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SCREENING OF PRE-HYPERTENSION RISK FACTORS AMONG TEACHING PROFESSIONALS

Nigel Gonsalves*[1], Amita Aggarwal[2], Dr. Tushar J. Palekar PhD.[3] and Chetna Jadhav[4]

[1]Post-Graduate Student, Dr. D.Y. Patil College of Physiotherapy, Pune – 18.

[2]Assistant Professor, Dr. D.Y. Patil College of Physiotherapy, Pune – 18.

[3]Principal and Professor, Dr. D.Y. Patil College of Physiotherapy, Pune – 18.

[4]Post-Graduate Student, Dr. D.Y. Patil College of Physiotherapy, Pune – 18.

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***Corresponding Author**
Nigel Gonsalves
Post-Graduate Student, Dr. D.Y. Patil College of Physiotherapy, Pune – 18

ABSTRACT

Introduction: Pre - Hypertension is defined as a systolic blood pressure between 120mm Hg and 139 mm Hg or diastolic blood pressure between 80 and 89 Hg. As Teachers comprise a large and growing segment of the workforce in many countries, this study is an effort to identify risk factors associated with work overload in teaching profession for developing cardio-vascular disorders such as pre-hypertension. **Aim and Objectives: Aim:** To screen for pre hypertension and its associated risk factors in teaching professionals. **Objective:** To find out the core risk factors for pre-hypertension in teaching professionals. **Material and Methods:** An analytical survey was conducted according to a simple cluster sampling. 50 teaching professionals were selected after taking written informed consent. A questionnaire was administered. Blood pressure and B.M.I. was measured. **Results:** 94% of subjects reported in the range of pre-hypertension. **Conclusion:** Pre-hypertension was found very high among teaching professionals. It can be due to work related stress though addictions and sedentary lifestyle also adds as risk factors.

KEYWORDS: Pre-Hypertension, Teaching Professionals.

INTRODUCTION

Hypertension is most likely the most common disease worldwide in the year 2000 it was found that 26.4% of the world's adult population had hypertension and it is expected that by the year 2025, approximately 1 in 3 adults aged over 20 years will have the disease. It represents the single greatest preventable cause of death in humans as well as one of the most

important modifiable risk factors for cardiovascular diseases. Blood pressure and cardiovascular risk was found to have a direct positive relationship which is strong, continuous, graded, consistent, independent, predictive, and etiologically significant for those with and without coronary heart disease.[1]

According to 7th Joint National Committee on the Prevention, Detection, Evaluation and Treatment of High Blood Pressure, hypertension is defined as systolic blood pressure above 140 mm Hg and diastolic blood pressure above 90 mm of Hg. Recently the 7th Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure also introduced the term "pre-hypertension" for systolic blood pressure levels of 120 to 139 mm Hg and diastolic BP levels of 80 to 89 mm Hg.[2] Studies have shown that blood pressure in the pre-hypertensive range precede the diagnosis of hypertension in 90% of subjects aged ≥ 55 years and that patients with pre-hypertension are at twice the risk to develop hypertension as those with lower values.[1]

In India, hypertension is the leading non-communicable disease causing 10% of deaths. In urban areas the prevalence of hypertension was between 20-40% while in rural areas it was between 12 to 17%.[3] Another study published in 2016 in India, found that 42% of the individuals were hypertensive.[4]

Among risk factors for hypertension, stress, especially work stress, has drawn increasing attention over the past many years. Examples of stressful occupational activities are firefighting or school teaching.[1] A 2001study, found that the estimated relative risk of arterial HTN for female teachers was 1.5 compared with other female employees (designers, researchers) served as controls. This finding can classify teaching occupation as high risk for arterial hypertension.[5]

A study in Jeddah carried out in 2006-07 among preparatory and secondary school teachers found that less than one third (31.8%) of teachers were normotensive, 43.0 % were pre-hypertensive and the overall prevalence of hypertension was 25.2 %. Among the diagnosed hypertensive cases only less than of third (30.4%) were aware of being hypertensive.[1] There was a very poor awareness of the prevalence of hypertension among the preparatory and secondary school teachers in Jeddah.[1]

