

The C.O.P.E. Typology of Coping with Stressors at Sea among Filipino Merchant Marine Ratings: A Q Methodology Study



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ABSTRACT

Background: The seafarers' poor mental health has been associated with significant morbidity, inefficiency, and accidents on board. Mental and physical health is largely dependent on the way seafarers handle stressors.

Anchored on the Transactional Model of Stress and Coping, this study aimed to identify the typology of Filipino merchant marine ratings according to their coping strategies to stressors on board vessels.

Methods: Thirty-seven (37) Filipino merchant marine ratings participated in this study. They were chosen by purposive sampling. They rank-ordered 25 opinion statements on various stressors and coping mechanisms. The rank-ordered sorts were subjected to by-person factor analysis with Varimax rotation using the PQ Method version 2.32. The resulting factors were interpreted using the inductive approach, aided by the interview done after Q sorting.

Results: Four factors were generated: solution-focused seafarers, stressor-focused seafarers, self-management-focused seafarers, and the social milieu-focused seafarers. There is a consensus on the supplication-focused seafarers who ask for God's help in times of stress.

Conclusion: The generated typology provides a better understanding of seafarers' outlook on stress and coping and may help the stakeholders craft individualized strategies to help improve their coping mechanisms and overall mental health. Occupational health research must continue to focus on understanding the role of culture and adaptation on stress and coping behaviors to retain quality seafarers and promote a healthier workplace.

Key words: coping mechanisms, merchant marine ratings, Q methodology, seafarers, stressors

INTRODUCTION

The Philippines is the leading source of merchant marine ratings serving the world merchant fleet according to the BIMCO Manpower Report (BIMCO 2015). [1] Filipinos are particularly attracted to seafaring because of the financial stability that it brings. However, seafaring is a high-risk profession as stress abounds and is inevitable. The stressors were broadly described as chemical, physical, biological, as well as psychological/psychosocial. [2,3] The significant toll on physical and mental

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health that these stressors cause are inevitable[3-5] but variable as the transactional model of stress and coping suggests.[6]

Seafarers' stressors stem from a myriad of interrelated factors. Foremost among them is globalization which increased trade volume, heightened competition in the international market, and spurred technological innovations. Strong competition and high trade volume resulted in faster turnaround schedules in ports.[7] These resulted in a loss and lack of sleep, seafarer fatigue[8-13], and lack if not loss of shore leaves.[13,14] Technological innovations like computerized systems in the engine room and on the bridge challenged seafarers to step out of their comfort zones and learn new skills.[12,15,16] The potential down-sizing of crew that these technological changes bring[15] are perceived as a threat of impending redundancy or early retirement which the seafarers judged as moderately stressful.[12]

Seafarers also live for months on end in the small confines of a ship. Tension in a closed group of people and onerous physical conditions of work like rocking, vibrations, noise, changes in climate, and time zones contribute to their stress.[2] On the extreme were mental and physical overloads associated with performing work in difficult weather conditions like storms[5] and loss of sleep, especially with longer duration of work at sea.[17] The long months on sea duty also give rise to prolonged separation from family and friends,[18] considered by Filipinos as highly stressful.[12] These prompted recommendations to improve telecommunication on board. [19] Digital technology on board decreased the homesickness of seafarers albeit fragmented in some respects.[20] While internet accessibility promoted satisfaction and health,[21] it can bring a different kind of stressor as simple family problems come to their knowledge and engender worries and anxieties [22] that derail them from their focus on work. There is also a loss of close relationships and camaraderie of coming together after work or after meal time as these were replaced by the cellular phones, tablets, and laptops.[23]

Studies on stressors are important because of its association to mental health. Iversen emphasized that stressors on board result in anxiety and depression, and for some, suicide.[13] While studies on stressors draw attention to the physical, social, and psychosocial problems on board and has brought to the fore recommendations like the

need for more socialization and shore leaves and the importance of an equal and fair work environment, [14] a more holistic approach would be to study these in relation to coping. If this job is so stressful, how can a significant number have a successful career as seafarers, spending years of their lives away from home? How did they cope? There is a paucity of studies combining stress and coping among seafarers and the use of Q methodology. E. Gregorio (2012) studied stress and coping among Filipino seafarers using phenomenology.[24] Oliver (2017) used Q methodology but the study focused on shared viewpoints about motivations, expectations, work attitudes, and social relations on board the working lives of Filipino cruise ship employees.[25]

This study was undertaken to bridge this research gap and provide an answer to the central question: "What are the typology of seafarers in terms of what they view as stress and the coping mechanisms they employ while on board vessels?" The implications in terms of addressing mental health issues will be drawn from the typology which may improve paradigms that promote seafarers' mental health.

