

Assessment and Correlation of WHO 5 Well-Being Index and Blood Pressure in Medical Professionals

Dr Vinitha V, Dr Ramidha V P, Dr Smrti Salim

Abstract: *This study investigates the interrelation between stress levels, well-being, and blood pressure among medical professionals, utilizing the WHO-5 Well-Being Index as a primary evaluative tool. Conducted on a cohort of medical professionals in Malabar Medical College and Research Centre, the research underscores the negative correlation between well-being scores and BP, highlighting the elevated stress levels within this demographic compared to the general population. The study findings reveal the significant impact of workplace stressors on medical professional's psychological and physical health, emphasizing the need for targeted interventions to mitigate the detrimental effects of stress on this vulnerable group. The research not only sheds light on the pressing issue of occupational stress in healthcare but also prompts a broader conversation on the importance of mental health support in high-stress environments.*

Keywords: Stress, WHO-5 Well-Being Index, Blood Pressure, Medical Professionals, Occupational Health

1. Introduction

Stress is a feeling of emotional strain and pressure [1] It is a response to a situation that results in physical or psychological alterations in a person. A certain amount of stress (eustress) is tolerable and can have positive effects by energizing people towards a particular goal. However excessive stress can have a negative impact on a person's health and job performance. [2]-

Health care is a stressful profession and negatively affects one at physical, emotional, behavioural and mental levels. Medical professionals face a lot of stressors like work overload, sleep deprivation, inordinate working hours, frequent exposure to emotionally agitated situations, dealing with difficult patients, conflicts with other employees, hostile job environment, professional responsibilities along with the stress surrounding a growing family, etc.

All these factors and many more have resulted in the burn out process in these professionals. The 'burnt out phenomenon', a terminology by Felton includes a triad of emotional exhaustion, depersonalization (treating patients like objects) and low productivity/achievements. It is especially common in health professionals under stress.(3)

In order to have a better understanding of the amount of stress faced, a reliable measure of emotional functioning and a good screening tool for depression named the WHO-5 Well-Being Index can be administered. The World Health Organization-Five (WHO-5) Well-Being Index [4] is a short, self-administered questionnaire *and this covers* five positively worded units revolving around the emotional status of the person over the past few weeks. The questionnaire is associated with positive mood (good spirits, relaxation), vitality (being active and waking up fresh and rested), and general interests (being interested in things). This questionnaire has been proved to be an authentic measure of emotional functioning and a simple screening tool for depression. The clinical validity of WHO-5 was

evaluated to be high, as it could be used regardless of any underlying illness and across various settings [5]

Stress can induce innumerable changes in the body like headache, muscular ache, sleeping difficulties, eating disorders, memory impairment, fatigue, restlessness, agitation, or depression, etc.. Chronic stress activate processes at the molecular, cellular, or systemic level in animals.[6]. In this study, we are determining the effect of stress on Blood pressure. Any form of stress can increase the blood pressure (BP) which occurs due to increase in sympathetic activity[7] and this has been found to have a definite association with cardiovascular diseases (CVD).[8,9]. Work related stressors cause recurrent autonomic system reactions leading onto the deleterious effects on BP.[10,11]

Very few studies are available which show association between well-being and BP. Hence, the aim of the present study was to determine the level of stress using simple tool like the WHO 5 well-being index and its effects on BP among medical professionals. This assessment would provide us with a rough estimate of the prevalence of stress among the medical professionals and could guide us in the necessity for interventions, if needed, for improving the mental health of medical professionals

2. Materials and Methods

It was a cross-sectional study conducted on 149 medical professionals [doctors and nurses] within the age group of 25–45 years working for atleast 8 hrs a day in Malabar Medical College and research Centre, Ulliyeri, Kozhikode. After the Institutional Ethical and Scientific Committee approval, the study group was selected randomly as per the inclusion and exclusion criteria. Volunteers with a history of major illness in the recent past, known case of hypertension, and family history of hypertension were excluded from the study. For the assessment of stress [psychological well-being], the WHO-5 well-being index [Figure 1] was used.

	<i>Over the last two weeks</i>	All of the time	Most of the time	More than half of the time	Less than half of the time	Some of the time	At no time
1	I have felt cheerful and in good spirits	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
2	I have felt calm and relaxed	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
3	I have felt active and vigorous	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
4	I woke up feeling fresh and rested	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0
5	My daily life has been filled with things that interest me	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1	<input type="checkbox"/> 0

Figure 1: WHO 5-well being index

Administering the WHO-5 well-being index takes just 2–3 mint. Each of the five items is rated on a 6-point Likert scale from 0 (=not present) to 5 (=constantly present). The raw score was calculated by totaling the figures of the five answers. The raw score ranges from 0 to 25, 0 representing the worst possible and 25 representing the best possible quality of life. A score below 13 indicates poor well-being. If the raw score is below 13 or if the patient has answered 0–1 to any of the five items, further assessment to confirm depression was implemented. The raw score was multiplied by four to procure a percentage score ranging from 0 to 100. A score of $\leq 50\%$ indicates poor well being/ low mood; $<28\%$ indicates depression.