Another study in Turkey published in 2016, noted that one of every five teachers working in primary - secondary levels were hypertensive. Among the hypertensives teachers, 6.9% were not aware about their status. Approximately one-third of teachers were found to be pre-hypertensive.[6]

In a study, done at Warangal, Andhra Pradesh on school teachers found that 24% of teachers were normotensive, 45% were pre-hypertensive and 4% were hypertensive.[7]

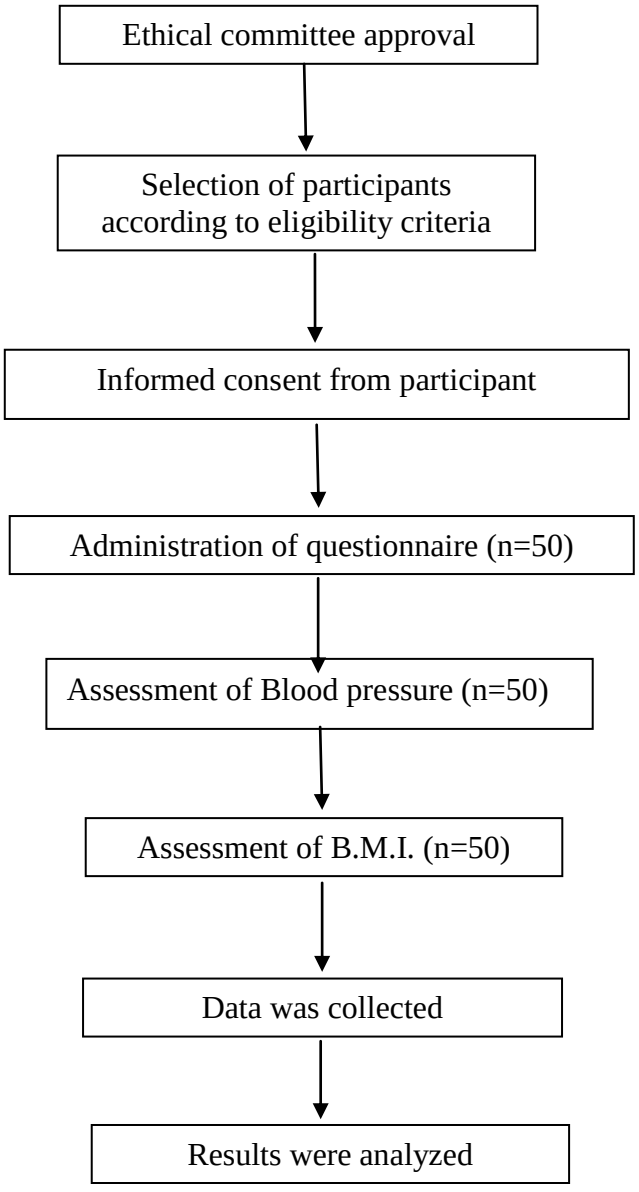
At present, there are very few studies to discuss about pre-hypertension in teaching professionals. There are few studies done among teaching professionals to assess for pre-hypertension in an Indian population. This study was a sincere attempt to find out the prevalence of pre-hypertension among teaching professionals in an Indian population. The main aim of the study was to screen for pre- hypertension and its associated risk factors in teaching professionals. The main objective of the study was to find out the core risk factors for pre-hypertension in teaching professionals.

MATERIALS AND METHODOLOGY

An ethical committee approval was taken from Dr. D.Y. Patil College of Physiotherapy, Pune. All participants fulfilling the inclusion criteria were included in the study. Those included were teaching Professionals with minimum experience of 7 years, participants from both genders with an age of 35 to 50 years. Those excluded were pregnant women, individuals with unstable angina or individuals with any other cardio-vascular abnormality. An analytical survey was done to screen for hypertension among teaching professionals. Participants were included from many educational institutes from Pimpri - Chinchwad.