Anchored on the Transactional Model of Stress and Coping, this study posits that mental health is a balance between stressors and one's coping mechanisms. By putting together, the stressors and coping mechanisms in a concourse and allowing the seafarers to perform a forceful ranking according to their perceptions, the typology and its implications to mental health can be derived. The Q methodology made this possible by making the concourse grounded on the model. A published work of Baqutayan provided a review of the various definitions of stress and coping mechanisms as well as a model that integrated the various coping mechanisms.[26] This framework combined the coping mechanisms forwarded by Lazarus and Folkman[6] and that of Carver and Weintraub.[27]

METHODS

Study Design

This study utilized a mixed methods sequential explanatory design using the Q methodology. [28,29] The concourse consisted of 25 statements generated from review of existing literature on stressors of seafarers and review of theoretical frameworks on stress and coping mechanisms. There were four categories of statements namely:

Table 1. Major Themes and Statements in the Q-Set

Themes		Statements
I	Stressors	2 My greatest stressor is fatigue from watch duty or too much work. 4 I am greatly stressed by poor sleep quality. 5 I am often depressed while on sea duty. 7 The work environment on the ship is not equal and fair. 8 I am not happy with my salary. 10 I feel discriminated by my superior. 11 Cultural diversities on board are stressful. 18 I am disappointed with the cutbacks on personal protection equipment, hotel accommodations and supply and quality of food. 21 My job is routinary and this makes it stressful. 22 Tension among crew gives me much stress. 25 I have health problems which could make me fail the PEME.
II	Emotion-focused Coping	3 I just laugh about the situation and humor myself and I feel better. 6 I admit to myself that I can't deal with it and quit trying 17 I restrain myself from doing anything too quickly. 23 I accept them and try to grow, mature, and become a better person because of the experience. 24 I meditate, pray, and seek God's help.
III	Problem-focused Coping	12 When I need to do so many tasks, I do the important things first and remove the not so important ones. 13 I concentrate my efforts on doing something about it. 14 I have a healthy lifestyle, and this helps me to cope and be ready for any problems/stresses that come my way. 16 I try to get advice from someone on what to do.
IV	Dysfunctional Coping	1 I turn to work or do something else to take my mind off things like the social media (Facebook). 9 I use alcohol to make myself feel better. 15 I tell myself; this isn't real. 19 I am often depressed while on sea duty. 20 I get upset and let my emotions out.

stressor statements, problem-focused coping statements, emotion-focused coping statements, and dysfunctional coping statements (Table 1).

Study Population

Thirty-seven merchant marine ratings, 24-60 years old, with mean age of 36 years, and average stay on board of 10.9 years were included in this study. They met the inclusion criteria of having worked on board the vessel for at least 1 year and were willing to participate in the study. Convenience sampling was used. All were able to finish the Q sorting.

The study was done in selected pre-employment medical examination (PEME) clinics from May-Aug 2019. They were waiting for the release/print-out of their PEME certificate when the consent was obtained

and the Q-sorting and interview were done. They were asked to Q sort 25 statements printed and cut into cards and randomly numbered.

The respondents were asked to sort the statements on the Q Sort Table (Figure 1) according to their degree of agreement (+4) or disagreement (-4) to the statements that answer the question, "While on shipboard duty, what are your major/significant stressors? What do you usually do when you experience a stressful event?" After the Q sorting, an interview followed to elucidate their most agreed (+4) and most disagreed (-4) statements and on what statements they would have wanted to be included in the Q sort. A debriefing followed, patterned after the "Debriefing Form for Participation in a Research Study" of the University of Massachusetts Amherst.[30] None of the seafarers were distressed by any of the statements.

