LINKING LEADERSHIP INTEGRITY - DEPRESSION, ANXIETY AND STRESS (DAS) AMONG SAILING INDIAN MARINE ENGINEERS DURING COVID-19

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Abstract: Modern-day leadership demands competencies to embrace challenges and uncertainties as a part of a working career. Uncertainties bring in many unknown outcomes and a loss of direction to any team. This is much acknowledged when the unknown outcomes are affecting the team spirit and, in turn, organisational sustainability. Leadership integrity is a watershed to handle such uncertainties with positive outcomes. Like in any other business domain, uncertainties are part of the business in shipping. However, there are specific instances in the nature of COVID-19 that came with many challenges, like extended work contracts, no shore leaves, infrequent crew change, quarantine rules before sign-in, online surveys, etc. Such an uncertain and challenging work environment on board a ship (which itself is an organisation) results in anxiety, stress and depression. In this context, leadership integrity provides much-needed direction and can create a healthy work environment in any organisation. It is in this context that this paper tries to measure this hypothesis in an explorative study, particularly among active marine engineers who worked on board ships during the COVID-19 pandemic. Such knowledge facilitates the understanding of organisational behaviour during challenging times and provides a timely prescription for organisational success during uncertainties and challenging times with much significant focus on the integrity of leaders.

1.1 BACKGROUND

In the larger discourse on employee wellbeing, the concept of a sustainable workforce transcends boundaries that celebrate the mediocrity behaviour of employers towards employees' welfare. However, multicultural and diverse workforces have shifted the paradigm of discussion from employee engagement to the adoption of sustainable workforce models (Croitoru *et al.*, 2022; Mishra, 2020; Kossek *et al.*, 2014).

Conventionally, leadership is considered a source of inspiration and influences the motivation level among employees, which in turn facilitates their in-role performance on the job. Leaders with their emotional quotients have that connection, which could influence behavioural outcomes in employees. Leadership also affects employee engagement, job satisfaction, and autonomy of employees and may create a conducive work environment (Nyberg *et al*, 2005). Also, The much-romanticised role of a leader in the development of an organisation and the cohabitant relationship between leadership and the mental health of workers is much acknowledged in scientific literature. In this context, as pointed out by Vonderlin *et al.* (2021), job demands create a negative impact on the mental health of an employee because of the psychological efforts, physical efforts and social challenges that an employee is subjected to in order to perform at the workplace. Technological advancements, though, contribute towards the ease of performance of jobs, but when applied in the maritime industry, such advancements, combined with less manpower, result in fatigue and depression among seafarers (Russo et al., 2014). Adding to this are conflicts in the nature of hygiene factors like hierarchical disputes, defined roles, and abusive leadership. This leads to depression, anxiety and stress among employees. Further, these psychological ailments can lead to fatigue, sickness, absenteeism and, in some cases, premature retirement from the job. Therefore, the leader needs to read signs of psychological ill fits among employees (Pischel *et al.*, 2022).

Also, as pointed out by Jacobs (2019), ineffective leadership induces occupational stress among employees, which may lead to negative behavioural outcomes in employees. In this regard, attempts have been made in line with Cloutier and Barling (2023) to analyse the hypothesis that a leader's mental health and the mental wellbeing of workers are co-joint twins. In this context, scientific pieces of evidence support the common sense of awareness that leadership integrity plays a pivotal role in creating the organisational citizenship behaviour of employees (*Jung et al., 2020) and* employee behavioural outcomes. Simons (2002) defines leaders 'behavioural integrity' as mapping leaders' words with their actions. Therefore, a leader's role in terms of integrity, reflected in communication, promises and actions, facilitates workers retention and future engagement within the organisation. Also, such integrity of a leader is important to create trust among employees and is thought of as an inspirational attribute to employee engagement and productive contribution to the growth of the organisation (Choi *et al.*, 2002; Gutu *et al.*, 2023). A leader's integrity can be used as a heuristics that helps coworkers in predicting a leader's actions (Moorman and Grover, 2009).

