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***Research Article***

# INCIDENCE OF HYPERTENSION IN URBAN AND RURAL POPULATION

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## ABSTRACT
Hypertension is an important public health challenge in both economically developing and developed countries Measures are required at a population level to prevent the development of hypertension and to improve awareness, treatment and control of hypertension in the community. Recent studies among Indians have shown a high prevalence of hypertension in both urban and rural areas. The effects of B.M.I B.S.A. and W.H.R. on the S.B.P., D.B.P. and M.A.P. have been proved in the present study in both urban and rural populations in both sexes in the age group of 20 – 60 years. Increased incidence of silent hypertension in the urban males and females compared to rural males and females can be noticed from the present study.

***Keywords:*** *B.M.I B.S.A. and W.H.R. on the S.B.P., D.B.P. and M.A.P.*

## INTRODUCTION
Ancient sages knew historically high BP as a clinical problem. The practitioners of modern medicine in the mid twentieth century are also aware of its importance.
Dyer *et al.,* (1999) found the predictors of high normal blood pressure to be BMI, waist circumference (WC), physical activity, alcohol, pulse rate, smoking, education, fasting insulin, triglycerides, uric acid, HDL cholesterol as well as age and SBP.
Whelton *et al.,* (2002) recommended lifestyle modifications for primary prevention of hypertension which included maintenance of normal body weight for adults (BMI 18.5 – 24.9 Kg/M2), reduced dietary sodium intake to less than 6 gms/day, physical exercise (at least 30 minutes/day), limited alcohol consumption, adequate intake of dietary potassium more than 3.5 gms / day and consumption of a diet rich in fruits and vegetables and dairy products with a reduced content of saturated and total fat.
Folkow *et al.,* (1993) explained the effects of aging on the vascular system. Generalized age changes may interfere with the functioning of various vascular components to different degrees. Many of these functional changes that have been identified in the vascular system can be linked to altered structural, biochemical and molecular mechanisms.
Sokolow and Harris (1961) described the relationship of blood pressure to age. The decreased elasticity of the aorta and its distensibility with decreased baroreceptor response may account for transient rises in BP in older persons. Ziegler *et al.,* (1976) found a gradual increase in plasma levels of noradrenaline with age in resting subjects and greater increase to uniform stress. This is due to increased secretion of noradrenaline or decreased catabolism or reuptake of secreted nor adrenaline in older subjects. Pan *et al.,* (1986) reported that in modern industrialized societies aging is often associated with weight gain, which contributes to higher blood pressure in elderly, contradicted by findings in several preliterate societies where blood pressure does not increase with age.
Cohen and Flamenbaum (1986) found that changes in weight correlated with changes in BP, suggesting that larger weight losses are associated with larger BP reductions. They also commented that moderate reductions necessary to achieve significant BP decrements are easier to attain and maintain than the weight losses necessary to achieve ideal body weight. Baumgartner *et al.,* (1987) found a positive association of centripetal fat pattern indexed by WHR with SBP in men. Kaufman *et al.,* (1997) observed a threshold at 21 Kg/M2 in the relationship of BMI with BP for women but not for men, suggesting that there exists a relationship between the two even in the lean population.

Mertens and Vangaal (2000) showed an association between BMI and BP, and suggested that a modest weight reduction, defined as 5% to 10% of baseline weight can normalize BP without reaching the baseline. Doll et al Switzerland in 2002 found on average that SBP and DBP increased linearly over the whole variation range of BMI, WHR and weight gain of 1.7 Kg/M in BMI, of 4.5 cm in WCH or of 3.4% in WHR corresponded to an elevation of 1 mmHg in SBP.

## MATERIALS AND METHODS

Present study has been done in the Charminar Area of Hyderabad City and Jalpally Village which is about 250 Km from Hyderabad. The study involves 50 males and 50 females from the urban area and 50 males and 50 females from the rural area and included subjects based on the following criteria:

***Age:*** Adult subjects are included in the study and are divided into two groups, One of the groups included males in the age group of 20 – 60 years and the other group included females in the age group of 20 – 60 years. This was done in accordance with the joint National Committee Report VI guidelines[77]. 50 healthy males form the urban area and 50 healthy males from the rural area who had no significant ailments are selected. Similarly 50 healthy females from urban area and 50 healthy females from rural area who had no significant ailments are selected. Care was taken to choose the subjects who are not suffering from any major illness at present or in the recent past.