A simple cluster sampling was done to recruit the participants in the study. A total of 50 participants participated in the study. An informed consent was taken from all the participants. A questionnaire was designed to assess for hypertension and its risk factors in teaching professionals. It was validated by a team of experts with a minimum of 5 years experience in teaching or research. The questionnaire was administered to the participants. As shown in Figure 1. The questionnaire contained questions on presence of any past history of hypertension or any other disease or disorder, a detailed occupational history, family history of hypertension or any other disease or disorder, history of addictions, lifestyle history, history of any emotional disturbance or stress and presence of any associated signs or symptoms.

A mercury sphygmomanometer was used to measure the blood pressure and a stethoscope was used to auscultate the pulse of the brachial artery. Blood pressure was assessed with the subject in sitting position with the forearm supported by the arm of the chair and cuff placed above the elbow joint. Care was taken so that the sleeve of the participant was not simply rolled up in order to gain access to the arm; as it could create a tourniquet effect above the cuff. When the cuff was [placed on the arm, the midline of the inflatable bladder was positioned over the brachial artery (the artery coursing between the biceps and triceps muscles, on the medial aspect of the arm) at the mid-point of the upper arm. The lower-most edge of the cuff was at a distance of minimum 1 inch (2.5 cm) above the cubital crease so that the bell (preferred) or the diaphragm of the stethoscope could be placed over the point of the strongest palpable brachial artery pulse in the cubital fossa without encroaching beneath the cuff.[8,9]



When the blood pressure was measured care was taken to support the arm so that the cuff was at the level of the right atrium with the arm straight and cubutal fossa facing 'upwards'.[8]

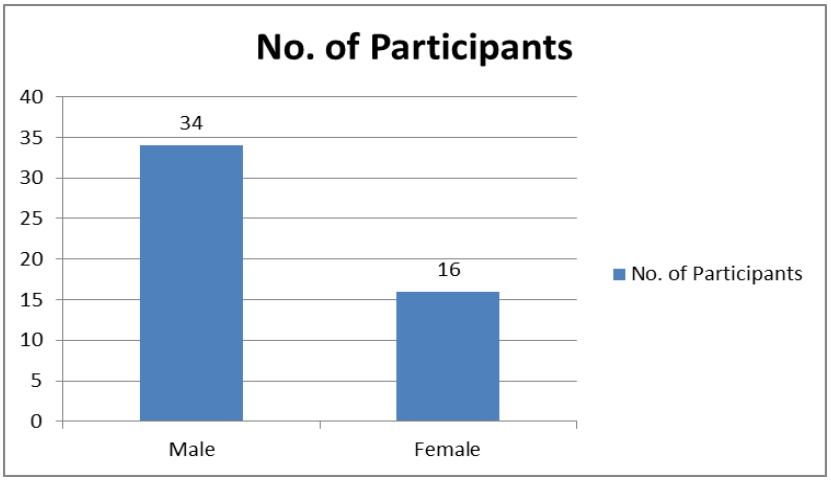
Figure. 1: Administration of questionnaire to participant.

In order to avoid over inflation of the cuff, and to accommodate any systolic auscultatory gap, the maximum inflation point was estimated by palpating the radial pulse while incrementally inflating the cuff until the pulse disappears. The therapist then waited for at least one minute after deflating the cuff before reinflating the cuff to 30 mm Hg above the point where the pulse previously disappeared. Alternatively, another method used was to auscultate the brachial artery while incrementally inflating the cuff to 30 mm Hg above the point at which the tapping noise (Korotkoff sounds) disappears. The cuff was deflated at the rate of 2 mm Hg per second (or per pulse when the heart rate is below 60 beats per minute). Systolic blood pressure was recorded as the point at which auscultatory pulsations (Korotkoff phase I) are heard as the cuff is deflated. The disappearance of the auscultatory pulsations (Korotkoff phase V) was recorded as the diastolic pressure in the participants. The blood pressure was read to the nearest 2 mm Hg when using the mercury sphygmomanometer.[8]

The body mass index (B.M.I.) was also assessed with height in meters and weight in kilograms. Weight measured using a weighing scale and height was measured using a stadiometer.[10] The data was collected and results were analyzed.