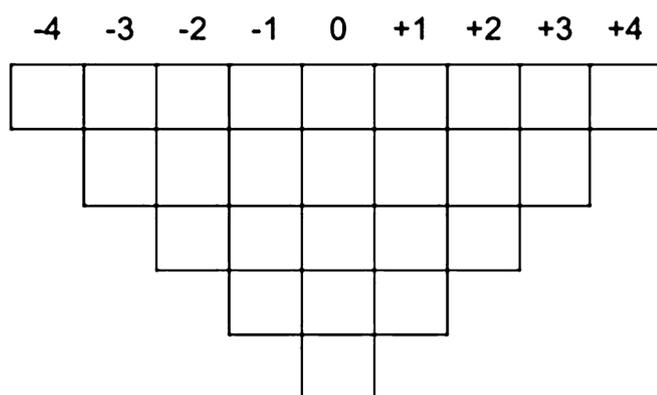


Figure 1. The Q Sort Diagram

The implementation of the study was undertaken by the research investigators. To eliminate bias, none of them performed it in their own clinics.

Data Analysis and Interpretation

The respondents’ Q sorts were entered into the PQ Method software version 2.32 that performed by-person factor analysis (centroid factor extraction) and rotation with Varimax. Factor analysis was used to correlate the respondents’ Q-sort, to identify which cluster was together. Principal component analysis was used to maximize the similarities within factors and identify differences between them. The factors were interpreted using the inductive approach to determine the prevailing themes. This was done by considering the characterizing statements. The distinctive statements defined as those with statistically significant different factor scores compared to all factors ($p < 0.05$), together with the anchors and phenomenal referents were used to determine the chief characteristics for each factor profile.[31]

Ethical Consideration

The study was conducted after the University of Santo Tomas Hospital Research Ethics Committee

approval (REC-2019-01-008-MD) was obtained and conducted in accordance with applicable guidelines like the Declaration of Helsinki 2013, WHO Operational Guidelines, International Conference on Harmonization (ICH) guidelines on Good Clinical Practice Guidelines (GCP), and the National Ethical Guideline 2017 Edition.

RESULTS

Table 2 shows the demographics of the participant marine ratings classified according to age and number of years engaged as a seafarer.

There were four factors generated from the sorting of 37 merchant marine ratings. The average relative coefficient was 0.80 with composite reliability of 0.92-0.98.

Table 3 lists the distinguishing statements of different factors from which the typology was generated by induction.

Factor 1: Solution-Focused Seafarers

Factor 1 refers to the Filipino Merchant Marine Ratings as the problem solvers. They focus their energy through a positive orientation as personified by the tack that enables them to navigate the changing wind directions through active engagement with the problem and finding solutions.

Seafarers in this typology employ problem-focused strategies, both seeking external help in the form of advice and actively doing something to alleviate and eliminate the stressor. They also harness the learnings that the stressors provide to improve and be ready for whatever stressors that may arise. They are satisfied with what they receive for their work.

Factor 2: Stressor-Focused Seafarers

Factor 2 refers to the Filipino ratings as focused on the stressors. They have a negative orientation as

Table 2. Demographics

Age in years			Years as Seafarers		
Age bracket	Number	Percent	Number	Percent	
20-30	15	40	1-10	51	33
31-40	7	19	11-20	13	45
41-50	11	30	21-30	5	20
51-60	4	11			

Table 3. Distinguishing statements for the different factors

Factor 1: Solution-Focused Seafarers	Q-SV	Z-SCR
I try to get advice from someone on what to do.	3	1.29
I concentrate my efforts on doing something about it.	3	1.29
I accept them and try to grow, mature and become a better person as a result of the experience.	2	1.17*
Tension among crew members gives me much stress.	2	-0.99*
I am not happy with my salary.	-3	-1.50
Factor 2: Stressor-Focused Seafarers	Q-SV	Z-SCR
My greatest stressor is fatigue from excessive workloads and reports.	3	1.68*
I turn to work or do something else to take my mind off things like social media (Facebook).	2	1.26
I feel discriminated by my superiors.	2	1.04*
I am greatly depressed by poor sleep quality.	2	1.04
Factor 3: Self-Management Focused Seafarers	Q-SV	Z-SCR
I accept them and try to grow, mature and become a better person as a result of the experience.	4	1.83*
I just laugh about the situation and humor myself and I feel better.	2	1.54*
My greatest stressor on board is being separated from my family.	-1	-0.78
I am disappointed with the cutbacks on personal equipment, hotel accommodations and supply and quality of food.	-2	-1.08
Factor 4: Social Milieu-Focused Seafarers	Q-SV	Z-SCR
My greatest stressor on board is being separated from my family.	4	2.19*
I am not happy with my salary.	2	0.68
I am disappointed with the cutbacks on personal equipment, hotel accommodations and supply and quality of food.	1	0.45

$P < .05$; Asterisk (*) Indicates Significance at $P < .01$. Both the Factor Q-Sort Value (Q-SV) and the Z-Score (Z-SCR) are shown.

personified by being constantly affected by the wind and the constant challenges to maintain direction. There is passive drifting and a lack of self-efficacy to confront the stressors.

