safety and health. These factors include the interaction between work content, work organization and management, other organizational and environmental conditions, and the skills and needs of the workers (ILO, 1986).

The assessment of VE and PH is relevant in maintaining the current state of health of crew members on board. Myra Estrine Levine's Four Conservation principles were used as a guide to discuss the association of VE and PH. The focus of the theory is to promote wholeness and adaptation through the conservation of energy, personal, structural and social integrities (Petiprin, 2016). As applied to this study, to achieve wellness an individual should maintain a balance of all four conservation principles. A disruption in either the internal or external environment is considered a threat to individual health. If various stressors go beyond the level of adaptation of a worker, it could lead to the disruption of energy levels causing VE. Consequently, it can affect work performance and morale conducting to a physical, structural and social integrity breakdown, being this individual state correlated to a poor PH. An inverse relationship between VE and PH can be expected in case the workers experience burnout since their VE scores will be high and their PH scores will be low. When workers have high VE levels, it could mean that their adaptation and conservation strategies are no longer effective. The VE and PH scores will vary among respondents according to their age, educational level, tenure, job assignment and work type.

Fatigue is a well-studied topic among seafarers (Allen et al., 2008) but its progression to VE needs further investigation in off-shore settings. To the best of my knowledge, no study has investigated the association of VE and PH among off-shore personnel. Work stressors faced by workers in their daily tasks make them a vulnerable group in developing mental disorders. Data gathered by the Philippine Statistics Authority in 2010 show that 200,000 or 14% of the 1.4 million Filipinos with disabilities had mental illnesses (Lally et al., 2019). There is also a stigma placed on mental illness, so patients often hide their symptoms. Psychiatric consults are quite expensive with only limited specialists practicing nationwide (Reyes, 2020). Furthermore, a meta-analysis regarding maritime health studies from 2000-2010 revealed the need to come up with more researchers particularly in psychological functioning (10.61%) and telehealth (7.58%) (MacLachlan et al., 2012). The majority of the studies were also conducted in Europe (Poland, 40 and Norway, 19) but only a few in Asian countries like the Philippines, India

and Middle Eastern counterparts. These Asian countries comprise the greatest number of maritime workers in both seafaring and drilling platforms. Most of the studies focused on seafarers, in which only a few were done on oilrig workers. Legal implications of health studies posed by several drilling companies inhibit researchers from getting enough data from oilrig installations. The primary aim was to investigate the association between VE and PH among crewmembers in the Philippines. The secondary aim was to determine if demographic variables (such as age, education, tenure, and job assignment and work type of the crew) might have a significant association with VE and PH.

2. METHODOLOGY

2.1. Participants and setting

A total of fifty-five ($n=55$) crew members from three off-shore companies took part in the study. Data collection took place between November 2019 to July 2020. There were only less than 40 individuals in each platform while average number of crew members in shipping vessels was 17. Due to the small sample size, data normality was tested with Shapiro-Wilk test (Etikan & Bala, 2017).

Onshore coordinators in Manila and Batangas Port were appointed to handover questionnaires to medics or managers who then distributed the survey kits to their crew. The study participants' inclusion criteria consisted of crewmembers within 21 to 64 years old who understood English/Filipino and were working on the data collection dates. However, the crewmembers who were on vacation had a chance to participate once arrived on board. Third-party contractors who are working for short-term projects were considered ineligible for the study. After obtaining ethics approval from management, the study was introduced among the groups in safety meetings. The crewmembers had ten days to fill-out the survey forms and a small token was given once completed. The proponent's e-mail address and mobile number were given if they have clarifications on the items.

The study was done in natural gas field platforms and two shipping vessels that supply materials to the latter. The installations were located 50 km off the coast of Palawan. The two ships are modified remotely operated underwater vehicles (ROV)/construction support vessels that travel to and from the natural gas fields, Batangas and Manila ports to procure materials for platform operations.