Such prediction is very crucial in the context of uncertain situations which may stake conventional leadership styles. Uncertainties demand flexibility and do not suggest prescribed solutions. Uncertainties affect the mental health of employees directly negatively and lead to more anxiety, stress and depression (Massazza *et al.*, 2022) and thus demand integrity as a truism for effective leadership (Ete et al., 2022). Such integrity is so important in uncertain times, particularly when such uncertainty is a setback in the nature of the COVID-19 pandemic, which has an

immediate impact on the organisational work environment, employee health and engagement, employee behavioural and mental health outcome, and business continuity. The existing research focuses on leadership traits during uncertainties, but not much effort is put in terms of understanding the impact of leaders' integrity on employee welfare (specifically in terms of mental health effects) and behavioural outcomes, particularly during uncertainties like COVID-19. Such studies in the context of developing and emerging economies like India are further scanty. Moreover, sector-specific attempts to measure linkages between the leader's integrity and the mental health outcome of employees during uncertainties are even sparse. From the above discussion, the following research questions (RQ) emanate.

RQ_1: During uncertain periods, does the perception of subordinates on the integrity of their leaders impact the level of depression of the subordinates?

RQ_2: During uncertain periods, does the perception of subordinates on the integrity of their leaders impact the level of anxiety of the subordinate?

RQ_3: During uncertain periods, does the perception of subordinates on the integrity of their leaders impact the level of stress of the subordinates?

In the above forgoing, the objective of the current research paper is to measure the impact of leadership integrity on Depression, Anxiety and Stress among employees during COVID-19, and the contribution of this research to the existing literature is manifold. First, it contributes to the literature on the role of the leader's integrity on the mental health of employees (Depress, Anxiety and Stress); secondly, it examines such linkages in periods of uncertainty like the COVID-19 pandemic, which stakes business continuity and negatively affected the mental health of leaders and employees. The third contribution of this paper is to study the above dynamics in the case of Indian marine engineers, as there is a lack of scientific attempts in this sector, which makes this study explorative in nature.

2.1 METHODOLOGY

The study attempts to study the linkage between leadership integrity and the mental health of employees during the COVID-19 period among Indian marine engineering domain those who worked on board ships during the pandemic. Marine engineering is a special case study in terms of understanding the leader's integrity and its impact on employee health outcomes during COVID-19. This is because, unlike shore-based organisations, a Ship in itself is an organisation which is floating in a risky environment of the sea. Like any other organisation on board a ship, there are prototypical role-based set hierarchies with rules that are followed by seafarers while performing in role job performance to ensure the safety of self and cargo. A ship can be divided into two parts, i.e., the deck side (the upper part of the ship) and the engine side (the lower part of the ship). On the deck side, deck officers perform their duties, and marine engineers perform their role-based jobs on the engine side of the ship. The Chief Engineer and Second Engineer are the managerial roles who plan and organise tasks with the help of the third engineer, fourth engineer and crew members.

In the shipping industry, job roles are contractual in nature. In the past, a typical contract of an engineering officer continued for 12 months; however, in recent times, the time period of these job contracts has been reduced to anywhere between 4-6 months. Therefore, the set hierarchies are strictly maintained, and rules and orders are obeyed for the safe sailing of cargo from a source to a destination. Since roles and rules are defined, the relationships between a Chief Engineer or Captain of the ship and subordinating engineering officers are very mechanical, with few human connections at work place. Shorter contracts just facilitate such a lack of emotional connection between leadership on board ship and their subordinates. This is also considered as a way of work life as job roles are strictly defined, and every officer has a set of tasks to be done during the contract period. Also, due to the heavy workload and constrained work environment on board ships with a limited workforce available at the disposal of the Chief and Second engineer, work fatigue and the mental health of the engineers are always challenging. However, these dynamics further worsened during COVID-19, which came up with new protocols, namely extended work contracts (12 months on average), no certainty for on-time sign-offs, no immediate crew change, COVID quarantine rules, online surveys, no shore leaves, etc. This led to a situation where seafarers could not leave ships and thus had to have more human interactions on board ships. In these circumstances, the mental wellbeing of employees on board ships called for a high level of leader's (Chief Engineers and Second Engineers) integrity and communication. It is, therefore, important to study the dynamic linkages between leadership integrity and Depression, Anxiety and Stress among marine engineers during COVID-19. Also, the study considers Indian marine engineers as such studies on maritime are also important for India when the current foci of India's policy is the growth of the blue economy which is much illuminated in the vision of the current leadership of India. Further, India has traditionally been a maritime nation and supplies an escalated number of seafarers to the world maritime sector. Thus, a study of this nature would prescribe necessary intervention for a country like India to handle the health outcome of seafarers, particularly in uncertainties, and help nurture India's maritime forte further.