***Sex:*** The study includes both male and female adult subjects.

***Blood Pressure:*** The subjects are all normotensive individuals. Normal blood pressure is defined as systolic blood pressure less than 140mm Hg and diastolic blood pressure less than 90mm Hg as per the guidelines of JNC-VI.

A prior informed consent was obtained from each subject and was briefed about the procedure to achieve full co-operation. The Institutional ethics committee approval was obtained. Data on demographic characteristics, medical history, medication use and habits was obtained with the use of a standardized questionnaire administered by a trained technologist. Each subject's height and weight was recorded and the Body mass index was calculated.

### *Measurement of Blood Pressure*

Blood Pressure measurements are done in the morning hours between 8.00 and 10.00 a.m. The same mercury sphygmomanometer was used for all subjects and BP was measured using the auscultatory method (Littman stethoscope). The equipment was checked and calibrated for its accuracy as per the recommendations by British Hypertension Society.

Measurements are taken in the sitting position. Tight fitting clothing was removed. The cuff was applied firmly on the right arm, which was supported at the level of the heart. Readings are taken with precautions to avoid parallax error.

Measurements are taken on three occasions. Care was taken to give five minutes rest to the subject prior to first measurement. The second measurement was taken 15 minutes later. The third reading was taken after 30 minutes.

The average of the three readings was taken as the blood pressure of the individual. This protocol was followed as per previous studies on hypertension, which had shown that the average value of measurements done at different visits would take into account the BP variability of the subject (Dyer *et al.*, 1999). Both SBP and DBP are measured. The first appearance of the sound (Phase I) was used to define the SBP. The disappearance of the sound (Phase V) was used to define DBP.

### *Mean Arterial Pressure*

It is the weighted mean pressure of the blood. This was calculated as D.B.P.+ 1/3 Pulse Pressure .Pulse Pressure is S.B.P. – D.B.P.

### *Statistical Analysis*

The data obtained was analysed for comparison of the two groups, (Urban and Rural). The values are considered statically significant when the $P<0.05$ the results obtained are confirmed using multiple regression analysis, correlation coefficients are calculated using Pearson Correlation.

## RESULTS AND DISCUSSION

A total of 200 subjects were included in the study. All the subjects were adults between 20 – 60 years, normotensive males and females. There were 100 urban and 100 rural adults out of which male: female ratio was 50: 50.

**Table 1: Prevalence of hypertension**

| BP STATUS | RURAL | | | | URBAN | | | |
|---|---|---|---|---|---|---|---|---|
| | MALES | | FEMALES | | MALES | | FEMALES | |
| | COUNT | % | COUNT | % | COUNT | % | COUNT | % |
| HYPERTENSIVE | 5 | 10.0% | 5 | 10.0% | 15 | 30.0% | 7 | 14.0% |
| NORMOTENSIVE | 45 | 90.0% | 45 | 90.0% | 35 | 70.0% | 43 | 86.0% |

Table 1 shows the variation of B.P in rural and urban environment for both males and females. Though all the subjects are supposed to be normotensive by history, in the present study it is found that 10% of rural males and 10% of rural females are hypertensive and 30% of urban males and 14% of urban females are having diastolic pressures more than 90 mm which is evident from table-1.

**Table 2: Demographic profile and test parameters (of the subjects)**

| | Rural region | | | | Urban region | | | |
|---|---|---|---|---|---|---|---|---|
| | Male (n=50) | | Female (n=50) | | Male (n=50) | | Female (n=50) | |
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Age (in years) | 35 | 12 | 31 | 9 | 42 | 10 | 37 | 9 |
| Weight (in kgs) | 55 | 8 | 46 | 5 | 69 | 12 | 57 | 10 |
| Height (in cms) | 165.1 | 6.2 | 160.4 | 7.6 | 163.9 | 6.0 | 156.7 | 6.6 |
| Body mass index (in $kg/m^2$) | 20.22 | 2.95 | 17.88 | 2.14 | 25.88 | 4.71 | 23.33 | 4.09 |
| Body surface area (in $m^2$) | 1.60 | .11 | 1.47 | .07 | 1.74 | .15 | 1.57 | .12 |
| Waist-Hip ratio | .82 | .06 | .75 | .04 | .90 | .05 | .86 | .09 |
| Pulse rate (in beats/min) | 71 | 5 | 71 | 3 | 73 | 3 | 73 | 2 |
| Systolic BP (in mmHg) | 122 | 11 | 117 | 9 | 140 | 11 | 133 | 8 |
| Diastolic BP (in mmHg) | 77 | 6 | 75 | 7 | 91 | 9 | 87 | 7 |
| Pulse pressure (in mmHg) | 45 | 9 | 42 | 7 | 50 | 8 | 46 | 8 |
| Mean arterial BP (in mmHg) | 92.0 | 6.7 | 89.0 | 7.4 | 107.1 | 8.8 | 102.5 | 5.8 |

