

# The Impact of Stress and Self-Esteem on Depression Among Malaysian Armed Forces Personnel: Implications for Mental Health and Operational Readiness

Kwong Fook Wen\*, Inderjit S, Jessica Ong HL

National Defence University of Malaysia, Sungai Besi Camp, 57000 Kuala Lumpur, Malaysia  
\*Corresponding Author: fwkwong2000@yahoo.com

Copyright©2023 by authors, all rights reserved. Authors agree that this article remains permanently open access under the terms of the Creative Commons Attribution License 4.0 International License

Received: 10 October 2023; Revised: 30 October 2023; Accepted: 20 November 2023; Published: 20 December 2023

**Abstract:** This study explores the relationship between stress, self-esteem, and depression among personnel in the Malaysian Armed Forces (MAF). The aim is to address the implications of depression within the MAF, including its potential impact on operational readiness and the ability to safeguard national interests. A quantitative approach was used, employing a cross-sectional design with a sample size of 400 respondents. Questionnaire surveys were used to assess stress levels, self-esteem, and depression. The findings reveal a significant positive relationship between stress and self-esteem with depression in the MAF, with stress demonstrating a stronger influence. These results have important implications for the MAF, offering insights into the development of prevention and intervention strategies to combat depression among military personnel. By improving mental health through targeted programs and policies, personnel will be better equipped to fulfil their duties and responsibilities. Additionally, this study emphasises the importance of addressing depression in the military and serves as a valuable foundation for further research and action. Effectively addressing depression in the military is crucial for maintaining the readiness and effectiveness of the armed forces, ensuring the safety and security of the nation.

**Keywords:** *Depression, Stress, Self-esteem, Mental*

## 1. Introduction

Depression poses significant consequences within the military, impeding the operational readiness of the Malaysian Armed Forces (MAF) and diminishing its capacity to safeguard national interests and sovereignty. These repercussions manifest as reduced productivity, absenteeism, and compromised physical and mental well-being. Depression is characterised by impaired mental health, characterised by symptoms such as a despondent state of mind, diminished concentration and interest in tasks, and physical manifestations like loss of appetite or weight, sleep disturbances, feelings of worthlessness, unexplained fatigue, difficulties in decision-making and concentration, psychomotor issues, and suicidal thoughts [1].

In order to comprehend the relationships between stress, self-esteem, and depression among MAF personnel, this study establishes the concept and operational definition of depression. Furthermore, it investigates the prevalence of stress and self-esteem as precursors to depression among MAF personnel, highlighting the research methodology employed. The subsequent sections delve into the discussion of findings and data, leading to conclusive remarks and recommendations for future research. The outcomes of this study hold the potential to assist the MAF in formulating preventive and intervention strategies to address depression within the working environment. Additionally, they provide valuable insights for the development of mental health programs and policies within the organisation. By effectively addressing the issue of depression within the military, the armed forces can maintain their readiness and effectiveness,

**Corresponding Author:** Kwong Fook Wen, National Defence University of Malaysia, Sungai Besi Camp, 57000 Kuala Lumpur, Malaysia. Email: fwkwong2000@yahoo.com

thereby ensuring the safety and security of the nation.

## 2. Materials and Methods

### 2.1. Prevalence and Consequences of Depression

Depression is a significant global health concern, affecting a substantial number of individuals worldwide, with an estimated quarter of a million people affected [2]. In the Western Pacific region, the estimated prevalence of depression is approximately 5.73% of the population [3]. In Malaysia, a 2019 study revealed that depression affects 2.3% of the population [4]. Prevalence studies on depression within military contexts have yielded varying outcomes across different countries. For instance, a cross-sectional study conducted in the Thailand Army reported a depression prevalence of 10.75% [5], while in the United States, the occurrence of depression among actively serving military personnel was 9.4% in 2015 [6].

Depression, as a consequence of poor mental health, can lead to reduced work productivity, absenteeism, income loss, and other physical and mental health issues. In severe cases, it may even contribute to suicidal tendencies when left untreated or disregarded. Such outcomes can hinder optimal organisational performance and impede the effective execution of duties [7]. Moreover, the health burden imposed by depression places additional strain on healthcare resources and the economy [8]. Depression as a health issue can be comprehended from a biopsychosocial understanding of health as depicted in Figure 1.