Due to the scattered nature of the population and the absence of a sample frame, a snowball sampling technique is used for data collection. An online survey was carried on during December 2023 and January 2024. A structural Equation Modeling technique is used to measure the linkage between various variables. In this regard, Kline (2005) offered sample size guidelines for analysing structural equation models, suggesting that a sample of 100 is considered small, a sample of 100 to 200 is medium, and a sample over 200 is considered large. A minimum 5:1 ratio is recommended between the sample size and the number of free parameters to be estimated (Bentler and Chou, 1987). Data was collected from 105 serving Indian marine engineers who sailed for a significant period during different waves of the COVID-19 pandemic. The respondents belong to all ranks between chief engineers and fourth engineers.

2.1.1. Tools used for data collection

Data for the study was collected through a battery consisting of the following instruments. While asking the respondents to respond to the survey questionnaire, it was specifically indicated to respond based on what they experienced while sailing during different COVID-19 pandemic waves.

i. Socio-demographic variables: This instrument was designed to collect data on age, sex, marital status, job experience, job rank, etc.

ii. Perceived Leadership Integrity Scale (PLIS): The perceived Leadership Integrity Scale (PLIS) was developed by Craig and Gustafson in 1998 and is a widely used instrument among researchers (Enwereuzor et al., 2020). The instrument was developed to facilitate the leaders by providing feedback on their behaviour. This instrument focuses on the interpersonal relationship aspects between the leaders and the followers as well as ethical issues associated with leadership. This instrument consists of 31 items, which are measured through a four-point Likert scale ranging from 1 (not at all) to 4 (exactly). The items of this scale are negatively worded; as a reason, the scores obtained through the survey were reversed so that the higher score will reflect higher leadership integrity and vice-versa.

iii. Depression, Anxiety and Stress Scale (DASS): The 'Depression Anxiety Stress Scale' (DASS) is a 42-item scale developed by Lovibond, S.H., Lovibond, P.F. in 1995. This is a 4-point Likert scale varying from 0 (never) to 3 (almost always) and is widely used in measuring levels of depression, anxiety and stress among individuals (Sing et al., 2015). Each of the variables, i.e., 'depression', 'anxiety' and 'stress', is measured through 14 items.

The quality of data depends to a large extent on the quality of the data collection instrument. Hence, the reliability and validity of such an instrument need to be tested prior to deploying the same. For the present study, the factor loadings of the items are shown in Table 1.1. Items that failed to achieve a factor loading of at least 0.5 were dropped (Hair *et al.*, 2009) except item No 'A6', which is almost 0.50.

Table 1.1: Table showing factor loadings of the items

Variable	Item	Factor Load	Variable	Item	Factor Load	Variable	Item	Factor Load
Perceived Leadership Integrity	PL1	0.69	Perceived Leadership Integrity	PL26	0.80	Anxiety	A6	0.49
	PL2	0.45*		PL27	0.79		A7	0.46*
	PL3	0.74		PL28	0.76		A8	0.40*
	PL4	0.75		PL29	0.61		A9	0.65
	PL5	0.72		PL30	0.81		A10	0.87
	PL6	0.79		PL31	0.87		A11	0.85
	PL7	0.76	Depression	D1	0.60		A12	0.51
	PL8	0.81		D2	0.61		A13	0.81
	PL9	0.69		D3	0.50		A14	0.41*
	PL10	0.79		D4	0.75	Stress	S1	0.38*
	PL11	0.60		D5	0.81		S2	0.62
	PL12	0.82		D6	0.33*		S3	0.84
	PL13	0.86		D7	0.59		S4	0.78

	PL14	0.88		D8	0.65		S5	0.69
	PL15	0.92		D9	0.74		S6	0.58
	PL16	0.85		D10	0.83		S7	0.55
	PL17	0.88		D11	0.63		S8	0.67
	PL18	0.80		D12	0.62		S9	0.65
	PL19	0.88		D13	0.38*		S10	0.73
	PL20	0.88		D14	0.78		S11	0.87
	PL21	0.87	Anxiety	A1	0.30*		S12	0.77
	PL22	0.72		A2	0.68		S13	0.84
	PL23	0.74		A3	0.53		S14	0.66
	PL24	0.76		A4	0.46*			
	PL25	0.88		A5	0.42*			

*Items deleted due to lack of factor loadings
Author's own estimation

2.1.2. Internal Consistency and Validity of the Instruments

Cronbach's Alpha, a measure of the internal consistency or reliability of an instrument, is most widely used by researchers (Trizano-Hermosilla and Jesús, 2016). In this context, Fraenkel and Wallen (1996) opined that Cronbach's alpha values between 0.70 and 0.99 are acceptable. Similarly, Cronbach's Alpha >= 0.8 is considered good and >= 0.9 is excellent (George and Mallery, 2018). The Cronbach's Alpha, convergent validity and discriminant validity of the instruments are shown in Table 2.1.