Table 2 shows the demographic profile and test parameters of all the subjects. As per this table the B.M.I and M.A.P. is significantly increased in the urban population compared to the rural population. The B.M.I is significantly related to the Diastolic Blood Pressure. There is a statistical significant difference compared between the rural and the urban population. There is a correlation between S.B.P. and B.M.I

and W.H.R. The S.B.P. is significantly increased in the urban population than the rural population Analysis of ANOVA was done to study the relationship of blood pressure with all other parameters.

**Table 3: Systolic blood pressure correlation**

**ANOVA**

**Systolic BP (in mmHg)**

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 16367.640 | 3 | 5455.880 | 58.296 | .000 |
| Within Groups | 18343.480 | 196 | 93.589 | | |
| Total | 34711.120 | 199 | | | |

**Multiple Comparisons**

**Dependent Variable: Systolic BP (in mmHg)**

| | (I) Region & Gender | (J) Region & Gender | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Tukey HSD | Rural-Male | Rural-Female | 4.420 | 1.935 | .105 | -.59 | 9.43 |
| | | Urban-Male | -18.380(*) | 1.935 | .000 | -23.39 | -13.37 |
| | | Urban-Female | -11.480(*) | 1.935 | .000 | -16.49 | -6.47 |
| | Rural-Female | Rural-Male | -4.420 | 1.935 | .105 | -9.43 | .59 |
| | | Urban-Male | -22.800(*) | 1.935 | .000 | -27.81 | -17.79 |
| | | Urban-Female | -15.900(*) | 1.935 | .000 | -20.91 | -10.89 |
| | Urban-Male | Rural-Male | 18.380(*) | 1.935 | .000 | 13.37 | 23.39 |
| | | Rural-Female | 22.800(*) | 1.935 | .000 | 17.79 | 27.81 |
| | | Urban-Female | 6.900(*) | 1.935 | .003 | 1.89 | 11.91 |
| | Urban-Female | Rural-Male | 11.480(*) | 1.935 | .000 | 6.47 | 16.49 |
| | | Rural-Female | 15.900(*) | 1.935 | .000 | 10.89 | 20.91 |
| | | Urban-Male | -6.900(*) | 1.935 | .003 | -11.91 | -1.89 |
| Tamhane | Rural-Male | Rural-Female | 4.420 | 1.997 | .163 | -.94 | 9.78 |
| | | Urban-Male | -18.380(*) | 2.136 | .000 | -24.11 | -12.65 |
| | | Urban-Female | -11.480(*) | 1.857 | .000 | -16.48 | -6.48 |
| | Rural-Female | Rural-Male | -4.420 | 1.997 | .163 | -9.78 | .94 |
| | | Urban-Male | -22.800(*) | 2.009 | .000 | -28.20 | -17.40 |
| | | Urban-Female | -15.900(*) | 1.711 | .000 | -20.50 | -11.30 |
| | Urban-Male | Rural-Male | 18.380(*) | 2.136 | .000 | 12.65 | 24.11 |
| | | Rural-Female | 22.800(*) | 2.009 | .000 | 17.40 | 28.20 |
| | | Urban-Female | 6.900(*) | 1.871 | .002 | 1.87 | 11.93 |
| | Urban-Female | Rural-Male | 11.480(*) | 1.857 | .000 | 6.48 | 16.48 |
| | | Rural-Female | 15.900(*) | 1.711 | .000 | 11.30 | 20.50 |
| | | Urban-Male | -6.900(*) | 1.871 | .002 | -11.93 | -1.87 |

**The mean difference is significant at the .05 level.*

Table 3 reflects the multiple comparisons, Systolic Blood Pressure in mm Hg. is the dependent variable in this table. Comparative study between the rural and urban males and females was done. The mean difference is significant at the 0.05 Level.