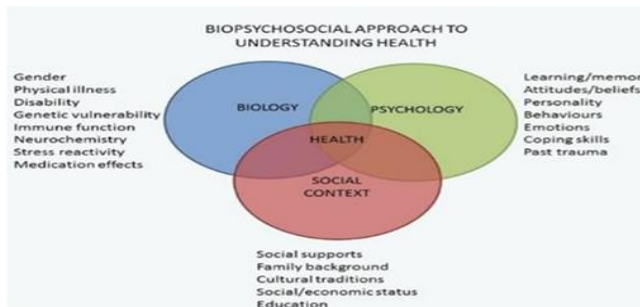


Figure 1 - Biopsychosocial Model of Health

Source: Megan (2021) [9]

Individuals with depression often exhibit imbalances in their endocrine, immune, and neurotransmitter systems, as illustrated in Figure 2. These biological imbalances contribute to the development of depression. Furthermore, individuals with depression are more susceptible to experiencing other physical health problems, and conversely, those with physical complaints are more prone to depression [2]. Additionally, depression can be genetically inherited across generations [10].

Psychological factors associated with depression include

negative thought patterns, limited coping skills, impaired judgment, and decreased emotional intelligence (the ability to recognise, understand, and express emotions) [11]. To some extent, these psychological aspects can be influenced by biological factors, such as disposition and personality, as well as social factors, including the coping mechanisms exhibited by family members and teachers during an individual's upbringing [12]. It is essential for organisations, including the military, to acknowledge the impact of depression on their personnel and implement preventive and intervention measures to effectively address this issue in the working environment. Research outcomes on depression within the military can inform the development of mental health programs and policies aimed at promoting improved mental well-being among personnel.

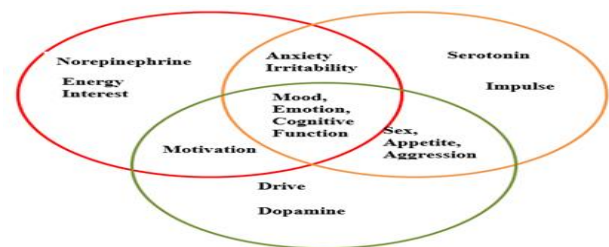


Figure 2 - Causes of depressive symptoms

Source: Neurobiology of Depression (Sadek & Nemeroff, 2020) [13]

The working environment of the MAF is distinct and differs from many other countries armed forces. While the MAF is currently not directly involved in armed conflicts like it was in the past during the Communist Insurgency threat in the 1960s and 1970s, it still faces unique psycho-social challenges due to multiple factors. The MAF now participates in operations such as defending the nation's land borders, coast, and airspace and assisting other agencies and civil authorities in humanitarian assistance and disaster relief operations. Additionally, the MAF contributes to international Peacekeeping Operations under the United Nations. Despite the absence of armed conflicts and war, MAF personnel are exposed to demanding environments that present psycho-social challenges. Like other military forces worldwide, the MAF faces arduous responsibilities, obligations, and sacrifices [14]. These unique working conditions necessitate the maintenance of sound mental health among personnel to ensure the efficient performance of their duties.

Data from MAF hospital outpatient clinic reports indicated mental health disorders affected 1.4% of MAF personnel in 2013, with a gradual increase in cases over the years. In 2020, mental health cases rose to 2.3% [15]. Depression, as a leading cause of morbidity, can have devastating consequences if its occurrence surges within the military, impacting operational readiness and hindering the MAF's ability to fulfil its duties. The findings of this

research can assist the MAF in devising strategic prevention and intervention measures specifically targeted at addressing depression within the working environment. The outcomes can serve as a foundation for formulating mental health programs and policies within the MAF.

## 2.2. Conceptualising Depression: Factors, Measurements, and Domains

Depression is a complex condition influenced by various factors, including biological, psychological, social, and lifestyle factors [11]. Baqutayan's (2015) study emphasises that low self-esteem, negative stress coping mechanisms, and cognitive immaturity contribute to poor mental health and increase the risk of depression [16].