2.2. Measurements

The vital exhaustion levels were assessed using the 21-item MVEQ (Appels, Höppener & Mulder, 1987). The scores obtained from the 21-item MVEQ range between 0 to 42, assuming that the higher the score the higher the VE level was. The cut-off score between exhausted and non-exhausted subjects is considered 17. Validity and reliability tests on this tool showed a Cronbach's alpha of 0.83 (Meesters & Appels, 1996). The scores per question were coded as 0 for "No", 1 for "Don't Know" and 2 for "Yes", with the exemption of questions 9 and 14 that were reversed coded.

The Copenhagen Psychosocial Questionnaire (COPSOQ) III was utilized to determine PH. COPSOQ is an internationally recognized instrument that can be used in majority of work settings as a risk assessment tool. PH is a broader outlook on someone's health and quality of life depending on the psychosocial factors or risks dealt with in the workplace. By this operational definition, COPSOQ III which was released in July 2018 was used to describe the PH of workers onboard. Five main dimensions comprise the COPSOQ questionnaire such as "Demands at Work", "Influence and Development", "Interpersonal Relations and Leadership", "Further Parameters" and "Outcome Scales". (Nübling et al, 2006; Nübling & Hasselhorn, 2010; Burr et al, 2019). It also included the dimension of "Physical Work Environment". To reduce the response burden among subjects only 31 "core" items were taken from COPSOQ III. Majority of the items listed in the COPSOQ III can be rated in a Likert scale with five response options (Always, Often, Sometimes, Rarely and Never/Almost Never). Each of the choices corresponds to an assigned value (0, 25, 50, 75 and 100, respectively). There was only one scale with four choices which is work life conflict. In this case, each option was scored 100, 66, 33 and 0 respectively.

Thus, a high score on job satisfaction means a high satisfaction rate while a low score on influence means a low level of influence at work. In most cases high levels are "good" or "healthy". The exceptions are quantitative demands, work pace, emotional demands, role conflicts, job insecurity and work-family conflict. Reliability scores of each scale can be found in an evaluation study of COPSOQ done by Nübling and his team in Germany (2006). Two items regarding work environment/safety were added from the "beta" version of COPSOQ III (OHCOW, 2018) and four questions under conflicts and offensive behavior were also included. Questions on work environment/safety were added to show if workplace conditions and safety concerns are addressed properly. Items under conflicts and offensive behavior tackle issues on sexual harassment, violence and bullying among workers.

Split shifts every two weeks and weather conditions in the time of data collections were some extraneous variables considered.

2.3. Statistical analysis

This research adopted a quantitative non-experimental descriptive correlational design. A quantitative research approach is considered a well-established research design, that relies on the collection and analysis of numerical data to describe and establish relationships between variables and sometimes to attempt to explain causal relationships between variables on the phenomenon (Campbell, M., 2016., Creswell, 2005; Fraenkel et al., 2012). The combination of survey research (this is, through standardized instruments) and the correlation research design aimed to describe and investigate the nature of relationships or associations between variables (Fraenkel et al., 2012). No treatment or intervention was done in this study. Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) v27.0 software program.

2.4. Ethics approval

Ethics approval was obtained from the University of the Philippines Open University (UPOU) Ethics Board and the management of the respective vessels. Data was gathered with the written consent of the respondents. The participants were fully informed about the aim of the study and voluntarily fulfilled the survey questionnaires anonymously. All the participants provided written informed consent and all the information obtained was held strictly confidential. There were no significant risks from participating in this survey and when a respondent felt uncomfortable answering any of the questions in the form it was left blank. The respondents were given the option to leave the research study at any time.

3. RESULTS

Table 1 shows the socio-demographic profile of the respondents working in the platform and cargo vessels. There was a single female respondent (1.8%) in this male-dominated industry (98.2%). The mean age of the group was 42.7 years old and more than half of them belonged in the 41-60 age bracket (61.8%) while the remainder were in the 20-40 age group (38.2%). The majority of them have a bachelor's degree (69.1%) and the rest were undergraduates (30.9%). Roughly half of the respondents (49%) have been working off-shore for 11-35 years and the average tenure was 11.7 years.

