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Research Article

# LIFESTYLE FACTORS: AN ALARM TOWARDS HYPERTENSION

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**ABSTRACT**

Cardiovascular disease is the number one cause of death worldwide in which hypertension is responsible for an annual death of 7.1 million. There exist a causal relationship between low levels of occupational and/or leisure-time Physical Activity and an increased risk of cardiovascular disease. An additional possible reasons may be reduced sleep duration/quality and individuals knowledge of their disease and its treatment.

Objective: This study was conducted to assess the prevalence of hypertension and risk factors associated, concentrating on literacy status, physical exercise, occupation and sleep pattern in rural population.

Method: It was a questionnaire based study carried out in two phases with Blood Pressure measurement.

Result: The study results showed low literacy rate and maximum prevalence of hypertension in farmers and house wives, with a lifestyle devoid of routine physical exercises and with advancing age.

Conclusion: The study concluded with the positive relationship between risk factors.

**Keywords:** Hypertension, Physical Exercise, Literacy, Occupation, Risk Factors.

## INTRODUCTION

Cardiovascular disease is the number one cause of death in the western world and one of the leading causes of death worldwide in which hypertension is an important public health concern worldwide being responsible for an annual death of 7.1 million people [1,2]. Rural areas in India are in transitional phase this increases the risk of conditions like Hypertension [3]. Studies estimated the prevalence rate of hypertension in India to be around 25% - 30% of urban and 10% -15% of rural adults [4]. Hypertension being the commonest cardiovascular disorder, posing a major public health challenge to population in socioeconomic and epidemiological transition, hypertension has been well recognized as a major independent risk factor for cardiovascular disease and stroke [5,3]. As Hypertension is often asymptomatic, many persons are unaware of their condition, detection and control of BP is therefore an important public health challenge [6].

It is becoming an increasingly common health problem because of increasing longevity and prevalence of contributing factors such as obesity, physical inactivity, stress and unhealthy diet [7].

Modern humans are immersed within an environment explicitly designed to eliminate physical labour as a result, sedentary lifestyles have become a predominant and pervasive feature. The confluence of passive transportation, spectator-based entertainment and reduction in energy expenditure via occupational and household physical activity has lead to an increase in cardiovascular disease (CVD). Because human cardiovascular (CV) physiology evolved within an environment that obligated prodigious amounts of energy expenditure via physical exertion, it is not surprising that a lack of Physical Activity has induced a host of morbidities. Over the past 5 decades, a substantial accumulation of epidemiological and experimental data has established a causal relationship between low levels of occupational and/or leisure-time Physical Activity (i.e., a sedentary lifestyle) and an increased risk of CVD. The American Heart Association has also concluded that a sedentary lifestyle is a major modifiable risk factor for CVD [8].

Physical Activity and exercise when used as part of the medical management plan for secondary disease prevention will almost improve the quality of life and potentially extend the life of diseased individual [9]. Several epidemiological studies and clinical trials suggest that any type of physical activity reduces the risk of developing coronary heart disease, stroke as well as various metabolic disorders like hypertension, diabetes, overall cardiovascular morbidity and mortality [10-12].

According to the American Heart Association most patients with other manifestations of cardiovascular diseases should be assisted to perform at least 150 minutes of moderate-intensity (40-60% of maximal capacity) exercise per week, with no more than two consecutive days without physical activity, an additional possible explanation for the epidemic of cardiac diseases is reduced sleep duration and quality. Unfortunately, most epidemiologic studies cannot distinguish between voluntary sleep curtailment and sleep loss due to a pathological condition. Therefore, it is not clear if long sleepers are actually obtaining more physiologic sleep or if they are just spending more time in bed [11,13]. Chronically restricted sleep is a widespread and serious problem in our society, it is important to note that some studies found no significant risk of cardiovascular mortality associated with short sleep. Occupation has traditionally been used as an indicator of socioeconomic status, and work characteristics such as high work demands and low control over job duties and low use of skills have been investigated [14-16].

Moreover, most of these studies are conducted on the urban population and do not report about risk factors in rural population since the life style differs vastly in the two groups. Hence, studies are needed in rural areas to have a base line data about the prevalence of hypertension and its association with the risk factors. Preventive strategies have to be planned for the rural areas, simple life style modifications in the rural areas may change the scenario triggering to initiation of preventive strategies for the rural area [17]. With escalating need as per current scenario, this study was conducted to assess the prevalence of hypertension and risk factors associated, emphasizing on literacy status, physical exercise, occupation and sleep pattern in rural India.

## MATERIALS AND METHODS

### Study Materials

- Patient questionnaire
- Patient Information Leaflets.

- Sphygmomanometer.
- Stethoscope.