Numerous studies have been conducted to determine the prevalence of depression in different populations. Kader Maideen et al. (2014) conducted a study in the state of Selangor, involving 1460 adults, and found that 10.3% of participants were diagnosed with depression using the Patient Health Questionnaire - 9 (PHQ-9) [17]. Another study by Aris et al. (2014) conducted in a primary care setting in Kuantan, involving 452 patients, found that 10.6% of participants had depression [18]. According to the U.S. Department of Defence's Health-Related Behaviours Survey (HRBS) in 2015, 9.4% (CI: 8.4-10.5) of active-duty U.S. service members had probable depression, as indicated by PHQ-9 scores of 15 or above. This figure is higher than the estimated 6% of U.S. adults reported in the previous year [6]. In Malaysia, data from the Malaysian Armed Forces (MAF) hospital outpatient clinic report showed that mental health disorders accounted for 0.14% of total reported diseases among MAF personnel in 2015 [19], which increased to 0.23% in 2020 [15].

The conceptualisation of depression in this study focuses on two major contributors: stress and self-esteem. The research aims to investigate the linear relationship between depression and these two independent variables. The conceptual framework for this research is illustrated in Figure 3.

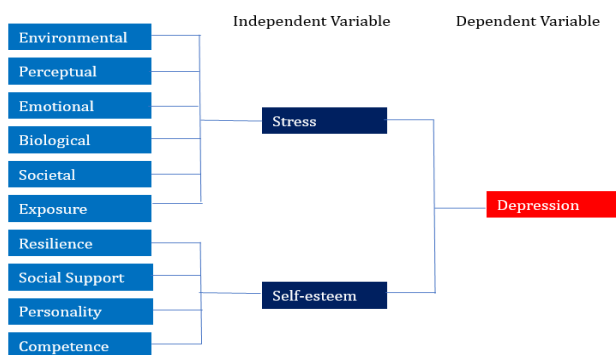


Figure 3 – The Conceptual Model of Depression

### 2.2.1. Depression

Depression is a complex mental health condition that extends beyond temporary mood changes or short-term emotional responses to daily challenges. When left untreated, it can develop into a severe and debilitating illness, causing significant suffering and impairing work performance and personal relationships. In severe cases, it can even lead to suicide. The World Health Organisation (WHO) reports that approximately 800,000 people die from suicide each year [2]. Dr. George Engel's biopsychosocial model explains the intricate mechanisms underlying depression, emphasising the interconnectedness and interdependence of biological, psychological, and social factors, with the body and mind being interconnected entities. Biological factors such as age, ethnicity, sex, family history of psychiatric illnesses, and the presence of chronic diseases have been associated with depression [4] [17]. Psychological factors, including stress, low self-esteem, and negative coping mechanisms, can impact an individual's ability to manage stress and contribute to depression [16]. The psychological and social aspects of mental health are also influenced by biology (such as disposition and character) and social factors, such as the coping mechanisms modelled by family members and teachers during childhood [12]. Thus, in this research, depression is operationalised through the domains of stress and self-esteem.

### 2.2.2. Stress

Stress is the term used to describe experiences where the demands of a situation exceed an individual's perceived ability to cope effectively. Stress can be measured in various ways, including physiological stress responses. When the body experiences stress, it activates the sympathetic nervous system and the hypothalamic-pituitary-adrenal (HPA) axis, leading to the release of hormones like adrenaline and cortisol. These physiological reactions serve as indicators of stress and can be measured by monitoring heart rate variability, breathing frequency, and blood pressure. In studies of stress and its effects on physical and mental health, stress has been operationalized in different ways to ensure the validity of stress measures. Research has shown that multidimensional models of stress are more effective in measuring the health effects of stress as they consider environmental, perceptual, and emotional components [20].

Stress has been extensively linked to physical and mental health issues in numerous studies. One such model is the job strain model, which describes the relationship between high work demands, low control over the work environment, and negative health effects. Decades of research have linked high job strain to increased risks of anxiety, depression, cardiovascular events, and metabolic syndrome. A study of the Whitehall II cohort found that chronic work stress was associated with an increased risk of coronary heart disease, particularly among participants under 50. Other components

of work stress, such as effort-reward imbalance, have also been linked to an increased risk of cardiovascular disease.

In addition to work stress, social factors such as lack of social support and traumatic experiences can also contribute to depression. These social determinants can act as triggers that alter brain functioning, and inadequate social support can influence an individual's psychology, activating the stress pathway in the brain and leading to neurotransmitter imbalances. It is important to note that psychological and social factors are interdependent and can mutually influence each other. For example, poor social support can impact an individual's mental well-being, which, in turn, can influence the perception of stress and trigger the stress response in the body.