Most of the respondents are working under the maintenance and marine departments (30.4%) followed by those assigned on deck duties (28.6%). Only a few of the crew are working in the catering department (7.1%) and there was single third-party crew member (1.8%) in the survey. Deck and maintenance crew members are mainly involved in doing physical tasks (58.9%) followed by client and management personnel in charge of clerical and decision-making activities (30.4%). A few of the respondents are assigned in both mental and physical tasks (8.9%).

Table 1. Characteristics of the off-shore participants (n=55)

	N	%
Gender		
Female	1	1.8
Male	54	98.2
Age distribution (years)		
20–40	21	38.2
41–60	34	61.8
Education		
Undergraduate	17	30.9
Bachelor's degree	38	69.1
Tenure		
Less than 5 years	9	16.4
6 to 10 years	19	34.6
11 to 35 years	27	49.0
Job assignment		
Deck Crew	16	29.1
Maintenance	17	30.9
Marine Crew	17	30.9
Catering	4	7.3
Third Party	1	1.8
Work type		
Physical	33	58.9
Mental	17	30.4
Both	5	8.9

Table 2 shows the VE scores of the respondents. Each item was added together to obtain the total VE level. The mean total score of 5.25 is way below the cut-off point of 17 set to mark VE. This indicates that off-shore workers have exceptionally low feelings of fatigue, hopelessness, listlessness and irritability. The mean score of each question also suggests that workers have little to no symptoms of VE as evident in the majority of "YES" responses in the item "Do you feel fine?" (M= 0.182, SD= 0.580). The small standard deviation indicates a small variation of scores between off-shore workers.

Table 2. Mean rating scores of MVEQ questions of off-shore personnel

Item No.	Question	Mean	SD
1	Do you often feel tired?	.364	.778
2	Do you often have trouble falling asleep?	.400	.807
3	Do you wake up repeatedly during the night?	.400	.807
4	Do you feel weak all over?	.182	.580
5	Do you have the feeling that you haven't been accomplishing much lately?	.255	.673
6	Do you have the feeling that you can't cope with everyday problems as you used to?	.127	.474
7	Do you believe that you have come to a "dead end"?	.236	.637
8	Do you feel most listless or lacking energy lately?	.182	.580
9	Do you enjoy sex as much as ever?	.527	.858
10	Have you experienced a feeling of hopelessness lately?	.109	.458
11	Does it take more time to grasp a difficult problem than it did a year ago?	.255	.673
12	Do little things irritate you more lately than it used to?	.145	.524
13	Do you feel you want to give up trying?	.109	.458
14	Do you feel fine?	.182	.580

Item No.	Question	Mean	SD
15	Do you sometimes feel that your body is like a battery that is losing its power?	.545	.899
16	Would you want to be DEAD at times?	.055	.299
17	Do you have feeling these days that you just don't have what it takes anymore?	.109	.458
18	Do you feel sad and depressed?	.109	.458
19	Do you feel like crying sometimes?	.400	.807
20	Do you ever wake up with a feeling of exhaustion or fatigue?	.255	.673
21	Do you have increasing difficulty in concentrating on a single subject for long?	.309	.717
Overall Mean (ranges from 0-2)		.250	.317
Mean Total Score (ranges from 0-42)		5.25	6.66

To obtain the PH level of the respondents, the mean and standard deviations of the five dimensions were computed. Table 3 shows the mean and standard deviation of the individual COPSOQ questions to identify where the off-shore workers scored high or low in. The average mean score is also presented per scale.

Table 3. Mean rating scores of CORE COPSOQ questions of off-shore personnel with average score per scale

