RESEARCH ARTICLE

Assessment and correlation of the World Health Organization 5 well-being index and blood pressure in software professionals

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ABSTRACT

Background: India is a major player in the field of IT industry and employs more than half million people today who spend long stressful hours using the computer. Due to urbanization stress has now became an inescapable part of life, workplace has become a stress factory and it is rightly known as the age of anxiety. Hence, the aim of present study was to determine the level of stress using a simple tool like the World Health Organization (WHO) 5 well-being index and its effects on blood pressure (BP) at an early stage among software professionals. **Aims and Objectives:** To assess and correlate the WHO 5 well-being index and BP in software professionals. **Materials and Methods:** It was a cross-sectional study carried out among 60 software professionals within the age group of 25–35 years with 3 years of working experience in the same, working for 8–10 h a day. Known hypertensive and people with a family history of hypertension were excluded. BP was recorded using a sphygmomanometer, and the WHO 5 well-being index was calculated. **Results:** It was observed that there was a negative correlation though statistically not significant ($P > 0.05$) between BP and WHO 5 well-being index. **Conclusion:** As the level of stress increases, an increase in BP was noted with a subsequent decline in the well-being of the individual.

KEY WORDS: World Health Organization 5 Well-Being Index; Blood Pressure; Software Professionals

INTRODUCTION

In the 1990s, India emerged as a major player in the field of IT industry and is rapidly growing today. To propel this growth, the employees are spending long hours of stressful mental work. At present, the Indian information technology industry employs more than half million people. Due to urbanization that results into cut throat competition, stress is now an inescapable part of modern life. Workplace is becoming a volatile stress factory, and it is rightly called as the age of anxiety. Stress is man's adaptive reaction to an outward situation which would lead to physical mental and behavioral changes. Stress is one factor which may influence behavior and health, especially when an individual faces challenges that surpass his or her coping skills.[1]

Many of life's demands such as work, relationships, financial, and health problems could cause stress. Psychological stress may show up as headache, muscular ache, sleeping difficulties, eating disorders, memory impairment, fatigue, restlessness, agitation, or depression. The term stress as used in biology has been defined as any change in the environment that changes or threatens to change an existing optimal steady state. Chronic stress activate processes at the molecular, cellular, or systemic level in animals.[2]

The World Health Organization (WHO) defines mental health as "a state of well-being in which the individual realizes his

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or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community." In an organization or company, if a person has to meet the goals of job, he should have a sound mental balance. Individual should have well-balanced emotions to deal with the pressures of the work life. A person with good mental health will perform efficiently at work and also in life as a whole.[3]

Chronic stress can lead to poor well-being of a person. Poor well-being in long term can lead to depression which is another major health issue leading to increased absenteeism, negative impact on productivity, and profits. In addition, poor well-being impact employee morale adversely.[4]

Any kind of stress is known to increase the blood pressure (BP) up to a certain extent which occurs due to increase in sympathetic activity[5] and has a definite association with cardiovascular diseases (CVD).[6,7] This association could be derived from detrimental effects on BP by recurrent autonomic system reactivity to work-related stressors.[8,9]

Very few studies are available which show association between well-being and BP.

Hence, the aim of present study was to determine the level of stress using simple tool like the WHO 5 well-being index and its effects on BP at an early stage among software professionals. Reason for selection of such volunteers was owing to their stressful nature of work due to unachievable targets.

MATERIALS AND METHODS

It was a cross-sectional study conducted on software professionals in software companies in Pune. After the Institutional Ethical Committee approval was obtained 60 people were selected randomly as per the inclusion and exclusion criteria.

Volunteers in the age group between 28 and 35 years having at least 3 years of working experience in software company and daily working of minimum 8–10 h were included in the study. 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 assessment of stress or psychological well-being, a simple screening tool, i.e., the WHO-5 well-being index was used. The WHO-5 well-being index[10] is a short, self-administered questionnaire covering five positively worded items, related to positive mood (good spirits, relaxation), vitality (being active and waking up fresh and rested), and general interests (being interested in things). It has shown to be a reliable measure of emotional functioning and a good screener for depression. Administering the WHO-5 well-being index

takes 2–3 min and can be integrated in clinical routine, both in primary and secondary care.