### 2.2.3. Self Esteem

Self-esteem is a crucial factor in overall well-being and can affect an individual's feelings towards themselves and others. According to Mruk (2006), self-esteem is defined as an attitude and perception of oneself that influences interactions and emotions [21]. Yoobin et al.'s (2019) study found a correlation between low self-esteem levels and the development of depression [22]. Therefore, early intervention for depression should focus on enhancing resilience, social support, and positive aspects of personality.

Several measures can be used to assess the relationship between self-esteem and depression, including resilience, social support, personality, and competence. The Rosenberg Self-Esteem Scale (RSES) is one such tool, consisting of ten self-reported items that measure both positive and negative feelings towards oneself, with higher scores indicating higher self-esteem. Resilience is measured using the Resilience Assessment Scale (RAS), which includes a 12-item questionnaire to assess a person's ability to cope with emotions, handle problems, and seek social support. Social support is assessed through the Social Support Scale, a 25-item self-reported questionnaire that measures perceptions of social support and satisfaction with interpersonal relationships. Personality, which affects self-esteem, can be evaluated using the NEO-Personality Inventory (NEO-PI), a 60-item questionnaire that provides a description of personality traits, including interpersonal, motivational, and emotional styles.

In summary, self-esteem plays a critical role in the development of depression, and it is important to assess its relationship with other factors such as resilience, social support, personality, and competence. Self-reported questionnaires like the RSES, RAS, Social Support Scale, and NEO-PI can help assess an individual's self-esteem and provide valuable insights into improving overall well-being.

### 2.2.4. Operationalising the Domains of Depression

The domains of stress and self-esteem were defined and measured using the ten operationalised dimensions presented in Table 1. Survey items were created for each of the ten dimensions and incorporated into the questionnaire to assess depression.

**Table 1 - Descriptions of the domains of Depression**

Domain	Dimension	Description
Stress	Environmental	The interaction of environmental contexts influences the psychological and physiological stress response. The situation of events or trauma affects cognitive, socio-emotional, and behavioural outcomes, leading to stress [23].
	Perceptual	The degree to which situations in one's life are appraised as stressful. The Perceived Stress Scale (PSS) is a widely used psychological instrument for measuring the perception of stress. Its items are designed to tap into how unpredictable, uncontrollable, and overloaded respondents find their lives.
	Emotional	The interference of emotions with one's ability to function leads to unhealthy stress.
	Biological	Stress-induced changes due to biological pathways linking stress to cardiovascular disease indicate stress-related alterations in the immune, autonomic, and neuroendocrine systems. Family history of mental and chronic illness contributes to biological factors.
	Societal	Includes social support, harassment, early separation, or similar traumatic situational experiences that lead to depression.
	Exposure	The developmental or life stage during which stressors occur. Stressor exposures can be measured with self-report questionnaires such as a life events checklist, assessed by an interviewer, or objectively determined based on proximity to an event.
Self-esteem	Resilience	Resilience is assessed and measured by the ability to cope with emotions, solve problems, and gain social support. The Resilience Assessment Scale (RAS) includes three types of positive self-appraisals: emotion-coping appraisals, situation-coping appraisals, and social support appraisals. The questions focus on participants' emotional control and their relationships with friends and family.
	Social Support	The interaction of individuals with their surroundings and communities involves emotional, informational, and material support, as well as evaluation of such support. The Social Support Scale is a tool for measuring perceptions of social support and satisfaction with interpersonal relationships.
	Personality	Includes interpersonal, motivational, and emotional styles of both adults and adolescents. Personality is assessed using the NEO-Personality Inventory (NEO-PI), which provides a description of personality traits.
	Competence	Relates to an individual's motivation in facing challenges that can be met. Success results in feelings of efficacy and pride, promoting self-esteem.