**Table 4: Diastolic blood pressure correlation**
**ANOVA**
**Diastolic BP (in mmHg)**

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 8662.240 | 3 | 2887.413 | 54.624 | .000 |
| Within Groups | 10360.480 | 196 | 52.860 | | |
| Total | 19022.720 | 199 | | | |

**Post Hoc Tests**
**Multiple Comparisons**
**Dependent Variable: Diastolic BP (in mmHg)**

| | (I) Region & Gender | (J) Region & Gender | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Tukey HSD | Rural-Male | Rural-Female | 2.280 | 1.454 | .399 | -1.49 | 6.05 |
| | | Urban-Male | -13.400(*) | 1.454 | .000 | -17.17 | -9.63 |
| | | Urban-Female | -10.000(*) | 1.454 | .000 | -13.77 | -6.23 |
| | Rural-Female | Rural-Male | -2.280 | 1.454 | .399 | -6.05 | 1.49 |
| | | Urban-Male | -15.680(*) | 1.454 | .000 | -19.45 | -11.91 |
| | | Urban-Female | -12.280(*) | 1.454 | .000 | -16.05 | -8.51 |
| | Urban-Male | Rural-Male | 13.400(*) | 1.454 | .000 | 9.63 | 17.17 |
| | | Rural-Female | 15.680(*) | 1.454 | .000 | 11.91 | 19.45 |
| | | Urban-Female | 3.400 | 1.454 | .093 | -.37 | 7.17 |
| | Urban-Female | Rural-Male | 10.000(*) | 1.454 | .000 | 6.23 | 13.77 |
| | | Rural-Female | 12.280(*) | 1.454 | .000 | 8.51 | 16.05 |
| | | Urban-Male | -3.400 | 1.454 | .093 | -7.17 | .37 |
| Tamhane | Rural-Male | Rural-Female | 2.280 | 1.328 | .430 | -1.29 | 5.85 |
| | | Urban-Male | -13.400(*) | 1.514 | .000 | -17.48 | -9.32 |
| | | Urban-Female | -10.000(*) | 1.260 | .000 | -13.38 | -6.62 |
| | Rural-Female | Rural-Male | -2.280 | 1.328 | .430 | -5.85 | 1.29 |
| | | Urban-Male | -15.680(*) | 1.625 | .000 | -20.05 | -11.31 |
| | | Urban-Female | -12.280(*) | 1.392 | .000 | -16.02 | -8.54 |
| | Urban-Male | Rural-Male | 13.400(*) | 1.514 | .000 | 9.32 | 17.48 |
| | | Rural-Female | 15.680(*) | 1.625 | .000 | 11.31 | 20.05 |
| | | Urban-Female | 3.400 | 1.570 | .182 | -.82 | 7.62 |
| | Urban-Female | Rural-Male | 10.000(*) | 1.260 | .000 | 6.62 | 13.38 |
| | | Rural-Female | 12.280(*) | 1.392 | .000 | 8.54 | 16.02 |
| | | Urban-Male | -3.400 | 1.570 | .182 | -7.62 | .82 |

**The mean difference is significant at the .05 level.*

Table 4 shows multiple comparisons are done. The dependent variable is the Diastolic Blood Pressure in mm Hg. Comparative study between the rural and urban males and females was done. The mean difference is significant at the 0.05 Level.

**Table 5: Pulse pressure correlation**
**ANOVA**
**Pulse pressure (in mmHg)**

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 1345.240 | 3 | 448.413 | 7.090 | .000 |
| Within Groups | 12396.760 | 196 | 63.249 | | |
| Total | 13742.000 | 199 | | | |