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 worst possible and 25 representing 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, it is an indication for further assessment to confirm depression.

Systolic BP (SBP) and diastolic BP (DBP) was measured in the right arm in supine position using a mercury-column sphygmomanometer positioned near heart level after 10 min of physical and mental rest.[11]

According to the information collected, the data were analyzed using percentage and correlation coefficient test. $P < 0.05$ was considered as statistically significant.

RESULTS

Table 1 summarizes negative correlation between SBP and well-being index, but the correlation is not statistically significant. Table 2 summarizes negative correlation between DBP and well-being index, but the correlation is not statistically significant.

DISCUSSION

As observed in Tables 1 and 2, there was negative correlation though statistically not significant between BP and WHO 5 well-being index. This indicates that as BP increases well-being decreases.

Similar findings were observed in a study conducted by Shet *et al.*, the study was conducted in 155 software professionals working in different software companies across Karnataka.[12]

Nayak in the study compared well-being of software professionals and mechanical professionals. He found that the software professionals working in different software organizations and companies of Karnataka state, India, showed more anxiety and poor well-being as compared to mechanical profession.[3]

In the present study, hypertension was not found in the study population.

Babu *et al.* conducted the study among 1071 software professionals employed at 27 different companies in Bangalore and studied the prevalence of hypertension

Table 1: Correlation of SBP with the WHO 5 well-being index in the study population

SBP (mm of Hg) (mean±SD)	Well-being index (mean±SD)	*r* value	*P* value
129.53±16.04	16.4±4.18	−0.11839	>0.05

SBP: Systolic blood pressure, WHO: World Health Organization, SD: Standard deviation

Table 2: Correlation of DBP with the WHO 5 well-being index in the study population

DBP (mm of Hg) (mean±SD)	Well-being index (mean±SD)	*r* value	*P* value
82.23±8.25	16.4±4.18	−0.11177	>0.05

DBP: Diastolic blood pressure, WHO: World Health Organization, SD: Standard deviation

among them.[13] They suggested that hypertension in software professionals occurs a decade earlier compared to the rest of India and two decades earlier compared to developed countries.[14] This suggests that if untreated, these professionals would go on to develop CVD at an early age. The results also indicated that 46% of professionals were in prehypertension. According to the Joint National Committee-VII classification, prehypertension is not a disease category but a designation chosen to identify individuals at high risk of developing hypertension.[15]

Any kind of stress is known to increase the BP up to a certain extent.[16,17] The increase in BP occurs due to increase in sympathetic activity.[5] Stress can cause hypertension through repeated BP elevations as well as by stimulation of the nervous system to produce large amounts of vasoconstrictors that increase BP. Factors affecting BP through stress include white-coat hypertension, job strain, race, social environment, and emotional distress. Furthermore, when one risk factor is coupled with other stress-producing factors, the effect on BP is multiplied. Overall, studies show that stress does not directly cause hypertension but can have an effect on its development.

The study concludes that there is negative correlation between BP and well-being index though it was not statistically significant.

This study shows that there is a negative effect on health and well-being of an individual with increasing stress levels which may be curbed by ensuring proper rest breaks, physical exercise, adequate sleep, and relaxation at home. Thus, the above simple measures were suggested to the individuals to ensure good health and an optimum professional and personal life. Preventive strategies such as training in stress management, frequent screening to identify professional stress, and depression at the initial stages and addressing these issues adequately might help the software professionals cope with their profession better without affecting their lifestyle and health.

Limitation of the study is that due to small sample size correlation was not statistically significant. Maybe larger sample size will yield more clear picture of the situation.

CONCLUSION

As the level of stress increases, an increase in BP was noted with a subsequent decline in the well-being of the individual.

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