### 2.3. Methods

This research aimed to model and analyse the relationships among the constructs outlined in the conceptual framework. A quantitative research design was employed using non-experimental correlation, specifically multiple regression and Partial Least Square Structural Equation Modelling (PLS-SEM) techniques. The variables of stress, self-esteem, and depression were examined to determine their degree of association and relationships. The research adopted a model that incorporated causal paths and assessed the collective contribution of stress and self-esteem in measuring depression within the Malaysian Armed Forces (MAF). Cross-sectional studies were conducted using a questionnaire for data collection, and the statistical methodology employed was the Smart-PLS 3.0 program, which utilises a hypothesis-testing approach to analyse the structural theory pertaining to the measurement of depression. The study was carried out at the Military Medicine Department (MMD) of Hospital Angkatan Tentera Tuanku Mizan (HATTM) in Kuala Lumpur, Malaysia, the central facility for compulsory medical check-ups for MAF personnel from all three services. The target population for the survey consisted of MAF personnel, with a sample size of n=400. The questionnaire consisted of five sections. Section A collected socio-demographic information and biological factors. Section B focused on behavioural characteristics such as smoking, alcohol consumption, illicit drug usage, sleep quality, and physical activity. Section C measured stress levels using the validated ten-item Perceived Stress Scale (PSS-10) [24]. Section D assessed self-esteem using the validated ten-item Rosenberg Self-esteem Scale (RSES-10) [25]. Finally, Section E measured depression.

### 2.4. Results and Discussion

The relationship between stress, self-esteem, and depression was examined using the Partial Least Square Structural Equation Modeling (PLS-SEM) algorithm. The results of the PLS-SEM algorithm, presented in Figure 4, showed standardised path coefficients ( $\beta$ ) indicating the strength and direction of the relationships between the constructs.

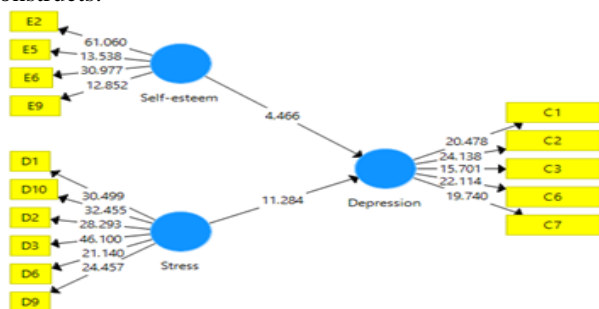


Figure 4 - PLS-SEM algorithm for a structural model of Depression

Stress exhibited a positive relationship with depression ( $\beta = 0.484$ ), while self-esteem showed a weaker positive relationship ( $\beta = 0.244$ ). These values were statistically significant, as determined by a bootstrapping test (Figure 5), indicating the reliability of the relationships.

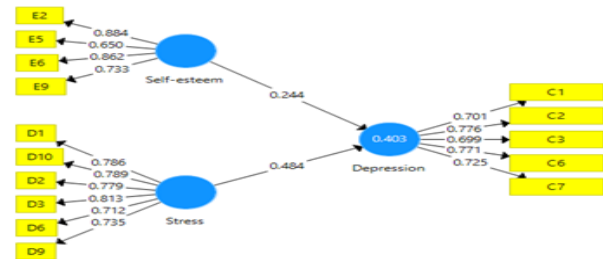


Figure 5 - Bootstrapping results of the structural model of depression

Hair et al. (2014) noted that bootstrapping provides the standard errors and empirical t values to determine the significance of coefficients [26]. The coefficient is considered significant at a given probability of error (significance level) if the empirical t value is greater than the critical level (1.96 for a 5% significance level). Table 2 shows that, based on this criterion, the relationships between stress and depression and self-esteem and depression are significant at a 5% error probability, as all t values are above the 1.96 thresholds. Among the three predictive constructs, stress ( $\beta = 0.484$ ) has a greater effect on predicting depression compared to self-esteem ( $\beta = 0.244$ ). Further analysis revealed that stress had a greater effect on predicting depression ( $\beta = 0.484$ ) compared to self-esteem ( $\beta = 0.244$ ).