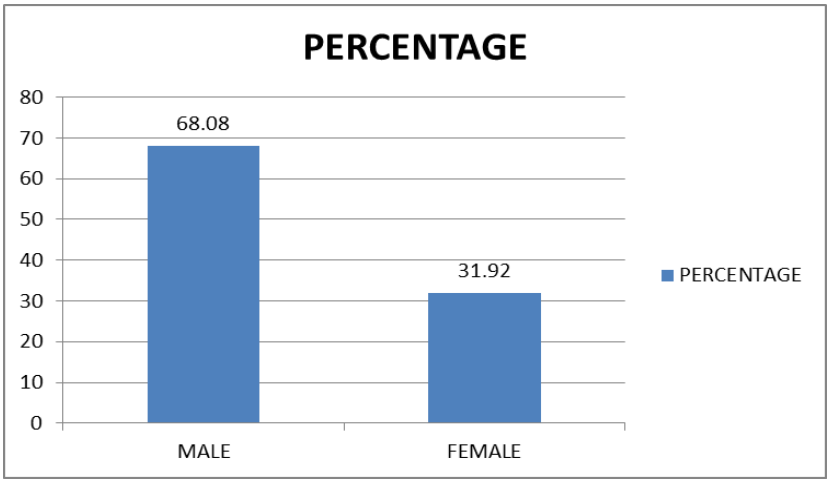
RESULTS

50 participants took part in the study. All 50 participants responded to each section of the questionnaire. Blood pressure and BMI was assessed of each participant.



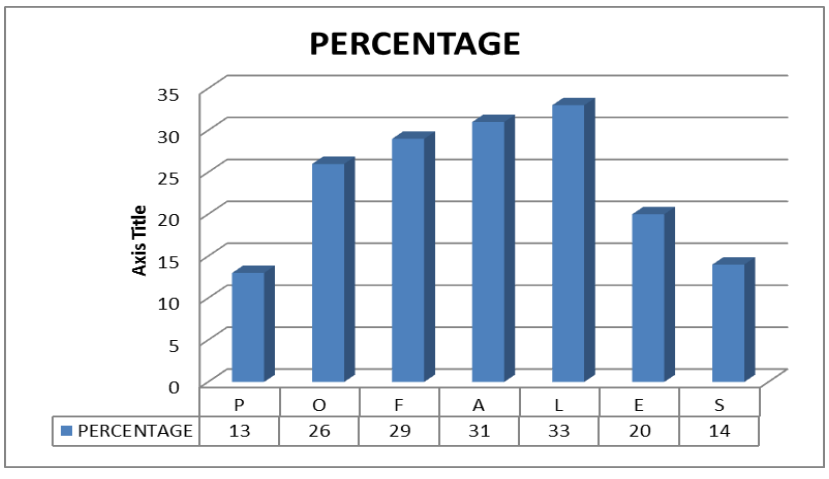
Graph 1: Gender wise distribution of participants.

In Graph 1, For n=50, 34 Males and 16 Females participated in the study



Graph. 2: Gender wise Percentage distribution of Pre-Hypertension.

In Graph 2, for n=47, 68.08% were males and 31.92% were females who were pre-hypertensive.



Graph. 3: Risk Factor analysis for pre-hypertension.

In graph 3, P=Past history, O=Occupation, F= Family History, A=Addictions, L=Lifestyle, E=Emotions, S=Associated Symptoms.

According to graph3, for n=47 pre-hypertensive participants, prevalence of pre-hypertension in teaching professionals due to various risk factors. 33% gave a history of a sedentary and inactive lifestyle, 31% gave a history of addictions which included alcohol consumption, smoking or any other drug abuse, 29% gave a family history of hypertension while 26% of the participants reported occupational stress.