Scales/ Dimension	Question	Mean	SD
Demands at Work			
Quantitative work demands	Do you get behind with your work?	38.64	19.14
	How often do you not have time to complete all your work tasks?	35.46	22.92
Tempo, work pace	Do you have to work very fast?	52.73	19.65
	Do you work at a high pace throughout the day?	46.36	23.77
Emotional demands	Do you have to deal with other people's personal problems as part of your work?	40.91	25.17
	Is your work emotionally demanding?	33.18	31.57
Work-Life Conflict	Do you feel that your work drains so much of your ENERGY that it has a negative effect on your private life?	41.65	24.84
	Do you feel that your work takes so much of your TIME that it has a negative effect on your private life?	40.66	26.00
Average		40.91	14.15
Influence and Development			
Influence at work	Do you have a large degree of influence on the decisions concerning your work?	62.96	26.48
	Possibilities for development (skill discretion)	75.46	21.44
Meaningful work	Can you use your skills or expertise in your work?	81.94	19.68
	Is your work meaningful?	84.26	21.33
Average		76.16	16.61
Interpersonal Relations and Leadership			
Predictability information)	(sufficient) At your place of work, are you informed well in advance concerning for example important decisions, changes, or plans for the future?	69.91	19.06
	Do you receive all the information you need in order to do your work well?	77.31	15.56
Recognition	Is your work recognized and appreciated by the management?	65.91	22.75
	Role clarity	74.55	21.78

Scales/ Dimension	Question	Mean	SD
Role conflicts	Are contradictory demands placed on you at work?	38.64	27.14
	Do you sometimes have to do things which ought to have been done in a different way?	44.55	25.18
Quality of leadership	To what extent would you say that your immediate superior is good at work planning?	70.91	20.98
	To what extent would you say that your immediate superior is good at solving conflicts?	70.00	21.73
Social support from colleagues	How often could you get help and support from your colleagues, if needed?	74.55	20.69
Social support from supervisors	How often do you get help and support from your nearest superior?	73.64	21.74
Sense of community at work	Is there a good atmosphere between you and your colleagues?	82.27	15.72
	Does the management trust the employees to do their work well?	72.27	16.44
Trust and justice	Can the employees trust the information that comes from the management?	69.20	22.86
	Are conflicts resolved in a fair way?	69.55	19.66
	Is the work distributed fairly?	68.18	20.10
Average		68.08	11.60
Further Parameters			
Insecurity over employment	Are you worried about it being difficult for you to find another job if you became unemployed?	50.91	25.44
Insecurity over working conditions	Are you worried about being transferred to another job against your will?	43.64	28.55
Average		47.27	24.73
Outcome Scales			
Satisfaction with work- job satisfaction	Regarding your work in general. How pleased are you with your job as a whole, everything taken into consideration?	79.02	16.36
Overall health	In general, would you say your health is	73.21	22.29
Average		75.68	17.58
Physical Work Environment			
OHCOW additional items	How well environmental conditions are managed (air quality, temperature, lighting, noise, workstation ergonomics)?	78.18	26.81
	How well are safety concerns managed (slip/trips/falls, toxic chemicals, infectious diseases, Wi-Fi radiation, working alone)?	82.72	26.30
Average		80.45	26.55

Table 4 presented the interpretation key used to classify the average level of agreement for each statement derived from COPSOQ III to determine PH. A mean score obtained for every question for each of the five dimensions was compared to a rating scale to come up with a verbal description.

On average, off-shore workers get behind with their work ($M=38.64$, $SD=19.14$), have less time completing tasks ($M= 35.46$, $SD= 22.92$) and consider their job as emotionally demanding ($M= 33.18$, $SD= 31.57$) to a small extent. Similarly, personnel do not find their jobs interfering with their private lives in terms of energy ($M= 41.65$, $SD= 24.4$) and time ($M= 40.66$, $SD= 26.00$). Most participants regarded their work as meaningful ($M= 84.26$, $SD= 21.33$) and they can utilize their expertise ($M= 81.94$, $SD= 19.68$) to a large extent. Workers also reported enough learning opportunities ($M= 75.46$, $SD= 21.44$) and good working atmosphere with the rest of the crew ($M= 82.27$, $SD= 15.72$). Participants mentioned that they receive enough information ($M= 77.31$, $SD= 15.56$) and have clear objectives in their jobs ($M= 74.55$, $SD= 21.78$). Social support from

colleagues (M= 74.55, SD= 20.69) and supervisors (M= 73.64, SD= 21.74) was observed ensuring a smooth workflow onboard. A large extent of workers were also satisfied with the trust given by their management on their job performance (M= 72.27, SD= 16.44).