**Method of Data Collection**

This study was conducted in four rural villages Chunchanahalli, Arni, Mavinakere and Kanchanahalli of Mandya and Tumkur District, Karnataka. Questionnaires were employed for each individual who gave their consent to participate in the study, trained study staff administered a structured questionnaire, performed Blood Pressure measurement and counselled the patients about the disease and assessed the risk factors associated with hypertension. The questionnaire used in the study was developed from other validated questionnaires and other technical publications using expert advice from a range of sources. The questionnaire was stabilized through a pilot study conducted prior. The pilot study was performed to stabilize the questionnaire as per the current research environment and to enhance the reliability and validity of the study. The questionnaire sought information on socio-demographic variables (including education level, physical activity, sleeping hours and occupation), cardiovascular risk factors and current treatments. Statistical analysis was performed using MS Excel, SAS version 9.2.

**RESULT**

**LITERACY STATUS DISTRIBUTION**

**Table1: Literacy Status (In Percentage)**

| | Percentage Distribution | | | | | | |
|---|---|---|---|---|---|---|---|
| **Literacy** | **Stage I** | **Stage II** | **Low** | **Normal** | **Pre-Hypertension** | **Systolic Hypertension** | **Total** |
| Graduate | 0.52 | 1.03 | 0.26 | 1.55 | 2.84 | 0.26 | 6.44 |
| High School | 2.32 | 1.55 | 0 | 12.63 | 11.08 | 0.52 | 28.09 |
| Illiterate | 5.67 | 6.7 | 0.26 | 13.92 | 16.75 | 2.32 | 45.62 |
| Primary | 3.09 | 2.06 | 0 | 8.51 | 5.93 | 0.26 | 19.85 |
| Total | 45 | 44 | 2 | 142 | 142 | 13 | 388 |
| | 11.6 | 11.34 | 0.52 | 36.6 | 36.6 | 3.35 | 100 |

Table 1 shows the prevalence of low level of literacy (45.62% Illiterates) amongst the study population and prevalence of hypertension amongst the same.

**OCCUPATION WISE DISTRIBUTION**

**Table2: Occupation Status (In Percentage)**

| | Percentage Distribution | | | | | | |
|---|---|---|---|---|---|---|---|
| **OCCUPATION** | **Stage I** | **Stage II** | **Low** | **Normal** | **Pre-Hypertension** | **Systolic Hypertension** | **Total** |
| Business | 0.26 | 0.26 | 0 | 2.06 | 1.55 | 0 | 4.12 |
| Farmer | 5.93 | 4.9 | 0 | 17.78 | 17.53 | 2.32 | 48.45 |
| Govt. Emp. | 0.52 | 1.29 | 0 | 1.8 | 2.58 | 0 | 6.19 |
| House Wife | 3.87 | 4.12 | 0.52 | 10.82 | 8.51 | 1.03 | 28.87 |
| Pvt. Emp. | 0 | 0 | 0 | 2.06 | 2.58 | 0 | 4.64 |
| Retired | 1.03 | 0.77 | 0 | 2.06 | 3.87 | 0 | 7.73 |
| Total | 45 | 44 | 2 | 142 | 142 | 13 | 388 |
| | 11.6 | 11.34 | 0.52 | 36.6 | 36.6 | 3.35 | 100 |

Occupation distribution (Table 2,) showed that majority of study population were Farmers (48.45%) and House Wives **(**28.87%**)** which showed a high prevalence of hypertension as well.

**PHYSICAL EXERCISE WISE DISTRIBUTION**

**Table3: Physical Exercise (In Percentage)**

| **Physical Exercise** | **Stage I** | **Stage II** | **Low** | **Normal** | **Pre-Hypertension** | **Systolic Hypertension** | **Total** |
|---|---|---|---|---|---|---|---|
| No | 6.72 | 6.46 | 0.52 | 21.96 | 23.26 | 2.84 | 61.76 |
| Yes | 4.91 | 4.91 | 0 | 14.73 | 13.44 | 0.26 | 38.24 |
| Total | 45 | 44 | 2 | 142 | 142 | 12 | 387 |
| | 11.63 | 11.37 | 0.52 | 36.69 | 36.69 | 3.1 | 100 |

Physical Exercise (Table 3) distribution showed that study population who were not practicing physical exercise (61.76%) showed highest prevalence hypertension.

