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Maritime industry safety risks: fatigue and poor sleep

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Dear Editor,

We read with interest the article "Regulating seafarers' welfare: an examination of the protection of Filipino seafarers' well-being through a legal analysis of the POEA-Standard Employment Contract" by Pia and colleagues [1]. As advocates of public safety, we applaud them for highlighting the systemic problems leading to heavy workload, minimal rest periods, stressful situations, and fatigue among seafarers which negatively impact on seafarers' physical and mental health, decreasing their alertness, impairing decision-making, and increasing risk of errors and accidents.

Recent maritime accidents underscore the need to raise awareness of sleep and fatigue-related elements while at sea. Fatigue and complacency were found to be the cause of one of the latest marine incidences involving the Washington State Ferry structure. *Ava Claire* struck the Leland Bowman Lock gate, resulting in $2.5 million in damage [2]. The collisions in 2017 of the USS John McCain and USS Fitzgerald merchant ships resulted in the loss of seventeen sailors' lives. Fatigue was noted to be a component in both collisions by The Department of the Navy.

While fatigue in the transportation industry is not a new safety issue to address, it perhaps has been marginalized in the industry with the infrequent but impactful incidents at sea. Also, there is scant data regarding these accidents to objectively determine all the contributing factors at play. Yet, the British Marine Accident Investigations Branch found that nearly every accident can be attributed in some part to human behaviors resulting from the effects of sleep deprivation [3].

Unlike land-related transportation counterparts, maritime is governed by a different set of rules regarding sleep within the crew. In 1921, sea and land-based workers were split and since that time, the standards for sea workers have been under the Maritime Section and the Joint Maritime Commission [4]. Current International Maritime Organization regulations mandate the following: a minimum of 10 hours of rest in any 24-hour period, the rest period can be divided into no more than two periods (one must be at least 6 hours in length), and 77 hours of rest in any 7-day period. The regulation permits deviation/exemptions in the "case of emergency or drill or in other overriding operation," providing significant room for interpretation.

To have optimal focus and performance, people need about 8 hours of sleep per day, which many marine schedules do not allow. Studies have shown that mariners sleep less than 8 hours [3]. Additionally, studies on mariners have found that regulatory compliance is poor with significant differences observed in the recorded hours of work and rest [5].

The current maritime regulations and work culture do not support adequate sleep, which can lead to fatigue-related accidents. As economic demands increase and crew sizes continue to decrease, knowledge of maritime regulations and fatigue mitigation measures at sea are critical. Scheduled naps to recover from long shifts in sleep-conducive environments where light and noise are attenuated will address some fatigue-related conditions. Practical interventions such as scheduling by shift complexity and time on task, optimal schedules by resources can be considered after investigations of work-schedule needs and maritime employee sleep health are determined.

With the impact of the Maritime industry on worldwide trade and commerce, addressing ways to reduce fatigue

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and sleep-related difficulties is essential to minimize risks and advance safety.

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