Table 4. Description of scale of the psychosocial health among off-shore workers

Scale	Rating Scale	Verbal Description
100	80.1 to 100	Always/ To a very large extent
75	60.1 to 80.0	Often/ To a large extent
50	40.1 to 60.0	Sometimes/Somewhat
25	20.1 to 40.0	Seldom/ To a small extent
0	0 to 20.0	Never/Hardly ever/To a very small extent

Off-shore personnel are somewhat anxious about prospects of finding a new job if they get laid off (M= 50.91, SD= 25.44) and the possibility of being transferred to another task or department (M= 43.64, SD= 28.55). Just recently, oil and gas exploration projects were re-opened by the Philippine government to foreign investors in which could lead to more job prospects and projects for off-shore personnel in the country (Gomez, 2020).

A large extent of workers were satisfied with their jobs (M= 79.02, SD= 16.36) and overall state of health (M= 73.21, SD= 22.29). Environmental (M= 78.18, SD= 26.81) and safety concerns (M= 82.72, SD= 26.30) are kept to a minimum with well-designed/controlled systems.

Conflicts among employees are resolved fairly (M= 69.55, SD= 19.66) and work is distributed equally (M= 68.18, SD= 20.10) among crew members often. Few of the participants reported issues such as undesired sexual attention, threats of violence and bullying in the past year. The management has an open-door policy and ethics helpline where employees can air their concerns regarding work conflicts and offensive behavior.

Due to the small sample size, a test for normality (Shapiro-Wilk) was conducted before measuring the association of variables. Results showed that the sample was non-normal. Hence, Spearman's rho correlation was used to test the relationship between variables. The values in the second column of Table 5 show the strength of association between VE and PH dimensions. Cohen's (1992) interpretation of the absolute value of the correlation (r) was used to describe if the association is either weak, moderate, strong or very strong.

Table 5. Coefficients (p-values) of Spearman's rho correlation between vital exhaustion and psychosocial health among off-shore personnel

Psychosocial Health Dimensions	Vital Exhaustion	
	P	p-value
Demands at Work	.640	<.001
Influence and Development	.296	.080
Interpersonal relations and leadership	.409	.001
Further Parameters	.429	.001
Outcome Scales	-.482	<.001

*p-values less than .05 are considered significant

The Spearman correlation ($\rho = .640$) shows a strong uphill (positive) linear relationship between the perceived VE levels and work demands of the off-shore workers. The Spearman correlation ($\rho = .409$) also shows a moderate uphill (positive) linear relationship between the perceived VE levels and the interpersonal relations and

leadership of the off-shore workers. The Spearman correlation for the Further Parameters and VE ($\rho = .429$) shows a moderate uphill (positive) linear relationship. Lastly, the Spearman correlation ($\rho = -.482$) also shows a moderate uphill (negative) linear relationship between the perceived VE levels and the Outcome Scales of off-shore workers.

On the other hand, the third column from Table 5 showed that at a 5% level of significance, there is a significant relationship among four PH dimensions and the VE level of off-shore workers except for the Influence and Development domain.

Table 6 presents the coefficients (p-values) of the Chi-square tests to determine whether there is a significant association between VE and demographic profile at 5% level of significance.

Table 6. Coefficients (p-values) of Chi-square tests between vital exhaustion and socio-demographic profile of off-shore personnel

Mean Total Score of Vital Exhaustion * Demographic Profile	Chi-square Test	
	Value	p-value
Age	17.09	.195
Educational Level	14.02	.448
Tenure	32.83	.242
Job Assignment	96.43	.020
Work Type	72.94	.002

*p-values less than .05 are considered significant

There is sufficient evidence to conclude that that job assignment and work type of off-shore workers and their VE have a significant relationship. This may mean that those profiles of off-shore workers have a significant effect on the increase/decrease of their VE levels.

Table 7 presents the coefficients (p-values) of the Chi-square tests used to determine whether there is a significant association between PH and demographic profile at a 5% level of significance.