DISCUSSION

From 50 subjects, 94% reported in the pre-hypertension range. Occupational and psychological stress due to job profile, peer support, working environment has been seen as causative factor of hypertension. Nahla K. et al in Jeddah, published an article on prevalence of prehypertension and hypertension among Preparatory and Secondary School Teachers and found 43.0 % to be pre-hypertensive and 25.2 % to be hypertensive.[1] Thus, they too found similar results to our study. Also, Yilmazel G. et al found one of every five teachers working in primary - secondary levels to be hypertensive. This study was carried out among primary-secondary school teachers in Turkey.[6] The results of this study were also quite similar to our study. In an Indian scenario, Vijayakumar S. et al in a study in Warangal, Andhra Pradesh found 45% of the teachers to be pre-hypertensive and 4% teachers to be hypertensive.[7] This study, also showed results similar to our study. Thus, occupational and psychological stress due to job profile, peer support, working environment has could be a causative factor for hypertension among teaching professionals.

Schrier R. et al said that in Diabetes type 2, insulin resistance develops leading to increased sympathetic activity resulting in increased blood pressure.[11] Also, Kotosis V. et al have proved that high dietary content in fat and carbohydrate stimulates α_1 or β adrenergic receptors leading to elevated sympathetic activity thus increased blood pressure.[12] Kotosis V. et al also have found that several studies tend to show predominantly high levels of plasma renin activity, plasma angiotensinogen, Ang II and aldosterone values in association with human obesity. Thus, leading to hypertension.[12] Similarly, Robertson R. et al say that orthostatic hypotension is one of the common manifestations of blood pressure dysregulation. It impairs quality of life severely. It can also lead to hypertension.[13] In another study, Bollinder G. et al found that smokeless tobacco users and smokers showed higher prevalences of circulatory and respiratory disorders, of which--hypertension was the most

common in smokeless tobacco users.[14] Congenital abnormalities- Liddle's syndrome and pseudoaldosteronism cause genetic mutations this incidence is very small but correlates with family history as a core risk factor of hypertension. Wang LP. Et al says that Liddle syndrome is an autosomal dominant form of monogenic hypertension, which has been regarded as a rare disorder, leads to many Liddle syndrome patients being misdiagnosed and experiencing severe complications at an early age. This is generally screened with genetic testing.[15] Similarly, Shimkets R. et al stated that Liddle's syndrome (pseudoaldosteronism) is an autosomal dominant (genetic cause) form of human hypertension characterized by a constellation of findings suggesting constitutive activation of the amiloride-sensitive distal renal epithelial sodium channel. They demonstrated complete linkage of the gene encoding the β subunit of the epithelial sodium channel to Liddle's syndrome. Analysis of this gene revealed a premature stop codon that truncates the cytoplasmic carboxyl terminus of the encoded protein in affected subjects.[16]

Aerobic exercises tend to reduce blood pressure in both hypertensive and normotensive persons. An increase in physical activity should be considered an important component of lifestyle modification for prevention and treatment of high blood pressure.[17] Lifestyle modifications and diet can effectively help to improve pre hypertension and hypertension.[18] Thus, physical activity, lifestyle modifications and diet could be recommended for teaching professionals as a whole. These precautionary measures should be taken to prevent the occurrence of pre- hypertension and hypertension among teaching professionals.

This study has studied the various core risk factors for hypertension among teaching professionals. We strongly advice teaching professionals to indulge in increased physical activity implement lifestyle modifications and follow dietary advice to prevent hypertension.[17,18]

Some of the limitations of the study were that the sample size was too small, assessment of blood pressure could be done at multiple times during a day and repeated on two to three different days at the same time, a thorough evaluation of other causative factors with the use of medical reports were not done.

Further recommendations for the study could be to increase the sample size, assessment of blood pressure could be done at multiple times during a day and repeated on two to three

different days at the same time, a thorough evaluation of other causative factors with the use of medical reports could be done.

CONCLUSION

Pre-Hypertension was found to be very high among teaching professionals in the study settings studied. This was mainly due to work related stress though addictions and sedentary lifestyle also adds as risk factors.