**SLEEPING HOURS WISE DISTRIBUTION**

**Table 4: Sleeping Hours (In Percentage)**

| **SLEEPING HOURS** | **Stage I** | **Stage II** | **Low** | **Normal** | **Pre-Hypertension** | **Systolic Hypertension** | **Total** |
|---|---|---|---|---|---|---|---|
| 6-8hours | 5.68 | 4.91 | 0.26 | 20.41 | 24.29 | 1.81 | 57.36 |
| ≤ 6hours | 3.88 | 1.29 | 0.26 | 7.49 | 5.94 | 1.03 | 19.9 |
| ≥ 8Hours | 2.07 | 5.17 | 0 | 8.79 | 6.46 | 0.26 | 22.74 |
| Total | 45 | 44 | 2 | 142 | 142 | 12 | 387 |
| | 11.63 | 11.37 | 0.52 | 36.69 | 36.69 | 3.1 | 100 |

The population distribution of sleep showed that most of the study population affected from hypertension and the risk of development of hypertension (pre-hypertension) was highest amongst 6-8 hours sleep (12.4% and 24.29% respectively).

**Table 5: Age Vs Sleeping Hours (≤ 6hours) Vs Blood Pressure (In Percentage)**

| AGE | Stage I | Stage II | Low | Normal | Pre-Hypertension | Systolic Hypertension | Total |
|---|---|---|---|---|---|---|---|
| 30 - 39 | 0 | 2.6 | 0 | 14.29 | 6.49 | 0 | 23.38 |
| 40 - 49 | 5.19 | 0 | 0 | 14.29 | 10.39 | 1.3 | 31.17 |
| 50 - 59 | 3.9 | 1.3 | 1.3 | 2.6 | 2.6 | 1.3 | 12.99 |
| 60 - 69 | 5.19 | 0 | 0 | 3.9 | 5.19 | 1.3 | 15.58 |
| 70 - 79 | 2.6 | 1.3 | 0 | 2.6 | 1.3 | 0 | 7.79 |
| 80 + | 2.6 | 1.3 | 0 | 0 | 3.9 | 1.3 | 9.09 |
| Total | 15 | 5 | 1 | 29 | 23 | 4 | 77 |
| | 19.48 | 6.49 | 1.3 | 37.66 | 29.87 | 5.19 | 100 |

When sleep ≤ 6 hours (Table. 5) was compared with age and hypertension prevalence showed that population aged 40-49 years (31.17%) were mostly affected with pre-hypertension (10.39%) and Stage I Hypertension(5.19%) followed by 60-69 years (5.19% pre-hypertensive and 5.19% Stage I hypertensive).

**Table 6: Age Vs Sleeping Hours (6-8 hours) Vs Blood Pressure (In Percentage)**

| AGE | Stage I | Stage II | Low | Normal | Pre-hypertension | Systolic Hypertension | Total |
|---|---|---|---|---|---|---|---|
| 30 - 39 | 2.7 | 0 | 0.45 | 17.12 | 14.41 | 0 | 34.68 |
| 40 - 49 | 1.35 | 1.8 | 0 | 7.66 | 8.11 | 0 | 18.92 |
| 50 - 59 | 1.35 | 2.25 | 0 | 4.95 | 6.76 | 0 | 15.32 |
| 60 - 69 | 1.8 | 3.15 | 0 | 2.25 | 6.31 | 1.8 | 15.32 |
| 70 - 79 | 0.9 | 0.9 | 0 | 1.8 | 1.8 | 0 | 5.41 |
| 80 + | 1.8 | 0.45 | 0 | 1.8 | 4.95 | 1.35 | 10.36 |
| Total | 22 | 19 | 1 | 79 | 94 | 7 | 222 |
| | 9.91 | 8.56 | 0.45 | 35.59 | 42.34 | 3.15 | 100 |

When sleep duration of 6-8 hours were compared (Table. 6), results showed that population aged 30-39 years(34.68%) were mostly affected with pre hypertension (14.41%) and Stage I Hypertension(2.7%) followed by 40-49 years (8.11% pre-hypertensive and 1.35% Stage I hypertensive). Population aged 60-69 years (6.31% pre-hypertension, 1.8 % Stage I hypertension and 3.15% stage II hypertension) were also amongst the mostly affected population with hypertension.

**Table7: Age Vs Sleeping Hours ( ≥8 hours) Vs Blood Pressure ( In Percentage)**

| AGE | Stage I | Stage II | Low | Normal | Pre-Hypertension | Systolic Hypertension | Total |
|---|---|---|---|---|---|---|---|
| 30 - 39 | 2.27 | 0 | 0 | 15.91 | 13.64 | 0 | 31.82 |
| 40 - 49 | 1.14 | 3.41 | 0 | 7.95 | 2.27 | 0 | 14.77 |
| 50 - 59 | 3.41 | 6.82 | 0 | 6.82 | 4.55 | 0 | 21.59 |
| 60 - 69 | 0 | 6.82 | 0 | 1.14 | 3.41 | 0 | 11.36 |
| 70 - 79 | 1.14 | 3.41 | 0 | 2.27 | 3.41 | 0 | 10.23 |
| 80 +++ | 1.14 | 2.27 | 0 | 4.55 | 1.14 | 1.14 | 10.23 |
| Total | 8 | 20 | 0 | 34 | 25 | 1 | 88 |
| | 9.09 | 22.73 | 0 | 38.64 | 28.41 | 1.14 | 100 |

On evaluating the population with ≥8 Hours sleep (Table.7) it showed that population aged 30-39 years (31.82%) were mostly affected with hypertension, followed by the age group of 50-59 years. Population aged 60-69 years were also amongst the mostly affected population with hypertension.