Table 2 – Significance testing results of the structural model path coefficients

Path	t	95%	Significance
Coeffi	Values	P	Confidence
-cient	(>1.96)	Values	Intervals
Stress ->			Yes
Depression	0.484	11.284	0 [0.385, 0.556]
Self-esteem ->			
Depression	0.244	4.466	0.484 [0.19, 0.3085, 0.556]
Self-esteem -> Depression	0.244	4.466	0 [0.14, 0.346]

Further analysis revealed that stress had a greater effect on predicting depression ( $\beta = 0.484$ ) compared to self-esteem ( $\beta = 0.244$ ). The total effects reported in Table 3 confirmed this finding, showing that stress (0.474) had a stronger impact on depression than self-esteem (0.244). The coefficient of determination ( $R^2$ ) was used to assess the predictive accuracy of depression, with an  $R^2$  value of 0.403 indicating that 40.3% of depression was predicted by the stress and self-esteem variables. It represents the combined effect of

the exogenous latent variables (stress and self-esteem) on the endogenous latent variable (depression). However, Hair et al. (2014) stated that there are no set rules for acceptable R<sup>2</sup> values, as they depend on the complexity of the model and the research discipline [26]. R<sup>2</sup> values range from 0 to 1, with higher levels indicating a greater degree of predictive accuracy.

Table 3 - Results of total effects on depression

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
	(O)	(M)	(STDEV)	((O/STDEV))	
Stress -> Depression	0.484	0.489	0.044	11.284	0
Self-esteem -> Depression	0.244	0.245	0.055	4.466	0

Examining the effect sizes, stress demonstrated a medium effect on measuring depression ( $f^2 = 0.299$ ), while self-esteem had a small effect ( $f^2 = 0.077$ ). The contribution of stress to the R<sup>2</sup> value of depression was larger ( $f^2 = 0.299$ ) compared to self-esteem ( $f^2 = 0.077$ ), as shown in Table 4. These findings highlight the greater importance of stress in measuring depression. Based on Cohen's (1988),  $f^2$  values of 0.02, 0.15, and 0.35 represent small, medium, and large effects respectively [27]. Thus, stress had a medium effect on measuring depression, while self-esteem had a small effect.

Table 4 -  $f^2$  effect size

Variable/ Construct	Depression		
	Path Coefficient	$f^2$ effect size	Remark
Stress	0.473	0.299	Medium effect
Self-esteem	0.597	0.077	Small effect

Stone-Geisser's Q<sup>2</sup> was utilized to assess the predictive relevance of the depression model [28] [29]. The Q<sup>2</sup> values showed that the model had overall predictive relevance ( $q^2 = 0.455$ ), with stress ( $q^2 = 0.120$ ) demonstrating greater predictive relevance than self-esteem ( $q^2 = 0.030$ ). These values represented small to medium predictive relevance, indicating the role of stress in predicting depression. Hair et al. (2014) noted that  $q^2$  effect size values of 0.02, 0.15, and 0.35 represent small, medium, and large predictive relevance, respectively [26]. Thus, stress ( $q^2 = 0.120$ ) had small to medium predictive relevance and self-esteem ( $q^2 = 0.030$ ) had small predictive relevance in measuring depression. Stress stood out among the two dimensions for its predictive relevance in depression, as shown in Table 5.

Table 5 -  $q^2$  predictive relevance effect

Variable/ Construct	Depression	
	$q^2$ effect size	Remark
Stress	0.120	Small to Medium predictive relevance
Self-esteem	0.030	Small predictive relevance

An Importance-Performance Matrix Analysis (IPMA) was conducted to determine the relative significance and performance of the constructs in explaining depression. The IPMA, summarised in Table 6 and illustrated in Figure 2, indicated that stress played a key role in depression, while self-esteem was slightly less important. Both constructs showed similar performance levels, but stress had a greater effect in managing depression, as shown by its coordinates on the X-axis.

Table 6 - Relative importance and performance of different constructs on the depression model

	Importance (Total Effects)	Performance (Index Values)
Stress	0.484	23.067
Self-esteem	0.244	13.955

The data enables the creation of an IPMA illustration of depression, depicted in Figure 6. The IPMA indicates that stress plays a key role in depression. Self-esteem is slightly less important. As seen in the graph, both stress and self-esteem have nearly equal performance (Performance - Y-axis) at around 20 per cent on the scale. However, the IPMA provides further insight that, while stress and self-esteem contribute similarly to depression in the MAF, their impact differs, as shown by their coordinates on the X-axis (Importance - Effect). Stress has a greater effect (right side of X-axis values) than self-esteem (slightly to the left of the X-axis midpoint). Therefore, addressing both stress and self-esteem is crucial in managing depression within the MAF, with a focus on improving self-esteem to enhance overall efforts. Overall, these findings provide valuable insights into the relationships between stress, self-esteem, and depression within the context of the MAF, emphasising the significance of stress and the need to address both dimensions for effective depression management.