These seafarers are keenly aware of their stressors – fatigue, excessive workloads, sleep deprivation, and discrimination by superiors. Their coping mechanisms are dysfunctional. They use mental disengagement and avoidance as they are geared towards warding off the thought through work and social media. Although the coping may be viewed as dysfunctional, if the stressors are analyzed, it may be the best that can be done, given the circumstances. Interestingly, while their work is their source of stressors, it is also their balm.

Factor 3: Self-Management-Focused Seafarers

Factor 3 refers to the Filipino Merchant Marine Ratings as focused on self-management and self-enhancement. They have a positive orientation

as personified by the keel that provides stability. This typology leads to personal assertiveness that engenders grit and resilience in the face of stressors.

These seafarers use positive reinforcement and growth as their coping mechanisms. They also use humor to cope. These are both emotion-focused coping strategies. It is no wonder that no stressor predominates in the sorting as they are “accepted”. For them, the stressors are the healthy impetus to becoming a better person. One seafarer said, “I want to become a better person to learn some other things, to develop your maturity as a person and good person.” “I try to learn to accept the stressor and try to learn from my mistake and try to grow from them.”

Factor 4: Social Milieu-Focused Seafarers

Factor 4 refers to the Filipino Marine Ratings as focused on the social milieu at sea. Sorely missing

the familiar support of family, he has a predominantly negative orientation as personified by wallowing in self-pity amidst the expansive sea of stressors. This typology portrays emotional desolation.

These are the typical seafarers, stressed by being away from their family and conscious of what they have lost and of what distance has wrought, as one respondent verbalized, *“I chose this (statement) because I am not part of most of their memories and during vacation, they are aloof because they do not recognize me, especially when they were very young.”* The dissatisfaction with the salary can be related to the strong family concern and needs.

Consensus Statements: Supplication-Focused Seafarers

The Filipino Merchant Marine Ratings’ consensus statement resonates with a positive orientation towards God as the anchor that provides grounding when lowered, while allowing a new journey to commence amidst all challenges in life once the anchors are raised (anchor aweigh).

The respondents’ verbalizations exemplify this typology: – *“I meditate, pray and seek God’s help.”* This reflects the deep faith and trust in God that is typical of Filipinos. This is the typical coping mechanism that the Filipino seafarer employs. *“In everything else, stay calm and do not forget to pray, so that God will guide you through everything;” “To be safe every day because our work is prone to dangers and accidents;” “Of course, God first, to be safe from squabbles and dangers. He is my way and guide every day.”* For the Filipino seafarer, the meaning of life is GOD.

Table 4 summarizes the different factors according to center, orientation, persona, and essence (C.O.P.E).

DISCUSSION

Coping mechanisms are ways in which external or internal stress is managed, adapted to, or acted upon. Susan Folkman and Richard Lazarus defined stress as *“a product of a transaction between a person (including multiple systems: cognitive, physiological, affective, psychological, neurological) and his or her complex environment”* while coping as *“constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing”*. [6]

This study echoes the commonly identified and reported stressors but more than identifying them, it painted the persona of seafarers as a product of the rich interplay of what they view as stress and how they cope with it. The typology pictures the gradation of coping that the seafarers possess.

Implications of the Typology to Mental Health

The solution-focused seafarers are engaged in “proactive coping”, aimed at ensuring a successful encounter with a future stressor. In the context of the salutogenesis model of Antonovsky,[32] they have a strong sense of coherence and embody the characteristics essential for effective tension management. This is manifested in the way they try to understand the problem (comprehensibility), manage and solve it, or ask for help (manageability). They capitalize on the strength and growth opportunity

Table 4. C.O.P.E typologies of coping among Filipino Merchant Marine Ratings.