Table 7. Coefficients (p-values) of Chi-square tests between psychosocial health and socio-demographic profile of off-shore personnel

Mean Dimension Score	Age	Educational Level	Tenure	Job Assignment	Work Type
Demands at Work	37.68 (.158)	36.40 (.232)	62.39 (.462)	152.06 (.552)	69.50 (.967)
Influence and Development	12.93 (.227)	8.24 (.605)	26.32 (.156)	58.66 (.188)	36.20 (.202)
Interpersonal relations and leadership	29.01 (.220)	30.18 (.218)	59.10 (.177)	100.09 (.951)	68.76 (.681)
Further Parameters	9.25 (.322)	6.81 (.557)	20.99 (.179)	34.28 (.725)	13.23 (.962)
Outcome Scales	5.82 (.561)	4.61 (.547)	16.29 (.296)	22.00 (.957)	17.24 (.697)

*p-values less than .05 are considered significant

There is insufficient evidence to conclude that the demographic variables of off-shore workers have a significant relationship with any of the dimensions of PH. This may mean that their profiles have no significant effect on their PH.

4. DISCUSSION

Limited or no literature is available to compare the demographic profile of this group to oil and gas workers in the Philippines however a study done among 1,248 Filipino seafarers in the domestic shipping industry (Anchustegui, 2011) and an investigation among 1,026 seafarers from 24 flag states that dock in Australian ports (Andrei et al., 2018) resemble the demographics of the group in this research.

Low VE levels provide a good assessment of the crew's mental health. The all-Filipino composition of the personnel is a good contributor to low VE levels because they developed a strong bond as a group. Language barriers are lesser and most share similar cultural references. Filipinos are generally cheerful and resilient workers. Filipino seafarers ranked the most satisfied group by nationality serving onboard ships (n=9,768) in a survey. They were also the largest group serving cargo ships with several years of experience. The proponents assumed that there was a correlation between nationality and happiness onboard because significant difference was observed on the wellness levels of Filipino seafarers (87.4%) with other nationalities (Seafarers, 2020). Their team-building spirit is also prevalent, and stressors are dealt with accordingly through dialogue, management support and participation in health-related activities. Also, feelings of isolation are lesser compared to off-shore workers assigned internationally. After a month-long rotation they can easily go back to their home provinces. The VE levels of Filipino off-shore personnel mirror the VE levels of employees in two European aircraft manufacturing plants where majority of participants show none or mild to moderate levels of VE (Preckel, 2005).

There is a significant correlation between VE and four PH dimensions. An increase in perceived level of VE is correlated with an increase in work demands and feelings of job insecurity and vice versa. These findings are congruent with the observations of Schoch and her group in their investigation regarding the effects of stress in men aged 40–75 years. They ruled out that VE was positively associated with work-related stress, specifically work overload, excessive demands at work, and work discontent (Schoch et al., 2018). Another research done among off-shore workers assigned in the North Sea and Southeastern Asia corroborates with the outcomes of this study. Proponents elucidated that seafarers with high psychological demands and who conceived organization climate negatively reported more physical fatigue. Interestingly, their results on employment status yielded similar associations with the responses from the subjects' job insecurities in this study. They discovered that employment status significantly predicted fatigue in all three dimensions. Compared with seafarers with permanent employment, temporary workers reported significantly more physical and mental fatigue, as well as lower levels of energy (Hystad et al., 2013).

A study regarding 537 healthy men (86%) and women (14%) working in a Swiss airplane manufacturing industry mirror the association of VE and PH when it comes to demands at work. Using the nine-item MVEQ, workers tend to have higher VE levels (score >10) when exposed to heavier workload or qualitative demands. The team also found out that employees that have high social support from their coworkers were three times less likely to have elevated VE scores as compared to those with poor social support (Schnorpfeil et al., 2002).

There is a disconnect with the statistical results gathered when comparing VE and interpersonal relations and leadership. Lower level of VE is expected when social support from colleagues and superiors are high as what was observed in a Men Stress 40+ study. Subjects with severe VE reported the lowest levels of social support whereas those with support-seeking behavior and perceived social support have lower levels of VE (Noser et al., 2012). Most of the workers (90.7%) in this study are aware of the health campaigns implemented by their respective managements and find them effective (77.8%) in addressing their mental and physical health onboard. Bullying exists in off-shore locations however it is not widely discussed. It is not an issue among Filipino seafarers in this study but other researches abroad reveal that almost 50% of seafarers have personal experiences of bullying, discrimination and harassment at sea (Martek Marine, 2017).