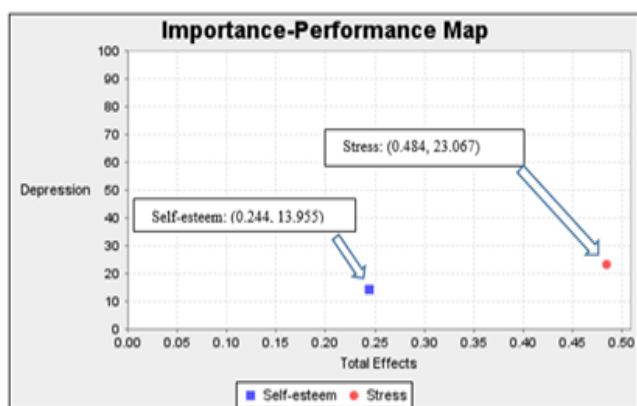


Figure 6 – Graphical IPMA representation of depression model

### 3. Conclusion

In conclusion, this study provides valuable insights into the relationship between stress, self-esteem, and depression among MAF personnel. The findings highlight the significant association between stress, self-esteem, and depression, emphasising the importance of addressing mental health issues within the MAF. While the number of reported cases of depression in the MAF may be low, it is crucial for the organisation to prioritise the mental well-being of its personnel. The MAF's Psychology Cell already undertakes activities to raise mental health awareness, but a more comprehensive analysis of the challenges in addressing mental health issues is necessary. Enhancing mental health screening and treatment can be achieved through the establishment of a screening tool, increasing the number of qualified counsellors, and maintaining centralised data on depression. These steps would contribute to more effective support for MAF personnel. Future research endeavours can focus on exploring the causes of stress among MAF personnel and developing preventive and intervention strategies. The findings of this study can serve as a valuable guide and reference for future research in this field, and it would be beneficial to replicate the study using different sampling techniques to validate and expand upon the current findings. By continuing to investigate and address mental health concerns, the MAF can foster a supportive and resilient environment for its personnel.

### REFERENCES

[1] APA, The Dictionary of American Psychiatric Association. Ed., Washington, 2020.  
 [2] WHO, Depression, 2020. Accessed (online) <https://www.who.int/news-room/fact-sheets/detail/>

depression  
 [3] WHO, Depression and Other Common Mental Disorders. Global Health Estimates, 2017. Accessed (online) <https://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf>  
 [4] IPH, National Health and Morbidity Survey (NHMS), 2019. Accessed (online) from National Institutes of Health, Ministry of Health Malaysia, 2020.  
 [5] I. Rukskul, T. Leelahanj, N. Hirunviwatgul, & A. Pholboonyaruk, "The prevalence of common mental disorders among outpatient Thai army personnel". Journal of Medical Association Thailand, 92 Suppl 1, S60-66, 2009.  
 [6] S. O. Meadows, C. C. Engel, R. L. Collins, R. L. Beckman, M. Cefalu, J. Hawes-Dawson, K. M. Williams., 2015 Department of Defense Health Related Behaviors Survey (HRBS): RAND Corporation, 2018. Accessed (online) <https://medium.com/inmehealth/how-to-measure-stress-d770da69152e>.  
 [7] L. C. X. Martins, & C. S. Lopes, "Military hierarchy, job stress and mental health in peacetime. Occupational Medicine", 62(3), 182-187, 2012. (DOI:10.1093/occmed/ kqs006).  
 [8] WHO, "Stress. Clinical experimental stress studies: methods and assessment Anjana Bali and Amteshwar Singh Jaggi", Journal Reviews in the Neurosciences, 2015. Accessed (online) <https://doi.org/10.1515/revneuro-2015-0004>.  
 [9] Megan. Three Aspects of Health and Healing: The Biopsychosocial Model in Medicine, 2021. Accessed (online) <https://surgery.wustl.edu/three-aspects-of-health-and-healing-the-biopsychosocial-model/>  
 [10] M. M. Weissman, O. O. Berry, V. Warner, M. J. Gameroff, J. Skipper, A. Talati, P. Wickramaratne, "A 30-Year Study of 3 Generations at High Risk and Low Risk for Depression", JAMA Psychiatry, 73(9), 970-977, 2016. (DOI:10.1001/jamapsychiatry.2016.1586).  
 [11] APA, What is Depression? American Psychiatric Association, 2020.  
 [12] G. L. Engel, "The clinical application of the biopsychosocial model", Am J Psychiatry, 137(5), 535-544, 1980. (DOI:10.1176/ajp.137.5.535)  
 [13] N. Sadek, & C. B. Nemeroff, Update on the Neurobiology of Depression, 2020. Accessed (online) [https://www.medscape.org/viewarticle/412866\\_7](https://www.medscape.org/viewarticle/412866_7).  
 [14] I. Singh, J. H. Liaw, & N. M. Mohaiyadin, "Impacts of Leadership Styles and Organizational Commitment towards Job Performance in the Malaysian Army", Advances in Natural and Applied Sciences, 2018. (DOI:10.22587/anas.2018.12.7.2).  
 [15] B. P. K. BPK, Laporan Tahunan PKAT 2020: Kor Kesehatan Diraja, 2020.  
 [16] S.M.S. Baqutayan, "Stress and Coping Mechanisms: A Historical Overview", Mediterranean Journal Of Social Sciences, 2015. Accessed (online) <https://www.mcser.org/journal/index.php/mjss/article/>