**Post Hoc Tests**
**Multiple Comparisons**
**Dependent Variable: Pulse pressure (in mmHg)**

| | (I) Region & Gender | (J) Region & Gender | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Tukey HSD | Rural-Male | Rural-Female | 2.140 | 1.591 | .535 | -1.98 | 6.26 |
| | | Urban-Male | -4.980(*) | 1.591 | .011 | -9.10 | -.86 |
| | | Urban-Female | -1.480 | 1.591 | .789 | -5.60 | 2.64 |
| | Rural-Female | Rural-Male | -2.140 | 1.591 | .535 | -6.26 | 1.98 |
| | | Urban-Male | -7.120(*) | 1.591 | .000 | -11.24 | -3.00 |
| | | Urban-Female | -3.620 | 1.591 | .107 | -7.74 | .50 |
| | Urban-Male | Rural-Male | 4.980(*) | 1.591 | .011 | .86 | 9.10 |
| | | Rural-Female | 7.120(*) | 1.591 | .000 | 3.00 | 11.24 |
| | | Urban-Female | 3.500 | 1.591 | .127 | -.62 | 7.62 |
| | Urban-Female | Rural-Male | 1.480 | 1.591 | .789 | -2.64 | 5.60 |
| | | Rural-Female | 3.620 | 1.591 | .107 | -.50 | 7.74 |
| | | Urban-Male | -3.500 | 1.591 | .127 | -7.62 | .62 |
| Tamhane | Rural-Male | Rural-Female | 2.140 | 1.543 | .670 | -2.01 | 6.29 |
| | | Urban-Male | -4.980(*) | 1.669 | .021 | -9.46 | -.50 |
| | | Urban-Female | -1.480 | 1.708 | .948 | -6.07 | 3.11 |
| | Rural-Female | Rural-Male | -2.140 | 1.543 | .670 | -6.29 | 2.01 |
| | | Urban-Male | -7.120(*) | 1.464 | .000 | -11.05 | -3.19 |
| | | Urban-Female | -3.620 | 1.508 | .105 | -7.67 | .43 |
| | Urban-Male | Rural-Male | 4.980(*) | 1.669 | .021 | .50 | 9.46 |
| | | Rural-Female | 7.120(*) | 1.464 | .000 | 3.19 | 11.05 |
| | | Urban-Female | 3.500 | 1.637 | .193 | -.90 | 7.90 |
| | Urban-Female | Rural-Male | 1.480 | 1.708 | .948 | -3.11 | 6.07 |
| | | Rural-Female | 3.620 | 1.508 | .105 | -.43 | 7.67 |
| | | Urban-Male | -3.500 | 1.637 | .193 | -7.90 | .90 |

**The mean difference is significant at the .05 level.*

Table 5 reflects multiple comparisons. Pulse Pressure in mm Hg. is the dependent variable. Comparative study between both the rural and urban males and females was done. The mean difference is significant at 0.05 Level.

**Table 6: Mean arterial pressure correlation**
**ANOVA**
**Mean arterial BP (in mmHg)**

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 10931.764 | 3 | 3643.921 | 69.566 | .000 |
| Within Groups | 10266.644 | 196 | 52.381 | | |
| Total | 21198.409 | 199 | | | |

**Post Hoc Tests**
**Multiple Comparisons**
**Dependent Variable: Mean arterial BP (in mmHg)**

| | (I) Region & Gender | (J) Region & Gender | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Tukey HSD | Rural-Male | Rural-Female | 2.9933 | 1.4475 | .167 | -.757 | 6.744 |
| | | Urban-Male | -15.0600(*) | 1.4475 | .000 | -18.811 | -11.309 |
| | | Urban-Female | -10.4933(*) | 1.4475 | .000 | -14.244 | -6.743 |
| | Rural-Female | Rural-Male | -2.9933 | 1.4475 | .167 | -6.744 | .757 |
| | | Urban-Male | -18.0533(*) | 1.4475 | .000 | -21.804 | -14.303 |
| | | Urban-Female | -13.4867(*) | 1.4475 | .000 | -17.237 | -9.736 |
| | Urban-Male | Rural-Male | 15.0600(*) | 1.4475 | .000 | 11.309 | 18.811 |
| | | Rural-Female | 18.0533(*) | 1.4475 | .000 | 14.303 | 21.804 |
| | | Urban-Female | 4.5667(*) | 1.4475 | .010 | .816 | 8.317 |
| | Urban-Female | Rural-Male | 10.4933(*) | 1.4475 | .000 | 6.743 | 14.244 |
| | | Rural-Female | 13.4867(*) | 1.4475 | .000 | 9.736 | 17.237 |
| | | Urban-Male | -4.5667(*) | 1.4475 | .010 | -8.317 | -.816 |
| Tamhane | Rural-Male | Rural-Female | 2.9933 | 1.4057 | .196 | -.782 | 6.769 |
| | | Urban-Male | -15.0600(*) | 1.5585 | .000 | -19.251 | -10.869 |
| | | Urban-Female | -10.4933(*) | 1.2489 | .000 | -13.848 | -7.138 |
| | Rural-Female | Rural-Male | -2.9933 | 1.4057 | .196 | -6.769 | .782 |
| | | Urban-Male | -18.0533(*) | 1.6219 | .000 | -22.411 | -13.695 |
| | | Urban-Female | -13.4867(*) | 1.3273 | .000 | -17.055 | -9.919 |
| | Urban-Male | Rural-Male | 15.0600(*) | 1.5585 | .000 | 10.869 | 19.251 |
| | | Rural-Female | 18.0533(*) | 1.6219 | .000 | 13.695 | 22.411 |
| | | Urban-Female | 4.5667(*) | 1.4881 | .017 | .558 | 8.575 |
| | Urban-Female | Rural-Male | 10.4933(*) | 1.2489 | .000 | 7.138 | 13.848 |
| | | Rural-Female | 13.4867(*) | 1.3273 | .000 | 9.919 | 17.055 |
| | | Urban-Male | -4.5667(*) | 1.4881 | .017 | -8.575 | -.558 |

*The mean difference is significant at .05 level*

Table 6 reflects multiple comparisons the Mean Arterial Blood Pressure in mm Hg. is the dependent variable. The mean difference is significant at the 0.05 Level.