A decrease in perceived VE level is correlated with increase in well-being of employees at the workplace. Results align with the job satisfaction rates reported by off-shore oil and gas platform employees in East Malaysia (n=214) (Harun et al., 2014) level of well-being among 1026 seafarers docking in Australian ports (Andrei et al., 2018) and self-rated health of 1572 seafarers from various origins and vessels (Lefkowitz & Slade, 2019).

An off-shore worker's job assignment translates to the type of work he does onboard which explains its correlation to VE level. It can be observed that personnel assigned in deck and maintenance jobs doing mainly physical tasks reported higher levels of VE than those designated in the marine department assigned for mental tasks. The results indicate that work types may be considered as a significant predictor variable for VE, as work types predicted perceived exposure to physical stressors (physical tasks). Also, the profiles of perceived job characteristics were influenced by the different job assignments. Manual or physical labor is associated with repetitive movements, awkward postures, heavy lifting at times that causes musculoskeletal strains in different parts of the body and fatigue over time as manifested by subjects in a US Navy aircraft carrier. Participants with musculoskeletal (MSK) symptoms showed increased levels of fatigue and report shorter duration of nighttime sleep as compared to crew members with no MSK symptoms (Shattuck et al., 2016).

The PH levels of the crew did not have a significant correlation across all demographic variables in the study because majority of them find their work satisfying, their efforts are recognized and they receive enough social support. The findings of a study among various Canadian labor market participants support the results of this research where demographic variables did not correlate with PH. They discovered that quality of leadership and social support from supervisors, and vertical trust and organizational justice were always relevant among the respondents regardless of sex, gender role, or age. Other subscales like predictability and rewards, meaningful work and commitment to the workplace were highly associated with psychological health and safety across demographic subgroups (Ramkissoon et al., 2019). A study among Turkish seafarers yielded opposite results when it comes to age of the crew. They claim that as workers age, their intention to leave decreases, job satisfaction increases, and burnout decreases. They also mentioned that as the working conditions of off-shore workers get rough, intention to leave occurs. The department where a worker is assigned has a major impact in his job satisfaction and burnout (Tavacıoğlu et al., 2019).

5. CONCLUSION

This is an initial study of the VE and PH of off-shore workers in the Philippines where favorable outcomes were derived. The findings indicate that high VE levels and poor PH are not pressing issues at the time of data collection. Preventing the occurrence of these conditions in the future is important for the well-being of crew members.

The advent of the COVID-19 pandemic has made a compounded impact in the ongoing layoffs of off-shore workers worldwide due to contract suspensions and flight restrictions limiting crew movement from their origin countries to work destinations. Majority of off-shore workers spend more time at work than with their families and some need to stay onboard for extended periods. It is imperative that healthcare professionals and off-shore management monitor the mental health of their staff through the conduct of individual interviews, group discussions and formal surveys.

In the Philippines, occupational health nurses (OHNs) play a major role in the implementation of Republic Act No. 11058 or an Act strengthening compliance with Occupational Safety and Health Standards Act (DOLE, 2018). They act as bridges between workers and management since they have direct contact among personnel who rely on them for support and guidance. An OHN is an invaluable member in off-shore environments because they can contribute in the creation, review and update of policies on stress reduction. They are well-aware of the job characteristics and psychosocial hazards of workers and by listening, counselling, and assessing the readiness of

employees to return to work. They can help companies design and execute stress management programs (O'Keefe et al., 2014).

Some limitations of this research include the cross-sectional nature of the data and limited number of participants. Further studies with more subjects are suggested to make findings generalizable. Results may vary if more nationalities are involved. Maritime work settings normally involve personnel from different countries and the role of culture, training, safety climate, and other biases may reveal a better idea on how VE affects the PH of their workers.

Overcoming stressors posed by numerous work demands, shift work, organizational changes, shortage in staffing and workplace violence can only be achieved through effective implementation of stress prevention programs and cooperation across all departments.

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