REFERENCES

1. Nahla K. Nariman A., Adnan A. Prevalence and Determinants of prehypertension and Hypertension among Preparatory and Secondary School Teachers in Jeddah; J Egypt Public Health Assoc, 2008; 83(3-4): 183-203.
2. Chobanion AV, Bakris G, Cushman W, et al. The seventh report of the joint national committee on prevention, detection, evaluation and treatment of high blood pressure. p. 2
3. Mohan S, Campbell N,, Chockalingam A. Time to effectively address hypertension in India.I ndian J Med Res., 2013 Apr; 137(4): 627–631.
4. Banerjee S., Mukherjee T., Basu S.; Prevalence, awareness, and control of hypertension in the slums of Kolkata; 2016; Indian Heart J., 2016 May-Jun; 68(3): 286–294.
5. Fauvel J, Quelin P Ducher M et al. Perceived job stress but not individual cardio-vascular reactivity to stress is related to higher blood pressure at work; Hypertension, 2001 Jul; 38(1): 71-5.
6. Yilmazel G., Cetinkaya F.; Pre-Hypertension and hypertension among primary-secondary school teachers in Çorum: results from a Turkish cross-sectional study; Medicine Science, 2016; 5(3): 797-804.
7. Vijayakumar S, Laxmi A, Pasula A et al. Prevalence, awareness and control of hypertension in school teachers in Warangal, Andhra Pradesh, India. Int J Biol Med Res., 2013; 4(2): 3247- 3249.
8. Frese E., Fick A., Sadowsky H.; Blood Pressure Measurement Guidelines for Physical Therapists; Cardiopulm Phys Ther J., 2011 Jun; 22(2): 5–12.
9. Eser I., Khorshid L, Gunes U., Demir Y.; The effect of different body positions on blood pressure; J Clin Nurs, 2007 Jan; 16(1): 137-40.
10. Nuttall F.; Body Mass Index Obesity, BMI, and Health: A Critical Review; Nutr Today, 2015 May; 50(3): 117–128.

11. Schrier R, Estacio R, Mehler P et al. Appropriate blood pressure control in hypertensive and normo- tensive type 2 diabetes mellitus: a summary of ABCD trial; Nat Clin Pract Nephrol, 2007 Aug; 3(8): 428-38.
12. Kotosis V, Stabouli S, Papakatsika S et al. Mechanisms of obesity – induced hypertension; Hypertension Research, 2010; 33: 386–393.
13. Robertson R. The pathophysiology and diagnosis of orthostatic hypotension. Clin Auton Res., 2008.
14. Bollinder G., Ahlborg B., Lindell J.; Use of smokeless tobacco: blood pressure elevation and other health hazards found in a large-scale population survey; JIM., October 1992; 232(4): 327–334.
15. Wang LP., Yang KQ., Jiang XJ., Wu HY., Zhang HM., Zou YB., Song L., Bian J., Hui RT., Liu YX., Zhou XL.; Prevalence of Liddle Syndrome Among Young Hypertension Patients of Undetermined Cause in a Chinese Population; J Clin Hypertens (Greenwich), Nov., 2015; 17(11): 902-7.
16. Shimkets R., Warnock D., Bositis C., Nelson-Williams C., Hansson J., Schambelan M., Gill J., Ulick S., Milora R., Findling J., Canessa C., Rossier B., Lifton R.; Liddle's syndrome: Heritable human hypertension caused by mutations in the β subunit of the epithelial sodium channel; Cell; Volume 79, Issue 3, 4 November 1994, Pages 407-414.
17. Whelton S; Ashley Chin A.; Xin X.; He J.; Effect of Aerobic Exercise on Blood Pressure: A Meta-Analysis of Randomized, Controlled Trials; Ann Intern Med., 2002; 136(7): 493-503.
18. Elmer P.; Obarzanek E.; Vollmer W.; Simons-Morton D.; Stevens V.; Young D.; Lin P.; Champagne C.; Harsha D.; Svetkey L.; Ard J.; Brantley P.; Proschan M.; Erlinger T.; Appel L.; for the PREMIER Collaborative Research Group; Effects of Comprehensive Lifestyle Modification on Diet, Weight, Physical Fitness, and Blood Pressure Control: 18-Month Results of a Randomized Trial; Ann Intern Med., 2006; 144(7): 485-495.