Table 2.1.: Estimated Cronbach's Alpha, Composite Reliability, Average Variance Explained and Heterotrait-Monotrait Ratio of Correlation values of the modified instruments

Variables	Cronbach's Alpha	AVE	CR	HTMT		
				Depression	Anxiety	Stress
Depression	0.91	0.47	0.91			
Anxiety	0.88	0.47	0.87	0.83		
Stress	0.93	0.52	0.93	0.88	0.85	
Perceived Leadership	0.98	0.64	0.97			

Author's own estimation

As pointed out by Fornell and Larcker (1981), the convergent validity is still adequate even if the Average Variance Explained (AVE) is less than 0.50, but the Composite Reliability (CR) is more than 0.60. The Heterotrait-Monotrait Ratio of Correlations (HTMT) is a measure used to determine the discriminant validity of an instrument, which Gold *et al.* (2001) proposed a value of up to 0.90. The Cronbach's Alpha, CR, AVE and HTMT are in Table 3.1. indicate adequate reliability, discriminant and convergent validity.

The instruments are modified based on the factor loads, the tests of reliability and validity. The number of items in each of the instruments is shown in Table 2.2.

Table 2.2. Table showing the number of items in each instrument

Instrument		No. of items	Type of instrument
Perceived Leadership Integrity Scale (PLIS)		30	4-point Likert Type Scale
Depression, Anxiety, Stress Scale (DASS)	Depression	12	
	Anxiety	08	
	Stress	13	

Author's own estimation

Multivariate normality: It is necessary to carry out a test of the multivariate normality of the data. The multivariate normality was estimated using the Web Power online tool (Web Power, 2018). The multivariate normality test results revealed that the p-values for Mardia's multivariate skewness and kurtosis were below 0.05, indicating the non-normality issue (Mamun & Fazal, 2018).

Data analysis using 'R': 'R' is a programming language widely used for statistical computing, data analysis, graphical presentation of data, etc. The present study employs Structural Equation Modeling (SEM) in answering the research questions RQ_1, RQ_2 and RQ_3, as stated earlier. SEM evaluates the relationships between variables and gains insights into the underlying structures and processes. According to Bentler & Chou (1987), SEM is a statistical method that takes a hypothesis-testing approach to analyse a structural theory bearing on some phenomenon. Due to its ability to express complex relations among a number of variables with model validity, SEM has become a preferred choice among researchers.

SEM is found to be one of the most popular tools in data analysis in social sciences (Kwok et al., 2018). SEM conveys two aspects viz., (i) that a series of regression equations represent the causal processes under study and (ii) these structural equations can be modelled pictorially to enable a clearer conceptualisation of the theory under study. The developed model is tested, and if the goodness of fit is found adequate, the model indicates reasonable relations among the variables (Byrne, 2016). As the data is ordinal in nature, the method of estimation followed was DiagonallyWeighted Least Squares (DWLS), which is a recommended method for SEM when the observed data is ordinal in nature (Savalei & Rhemtulla, 2013; Shi et al., 2018). Several pieces of existing evidence recommend the use of DWLS estimation with robust correction for ordinal data (DiStefano & Morgan, 2014; Muthén & Kaplan, 1992; Rhemtullaet al., 2012). The present study estimated the SEM using Weighted Least Squares Means and Variance Adjusted (WLSMV), which is a robust variant of DWLS.