view/5927.

- [17] S. F. Kader Maideen, S. M. Sidik, L. Rampal, & F. Mukhtar, "Prevalence, associated factors and predictors of depression among adults in the community of Selangor, Malaysia", *PLoS One*, 9(4), e95395, 2014. (DOI:10.1371/journal.pone.0095395).
- [18] M. A. M. Aris, N. A. Halim, & R. Musa, "Prevalence of Depression and Its Associated Risk Factors in the Primary Care Setting in Kuantan", *British Journal of Medicine & Medical Research*, 2014.
- [19] B. P. K. BPK, *Bahagian Perkhidmatan Kesihatan. Laporan Tahunan PKAT 2015: Kor Kesihatan Diraja. Laporan Tahunan PKAT 2015: Kor Kesihatan Diraja*, 2015.
- [20] M. Lobel, & C. Dunkel-schetter, "Conceptualizing stress to study effects on health: Environmental, perceptual, and emotional components", *Anxiety Research*, 3:3, 213-230, 1990. (DOI: 10.1080/08917779008248754).
- [21] C.J. Mruk. *Self-Esteem Research, Theory, and Practice: Toward a Positive Psychology of Self-Esteem*. 3rd ed. Springer Publishing Company, New York, 2006.
- [22] B.A. Yoobin, Soo-Hee. Choi, Je-Yeon. Yun, Jae-A Lim, Yoonhee. Kwon, Lee, Young-Jang Hwa, H. Joon, "The relationship between levels of self-esteem and the development of depression in young adults with mild depressive symptoms", *Medicine*: October 2019 - Volume 98 - Issue 42 - p e17518. (DOI: 10.1097/MD.00000000000017518).
- [23] E. Epel, A. Crosswell, S. Mayer, et al., "More than a feeling: A unified view of stress measurement for population science". *Frontiers in Neuroendocrinology* 49: 146–169, 2018.
- [24] S. Cohen, T. Kamarck, & R. Mermelstein, "A global measure of perceived stress", *Journal of Health and Social Behaviour*, 24(4), 385-396, 1983.
- [25] J.A. García, F.C.Y. Olmos, M. L. Matheu, & T.P. Carreño, "Self-esteem levels vs global scores on the Rosenberg self-esteem scale", *Heliyon*, 5(3), e01378-e01378, 2019. (DOI:10.1016/j.heliyon.2019.e01378).
- [26] J.F. Hair, T. M. Hult, Ringle & Sarstedt, *A primer on partial least squares structural equation modelling (PLS-SEM)*, Sage Publishing, Inc., Los Angeles, 2014.
- [27] J. Cohen, *Statistical power analysis for the behavioural sciences*. Second Edition. Hillsdale, Lawrence Erlbaum Associates, Publishers, New Jersey, 1988.
- [28] M. Stone, "Cross-validators choice and assessment of statistical predictions", *Journal of the Royal Statistical Society*, 36(2), 111-147, 1974.
- [29] S. Geisser, "A predictive approach to the random effects model", *Biometrika*, 61(1): 101-107, 1974.