**Table 7: M.A.P and B.M.I correlation**
***Correlations and descriptive statistics***

| | | | |
|---|---|---|---|
| Mean arterial BP (in mmHg) | 97.653 | 10.3211 | 200 |
| Body mass index (in kg/$m^2$) | 21.8283 | 4.70281 | 200 |

**Correlations**

| | | **Mean arterial BP (in mmHg)** | **Body mass index (in kg/$m^2$)** |
|---|---|---|---|
| Mean arterial BP (in mmHg) | Pearson Correlation | 1 | .657(**) |
| | Sig. (2-tailed) | | .000 |
| | Sum of Squares and Cross-products | 21198.409 | 6348.185 |
| | Covariance | 106.525 | 31.900 |
| | N | 200 | 200 |
| Body mass index (in kg/$m^2$) | Pearson Correlation | .657(**) | 1 |
| | Sig. (2-tailed) | .000 | |
| | Sum of Squares and Cross-products | 6348.185 | 4401.167 |
| | Covariance | 31.900 | 22.116 |
| | N | 200 | 200 |

***Correlation is significant at the 0.01 level (2-tailed).*

Table 7 shows there is an analysis of correlation between the M.A.P. in mm Hg and B.M.I in (Kg/$M^2$). The correlation is significant at the 0.01 Level (2-Tailed).

**Table 8: M.A.P and B.S.A correlation**
***Correlations***
***Descriptive Statistics***

| | **Mean** | **Std. Deviation** | **N** |
|---|---|---|---|
| Mean arterial BP (in mmHg) | 97.653 | 10.3211 | 200 |
| Body surface area (in $m^2$) | 1.5952 | .15114 | 200 |

**Correlations**

| | | Mean arterial BP (in mmHg) | Body surface area (in $m^2$) |
|---|---|---|---|
| Mean arterial BP (in mmHg) | Pearson Correlation | 1 | .570(**) |
| | Sig. (2-tailed) | | .000 |
| | Sum of Squares and Cross-products | 21198.409 | 177.000 |
| | Covariance | 106.525 | .889 |
| | N | 200 | 200 |
| Body surface area (in $m^2$) | Pearson Correlation | .570(**) | 1 |
| | Sig. (2-tailed) | .000 | |
| | Sum of Squares and Cross-products | 177.000 | 4.546 |
| | Covariance | .889 | .023 |
| | N | 200 | 200 |

***Correlation is significant at the 0.01 level (2-tailed).*

Table 8 shows the correlation between M.A.P. in mm Hg. And B.S.A. in $M^2$. There is a statistical significant correlation at the 0.01 Level (2-Tailed).

The effects of B.M.I B.S.A. and W.H.R. on the S.B.P., D.B.P. and M.A.P. have been proved in this study in both urban and rural populations in both sexes in the age group of 20 – 60 years. The effect of some anthropometric factors on blood pressure and parameters was studied, analysed and interpreted with reference to various similar Indian and Western Studies.

The following conclusions are drawn from the present study.

1. The B.M.I was found to be the most statistically significant parameter that affects the D.B.P. S.B.P. and M.A.P. in urban and rural population.
2. The urban population has significantly higher S.B.P. D.B.P. and M.A.P. than the rural population.
3. There is a correlation between W.H.R. and the blood pressure in the urban population.
4. There is increased incidence of silent hypertension in the urban males and females compared to rural males and females. This shows the effect of lifestyle and diet on the blood pressure of individuals.
5. The urban people have a better socioeconomic status compared to the rural people, which are also responsible for their affluent lifestyle, less exercise, sedentary habits, and adaptation of western food habits which is responsible for increased prevalence of hypertension in the urban population compared to the rural population.

Hypertension is an important public health challenge in both economically developing and developed countries significant numbers of Individuals with hypertension are unaware of this condition and, among those diagnosed with hypertension treatment is frequently inadequate. Measures are required at a population level to prevent the development of hypertension and to improve awareness, treatment and control of hypertension in the community.

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