3.1 RESULTS

Table 3.1. Demographic profile of the respondents

	Age (in years)						Job Rank			
	21-25	26-30	31-35	36-40	41-45	45+	CE	2E	3E	4E
Count	2	27	23	24	3	26	21	62	12	10
%	1.90	25.71	21.90	22.86	2.86	24.76	20.00	59.05	11.43	9.52
	Sailing Experience						Marital Status			
	1-5	6-10	11-15	16-20	21-25	25+	Married		Unmarried	
Count	24	42	28	6	1	4	73		32	
%	22.86	40.00	26.67	5.71	0.95	3.81	69.52	0.00	30.48	0.00

Source: Based on primary data collected by authors

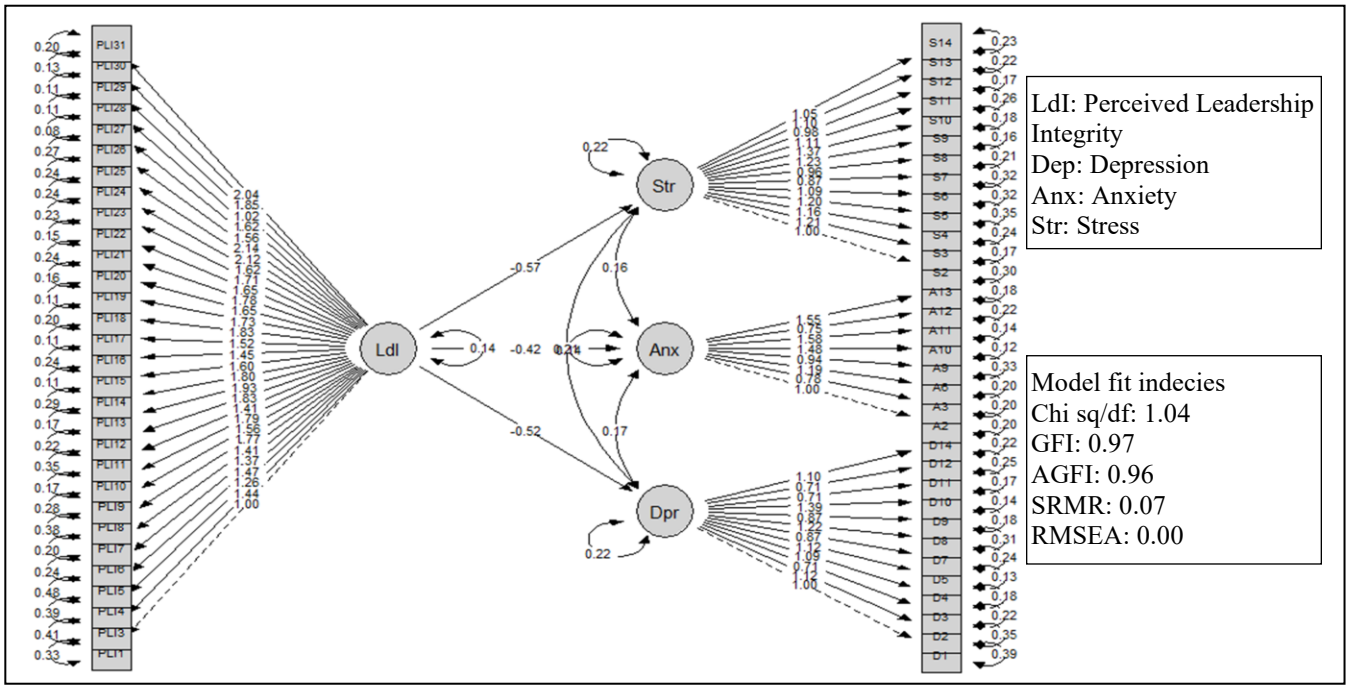
The demographic profile of the respondents shows that most of the respondents are working as Chief and Second Engineers. The second engineers are generally the mid-level managers who are working under the supervision of Chief Engineers. The respondent-based data comprises nearly 80 per cent of respondents who are working in subordinate roles on board ship. Also, 40 per cent and 37.14 percentage (total of all respondents having experience of more than 10 years) of the respondents have been working in the shipping industry with more than 6 years and more than 10 years of experience, respectively (Table 3.1.). This shows that these respondents are experienced working professionals in shipping. Therefore, they could identify the linkage between leadership integrity, Depression, Stress and anxiety in pre and during the COVID-19 period. Given the contractual nature of the job in shipping, such experience gives these respondents a chance to work under various leaders in shipping and is suitable to respond to questions related to leadership integrity and mental health among employees, particularly during COVID-19.

3.1.1. Impact of Perceived Leadership Integrity on Depression, Anxiety and Stress during uncertain periods among Indian marine engineers.

It is already revealed earlier through existing pieces of literature that uncertain periods lead to an increase in stress, anxiety and depression among individuals. It is also viewed that seafarers faced depression, anxiety, and stress and even experienced suicidal tendencies during the pandemic.