Systolic BP (SBP) and diastolic BP (DBP) was measured in the right arm in supine position using a digital blood pressure monitor after 10 min of physical and mental rest [12]. The data collected so were analyzed using percentage and correlation coefficient test. $P < 0.05$ was considered as statistically significant.

Table 1: Correlation between WHO score and SBP
Descriptive Statistics

	Mean	Std. Deviation	N
who Score	14.34	5.514	149
SBP	115.03	10.773	148

Correlations

		Who Score	SBP
who Score	Pearson Coefficient	1	.167
	Sig. (2- tailed)		.042
	N	149	148
SBP	Pearson Coefficient	.167	1
	Sig. (2- tailed)	.042	
	N	148	148

*Correlation is significant at the 0.05 level (2- tailed)

Table 2: Correlation between WHO score and DBP
Descriptive Statistics

	Mean	Std. Deviation	N
who Score	14.34	5.514	149
DBP	74.905369	7.8131368	149

Correlations

		Who Score	DBP
who Score	Pearson Coefficient	1	.160
	Sig. (2- tailed)		.052
	Sum of Squares and Cross-Products	4499.927	794.757
	Covariance	30.405	5.407
	N	149	148
DBP	Pearson Coefficient	.160	1
	Sig. (2- tailed)	.052	
	Sum of Squares and Cross-Products	794.757	9034.676
	Covariance	5.407	61.045
	N	148	149

Table 3: Correlation between WHO score and MAP
Descriptive Statistics

	Mean	Std. Deviation	N
who Score	14.34	5.514	149
MAP= DAB + 1/3 PP	88.26	8.266	149

Correlations

		Who Score	MAP= DAB + 1/3 PP
who Score	Pearson Coefficient	1	.171
	Sig. (2- tailed)		.038
	N	149	148
MAP= DAB + 1/3 PP	Pearson Coefficient	.171	1
	Sig. (2- tailed)	.038	
	N	148	149

*Correlation is significant at the 0.05 level (2- tailed)

3. Results

The mean value of WHO score shows poor well-being among medical professionals

Table 1 and 3 summarizes negative correlation between SBP, MAP and well-being index, and the correlation is statistically significant.

Table 2 summarizes negative correlation between DBP and well-being index, but the correlation is not statistically significant.

4. Discussion

The current study examined the psychometric properties of the WHO-5 among medical professionals in a medical college in Kerala.

In the present study, the mean WHO-5 score was 57.36 ± 22.05 , which is lower than what was reported in a general population (64.74 ± 18.80) [13]. This implies that the medical professionals have poor well-being than the general population. This is similar to the findings of the publication in The British Medical Association (BMA) on a study on stress among junior and senior doctors [14]. The results of our study were comparable to a study done in India among PG trainees in which depression, anxiety and stress levels were found to be 27.71%, 36.58% and 24.24% respectively [15]

As observed in Tables 1 and 2, there was a negative correlation between BP and WHO 5 well-being index and it was statistically significant. This indicates that as the wellbeing decreases, BP increases. Similar findings were observed in a study conducted by Shet et al., the study was conducted in 155 software professionals from various software companies across Karnataka. [16]. If untreated, these professionals would go on to develop CVD at an early age.

Several studies have suggested that a hyperresponsiveness to mental stress may be the reason for the development of hypertension. Repeated stressors like work overload, sleep deprivation, inordinate working hours, frequent exposure to emotionally agitated situations, dealing with difficult patients, conflicts with other employees, etc. might influence vascular rigidity through different mechanisms. It could be a direct alteration of smooth muscle morphology and down regulation of the alpha receptor or through autoregulation of cardiac output, blood volume, and alterations in renal regulation of water and sodium balance.

Any kind of stress is known to raise the BP upto a certain extent. [17,18] The increase in BP occurs due to increased sympathetic activity. Stress can cause hypertension through repeated BP elevations, also by stimulation of the nervous system where there is an increased production of vasoconstrictors that increase BP. When one risk factor is coupled with other stress-producing factors, the effect on BP is multiplied. Overall, many studies show that stress does not directly cause hypertension but can have an effect on its development.

Limitations of the study are that first of all, it was a single-center study. Hence, the generalization of the results may be limited. Secondly, due to small sample size, correlation of Diastolic BP and stress was not statistically significant. Maybe larger sample size will yield a better picture of the situation.