Center (Focus)	Orientation	Persona	Essence
Solution	Positive	Tack as mindset enables changing the direction by turning the bow of the boat through the wind	Active engagement
Stressor	Negative	Bearing away from the wind that provides constant challenges to maintain the course	Avoidance coping
Self	Positive	Keel within oneself provides stability and engenders grit and resilience	Personal assertiveness
Social Milieu	Negative	Sea as the social milieu to which they must constantly interact	Emotional desolation
Supplication	Positive	God as Anchor provides the grounding when it is lowered down and represents entering a new life journey when it is raised	Religious grounding

that the stressor provides (meaningfulness). They can be an effective social support to other seafarers. Social support fosters not only mental health but physical health as well.[36] The provision of positive social support will certainly help build psychological resilience in those who are not in possession of these qualities.

The stressor-focused seafarers need help. They resort to social media and work to help them cope. They use task-oriented avoidance coping [33] with distraction as a response to a stressor. In the COPE scale, this is termed mental disengagement [34] and is at the negative end of the problem solving - problem avoidance dimensions of "The Coping Circumplex Model".[35] This coping style stems from the belief of inadequacy to meet and control the stressor.[36] Various types of support like stress management interventions, a venue where the stressors can be aired and addressed (instrumental support) and social support through a close association with an identified solution-focused seafarer may help address problems and improve coping.

The self-management-focused seafarers are as well adapted as the solution-focused seafarers, but the focus is on improving themselves. The resolution of stress is not so much as getting rid of it but in using it to make themselves better persons. Stressors are therefore seen as challenges, not burdens. This has been termed "stress-related growth" described as a "dispositional response to stress that enables a specific individual to see opportunities for growth as opposed to threat or debilitation".[37] They are engaged in "proactive coping" because the response is aimed to prepare them for future stressors.[38] Thus, the stressor-focused seafarer may also benefit from a close association with this type of seafarer.

The social milieu-focused seafarers depict the role of social relationships in mental health.[39] The internet can bring them close to their family and may help prevent feelings of desolation and isolation. Feelings of social isolation must be prevented as these may lead to psychological and physical disintegration.[39] Scheduling a time each day to connect with family and friends through a phone or video call will be beneficial. However, he must be drawn into the mainstream of life on the ship (social integration), so that he can find a surrogate family and support. Opportunities for social interactions must be planned and provided regularly. They must also be equipped with other strategies like self-

soothing strategies, mindfulness activities, and using positive self-statements. It helps that many ratings on board a ship are Filipinos, and they can find solace in intracultural coping.

Stress is often viewed as an inevitable part of life at sea.[40] The consensus statement, "I meditate, pray and seek God's help", speaks highly of the deeply spiritual culture of Filipinos. It supports the role of port chaplains in providing welfare for seafarers.[41] All the typology look to God for help, mercy, and guidance. Deeply aware of a turbulent life at sea, they still pursue this career because they believe that there is a God they can turn to and who will never fail them. All of them used faith and faith-based coping strategies to help them meet challenges. Most of the respondents interviewed in this study sought relief from stressors by turning to their religions. Many of them expressed the strength of prayer to help them get through difficult times.

Implications to Human Resource Management

The reported typology has important human resource implications (Table 5). This is especially true for ratings which are new or still adjusting to life at sea. The typology highlights differing needs of seafarers to be able to cope but they also bring out how others successfully cope. Administrators should encourage the adoption of culturally appropriate interventions without losing sight of their typology-specific needs.

Implications for Future Research

The typology can be used to generate individualized or personalized health-promotion interventions geared towards mental health. Implementation and outcome of such interventions can be used as subjects of future research. The prevalence of the typology can also be studied.

CONCLUSION

A typology for seafarers according to their stress and coping mechanisms was generated. This typology can be a tool to better understand a seafarer's outlook on stress and coping and may help the concerned parties craft individualized strategies to help improve their coping mechanisms and overall mental health. Occupational health research must continue to focus on understanding the role of culture

and adaptation on stress and coping behaviors to be able to retain quality seafarers and promote a healthier workplace.

Limitations of the Study

This is a Q methodology study that aims to bring out typology but does not give the prevalence of the typology in the general population of seafarers. Such prevalence is better studied using surveys with random sampling. However, it brings to the fore the importance of subjectivity when studying stressors

and coping and how subjectivity can be viewed objectively using the Q method.

Conflict of Interest

All the investigators declare no conflict of interest. This study did not receive any grant.

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