The present study aims at looking at the relationships between leadership integrity as perceived by subordinate marine engineers and depression, anxiety and stress experienced by such subordinates. The above relationship is tested using a Structural Equation Model and a path model, and the output is presented in Figure 1.1. and Table 3.2.

Figure 1.1. SEM Path Model on Impact of Leadership Integrity on Depression, Stress, and Anxiety among Indian Marine Engineers During COVID-19



Source: Authors own estimation based on primary data

Table 3.2.Table showing regression between perceived leadership integrity and depression, anxiety, stress

Independent variable	Dependent variable	Estimate	Std. Err	z-value	P-value	Std. lv	Std. all
Perceived Leadership Integrity	Depression	-0.523	0.244	-2.147	0.032*	-0.379	-0.379
	Anxiety	-0.424	0.207	-2.047	0.041*	-0.385	-0.385
	Stress	-0.575	0.274	-2.099	0.036*	-0.415	-0.415

*Significant at 0.05
Source: Authors' own estimation based on primary data

The outputs of Table 3.2 above are summarised with respect to the formulated research questions and also produced in Table 4 below.

Table 4. Final results illuminated in the context of research questions

Research Questions	Significance (p-value)	Answer to the Research Question	Explanation
RQ_1: During uncertain periods, does the perception of subordinates on the integrity of their leaders impact the level of depression of the subordinates?	0.032	YES	A negative regression coefficient, along with a p-value <0.05, indicates a significant converse impact of leadership integrity during the pandemic on the depression of subordinate Indian marine engineers.
RQ_2: During uncertain periods, does the perception of subordinates on the integrity of their leaders impact the level of anxiety of the subordinate?	0.041	Yes	A negative regression coefficient, along with a p-value <0.05, indicates a significant converse impact of leadership integrity during the pandemic on the anxiety of subordinate Indian marine engineers.
RQ_3: During uncertain periods, does the perception of subordinates on the integrity of their leaders impact the level of stress of the subordinates?	0.036	Yes	A negative regression coefficient, along with a p-value <0.05, indicates a significant converse impact of leadership integrity during the pandemic on the stress of subordinate Indian marine engineers.

Source: Authors own estimation based on primary data

4.1 RESULT ANALYSIS AND DISCUSSION

Though studies on ethical leadership and employee wellbeing have been experimented with, leadership integrity to date has a very limited exploration. However, leadership integrity has been seen as an important driver for ethical leadership (Van Aswegen and Engelbrecht, 2009; Palanski and Yammarino, 2011).

The present study attempts to explore an area which is hardly touched upon by earlier studies, i.e., the impact of leadership integrity of superior marine officers on the depression, anxiety and stress of subordinate Indian marine engineers. Such an area of study becomes further rare as this study explores the above impact when the situation is uncertain.

The present study indicates that during uncertain periods, a significant impact of leadership integrity on depression, anxiety and stress. Such an impact is not only significant but also converse in nature, i.e., a high level of integrity among superior marine officials leads to a lower level of depression, anxiety and stress among subordinate Indian marine engineers, and vice versa. This is also true during COVID-19. Such a finding shows similarity with some of the previous studies. The findings align with a study by Ashforth et al. (2016), which showed that violation of integrity by leaders could seriously threaten followers, and such threats may lead to a host of negative emotions and behaviours. Similar to this, ethical leadership has been found to be a predictor of followers' psychological wellbeing (Avey et al., 2012). On the other hand, ethical leadership has been seen to be a predictor of the moral emotions of the followers (Zhang et al., 2018). Leadership integrity is seen to have positively correlated with the psychological empowerment of employees (Shabir and Amina, 2024). Similarly, this study complements previous findings that authentic leadership, which is manifested by, among others, through integrity of leaders, influences the positive mood of the employees (Hsiung, 2012).

5.1 LIMITATIONS OF THE PRESENT STUDY

The present study is based on the primary data collected between December 2023 and January 2024 from Indian marine engineers who sailed during the COVID-19 pandemic waves, which took place more than a year back. Therefore, the perception of the respondents considering the COVID-19 pandemic wave periods may not be accurate due to time gaps. Further, the responses are based on the perception of the respondents, which may be subject to biases of the respondents. Apart from these, due to the selection of a non-random sampling technique, the density of respondents is not even across age, job ranks, sailing experience, and marital status.

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