## DISCUSSION

This study provided up-to-date information about the levels of cardiovascular risk factors and the prevalence of hypertension in rural Karnataka. From a total of 650 rural population studied during the research only 584 satisfied the inclusion criteria and were enrolled in the study. When the literacy status of population was evaluated we found that most of the population was illiterate however, few studies have found that formal literacy status and health literacy are not strongly related [18]. It is a matter of general understanding that with the emerging literacy an individual can understand the written commands in a better way and the chances of non-compliance are less. Moreover, studies suggest the importance of patient education in the treatment and management of hypertension [19]. As it was evident from the study results that the maximum hypertensive population was with low literacy status (either illiterate or till primary education). The occupation distribution of study population showed that farmers were majorly affected, while the second most prevalent group were housewives both in respect of prevalence of hypertension and occupation as well. The probable reason may be the lack of awareness about the risk factors and mostly the lack of physical activity within the second group. The study concluded that most of the rural population were unaware about the health benefit of physical exercise. This fact was further supported with the results which showed that the individuals who were not practicing regular exercise were with more risk of Pre-hypertension, Stage I, Stage II and Systolic Hypertension. The data supports the importance of physical exercise in improving cardiovascular health as shown in many previous studies done on the effect of physical exercise on cardiovascular health [1,8-11,21]. Moreover, it is a well-known fact that oxidative stress increases with ageing therefore, moderate physical activity may generate mild oxidative stress that activates cellular stress response, which signals and potentiates cellular antioxidant defence capacity, whereas exhaustive exercise may cause accumulation of reactive oxygen species that can damage DNA, cause mutations, or promote carcinogenesis and the development of cardiovascular disorders including hypertension [20,22,25].

With stress thought to be a risk factor in the development and progression of cardiovascular ailments [18]. Our study utilized the number of sleeping hours as the probable risk factors to assess the stress and its effect on the cardiovascular health. Although, the ideal sleeping hours were well achieved as a good percentage of population were having sleep for an ideal 6-8 hours but still the same population was amongst the one which showed high prevalence of hypertension however, most of the normotensives had represented the same group. Further detailed analysis showed that individuals with sleeping hours ≤ 6 were affected the most, as individuals with advancing age had either developed or were on the risk of developing hypertension (suffering with pre-hypertension). This fact was further supported by the results of detailed analysis of individuals sleeping 6-8 hours a day which showed a similar trend of development of hypertension with advancing age. When the individuals in the group of sleeping hours ≥ 8hours were analysed the results obtained followed a similar pattern of development of hypertension with advancing age irrespective of number of sleeping hours per day.

Although, an individual factor can't be blamed responsible for the development and progression of hypertension in this rural area. Results suggested a collective role of all the studied factors viz. regular physical exercise, appropriate and proper health education, proper and quality sleep and the role of occupation of an individual as was an indicator of sedentary or physically active lifestyle.

## CONCLUSION

This study concluded with the association between the risk factors of hypertension, the results obtained showed that there is a direct relationship between physical exercise and hypertension, we found that the study population with sedentary lifestyle was more prone to hypertension; also, it was found that literacy status also plays an important role in understanding the risk factors associated with hypertension thereby may prove important in prevention of propagation of hypertension. However, the study failed to prove any direct relationship between sleeping hours and hypertension instead it was observed that advancing age further acts as a catalyst in the development and progression of hypertension. Patients should be encouraged to adopt brisk walking and energetic daily activities like household work; leisure time sports activities; in their daily program [7]. Literacy assessments can also be used to measure a patient's ability to understand instructions from a health care provider. In addition to poor communication, ethnic minority and low-income patients may have more difficulty accessing quality health information [1]. Health literacy is the degree to which individuals can obtain, process, and understand the basic health information and services they need to make appropriate health decisions [23]. Patients with low health literacy and chronic diseases have less knowledge of their disease and its treatment with minimal self-management skills than literate patients resulting in a 50% increased risk of hospitalization, compared with patients who had adequate literacy skills [24].

Further, through these kind of studies we can spread a mass awareness about cardiovascular diseases and the risk factors associated with them, which may further help in reducing the burden of these Non-communicable Diseases and help in improving the Quality of life.

## CONFLICT OF INTEREST

Conflict of interest declared none.

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