This study shows that there is a negative effect on health and well-being of an individual with increasing stress levels among the medical professionals. This may be curbed by ensuring focused interventions like proper rest breaks, physical exercise, adequate sleep, and relaxation at home. These simple measures were suggested to the medical professionals to ensure good health and an optimum professional and personal life. Preventive strategies like training in stress management, frequent screening to identify professional stress and depression at the initial stages should be adopted. By addressing these issues adequately, we might help the medical professionals cope with their profession better without affecting their lifestyle and health leading onto reduced incidence of burnout.

5. Conclusion

The study decisively illustrates that medical professionals exhibit lower well-being scores, as per the WHO-5 Well-Being Index, when compared to the general population, a trend that alarmingly correlates with an increase in systolic blood pressure among the participants. This correlation underlines the profound impact of occupational stressors inherent in the healthcare profession, necessitating immediate and focused interventions. Such measures include the promotion of adequate rest, regular physical activity, and efficient stress management techniques. By addressing these concerns, there is a potential not only to enhance the well-being of medical professionals but also to alleviate the long-term risks associated with prolonged occupational stress, ultimately contributing to a healthier workforce capable of delivering optimal care.

References

- [1] "Stress" Mental Health America. 2013-11-18. Retrieved 2018-10-01.]
- [2] Sharma E. Role Stress among doctors. Journal of Health Management. April 2005;7(1):151-156]
- [3] Familoni OB. An overview of stress in medical practice. Afr Health Sci. 2008;8(1):6-7. 3. Balch CM, Freischlag JA, Shanafelt TD. Stress and Burnout Among Surgeons. Arch Surgery. Apr 2009;144(4):371-376]
- [4] WHO. (Five) Well-being Index. North Zealand, Hillerød, Denmark: Version Psychiatric Research Unit WHO Collaborating Centre in Mental Health; 1998
- [5] Hall T, Krahn GL, Horner-Johnson W, Lamb G: Rehabilitation Research and Training Center Expert Panel on Health Measurement: examining functional content in widely used health-related quality of life scales. Rehabil Psychol. 2011, 56:94-99. 10.1037/a0023054].
- [6] Barrett KE, Boitano S, Barman SM, Brooks HL. Ganong's Review of Medical Physiology. The

- Adrenal Medulla and Adrenal Cortex. 23th ed. United States: The McGraw-Hill Companies; 2010. p. 350
- [7] Karen AM, Kristen S, Sonya SB, Mighael TA. Cardiovascular reactivity to stress predicts future blood pressure in adolescence. *Psychosom Med* 2003;65:410-5.
- [8] Siegrist J, Peter R, Junge A, Cremer P, Seidel D. Low status control, high effort at work and ischemic heart disease: Prospective evidence from blue-collar men. *Soc Sci Med* 1990;31:1127-34.
- [9] Bosma H, Peter R, Siegrist J, Marmot M. Two alternative job stress models and the risk of coronary heart disease. *Am J Public Health* 1998;88:68-74
- [10] Light KC, Turner JR, Hinderliter AL. Job strain and ambulatory work blood pressure in healthy young men and women. *Hypertension* 1992;20:214-8.
- [11] Schnall PL, Schwartz JE, Landsbergis PA, Warren K, Pickering TG. A longitudinal study of job strain and ambulatory blood pressure: Results from a three-year follow-up. *Psychosom Med* 1998;60:697-706.
- [12] Mills KT, Bundy JD, Kelly TN, Reed JE, Kearney PM, Reynolds K, et al. Global disparities of hypertension prevalence and control: A systematic analysis of population-based studies from 90 countries. *Circulation* 2016;134:441-50.
- [13] Guðmundsdóttir HB, Ólason Dþ, Guðmundsdóttir DG, et al. (2014). A psychometric evaluation of the Icelandic version of the WHO-5. *Scand J Psychol*, 55(6): 567–72. [PubMed] [Google Scholar]
- [14] .[Felton J. Burnt Out as a clinical entity -its importance in health care workers. *Occup Med*. 1998;48:237–250. [PubMed] [Google Scholar]
- [15] [Dave S, Parikh M, Vankar G, Valipay SK. Depression, anxiety, and stress among resident doctors of a teaching hospital. *Indian J Soc Psychiatry* 2018;34:163-171. DOI: 10.4103/ijsp.ijsp_72_17]
- [16] Shet P, Bhat R, Ganaraja B, Nayanatara AK, Pai S. Evaluation of stress and its correlation with anthropometric parameters among software industry professionals. *Int J Innov Res Sci Eng Technol* 2014;3:9068-72.
- [17] Douglas C, George DS, Martin JS. Blood pressure reaction to acute psychological stress and future blood pressure status: A 10 Year old follow up of men in the white hall 2 study. *Psychosom Med* 2002;63:737-43.
- [18] Harshfield GA, Treiber FA, Davis H, Kapuku GK. Impaired stress induced pressure natriuresis is related to left ventricular structure in blacks. *Hypertension* 2002; 39:844-7.