**Table 1 Study Participants and Their Characteristics.**

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| --- | --- | --- | --- |
| **S. N** | **(Weighted n = 136,235, Unweighted n = 13,540)** | **Total (n)** | **Percent (%)** |
|  | Gender | | |
| 1 | Male | 43,371 | 31.8 |
| 2 | Female | 92,864 | 68.2 |
|  | Age Category | | |
| 1 | 16-39 | 82,186 | 60.3 |
| 2 | 40-59 | 36,702 | 26.9 |
| 3 | 60+ | 17,347 | 12.7 |
|  | Marital Status | | |
| 1 | divorced/separated/widowed | 9,338 | 6.9 |
| 2 | Married | 99,732 | 73.2 |
| 3 | Unmarried | 27,166 | 19.9 |
|  | Education Category | | |
| 1 | Basic Education (1-8) | 42,722 | 31.4 |
| 2 | No education | 40,070 | 29.4 |
| 3 | Secondary or Higher (9+) | 53,443 | 39.2 |
|  | Wealth Categories of Participants | | |
| 1 | Middle | 26737 | 19.6 |
| 2 | Poor | 52345 | 38.4 |
| 3 | Rich | 57154 | 42 |
|  | Ecological Belt of Residence | | |
| 1 | Mountain | 7462 | 5.5 |
| 2 | Hill | 55462 | 40.7 |
| 3 | Terai | 73312 | 53.8 |
|  | Zone of Residence | | |
| 1 | Urban | 91736 | 67.3 |
| 2 | Rural | 44500 | 32.7 |
|  | Blood Pressure Category | | |
| 1 | Elevated | 5,580 | 5.5 |
| 2 | Hypertensive | 38,915 | 38.5 |
| 3 | Normal | 56,479 | 55.9 |
|  | **BMI Category** | | |
| 1 | underweight | 18,982 | 14 |
| 2 | Normal | 59,166 | 43.5 |
| 3 | Overweight/Obese | 57,763 | 42.5 |
|  | **Categories** | **Total** | **Mean (SD)** |
| 1 | Age | 13,540 | 37.9 (16.59) |
| 2 | Systolic BP / mmhg | 10,022 | 116.83 (19.63) |
| 3 | Diastolic BP / mmhg | 10,022 | 75.96 (11.52) |
| 4 | BMI/Kg/m2 | 13,508 | 22.82 (4.24) |
| 5 | Height/ mtr | 13,510 | 1.55 (0.08) |
| 6 | Weight/Kg | 13,523 | 55.03 (11.58) |

The first model with BMI categories and predictors. Females in our analysis showed 13% higher odds of being in a higher BMI category compared to men (OR=1.13, 95% CI: 1.03-1.22, p=0.007). Age demonstrated a notable non-linear relationship, with middle-aged adults (40-59 years) having 73% higher odds of being in a higher BMI category compared to younger adults (OR=1.73 CI: 1.55-1.93, p<0.001), while those aged 60+ showed 19% lower odds (OR=0.81, 95% CI: 0.69-0.94, p=0.008). Marital status emerged as a strong predictor, with married individuals having over four times the odds (OR=4.14, 95% CI: 3.71-4.62, p<0.001) and divorced/separated/widowed individuals having over three times the odds (OR=3.46, 95% CI: 2.77-4.26, p<0.001) of having higher BMI compared to unmarried individuals. Education showed a positive relationship with secondary or higher education associated with 60% higher odds compared to no education (OR=1.60, 95% CI: 1.40-1.82, p<0.001) and basic education showed 43% higher odds of having higher BMI (OR=1.43, 95% CI: 1.28-1.6, p<0.001) than the reference group. Wealth demonstrated a strong positive association, with rich individuals having more than three times the odds compared to poor individuals (OR=3.16, 95% CI: 2.77-3.60, p<0.001). Rural residents showed 15% lower odds compared to urban residents (OR=0.85, 95% CI: 0.76-0.96, p=0.007). Geographically, those living in Hill regions had nearly twice the odds compared to Terai residents (OR=1.99, 95% CI: 1.77-2.25, p<0.001), with Mountain regions also showing similarly elevated odds (OR=1.73, 95% CI: 1.38-2.18, p<0.001).

**Table 2 BMI model results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **OR** | **2.50%** | **97.50%** | **p-value** |
| **Gender** | | | | |
| Male | 1.00 (reference) | | | |
| **Female** | 1.13 | 1.03 | 1.22 | 0.007 |
| Age Group | | | | |
| 16-39 | 1.00 (reference) | | | |
| 40-59 | 1.73 | 1.55 | 1.93 | 0 |
| 60+ | 0.81 | 0.69 | 0.94 | 0.008 |
| **Marital Status** | | | | |
| Unmarried | 1.00 (reference) | | | |
| Married | 4.14 | 3.71 | 4.62 | 0 |
| Divorced/Separated/Widowed | 3.46 | 2.77 | 4.26 | 0 |
| **Education** | | | | |
| No education | 1.00 (reference) | | | |
| Basic Education (1 - 8) | 1.43 | 1.28 | 1.6 | 0 |
| Secondary or Higher ( 9 and above) | 1.6 | 1.4 | 1.82 | 0 |
| **Wealth Category** | | | | |
| Poor | 1.00 (reference) | | | |
| Middle | 1.68 | 1.48 | 1.9 | 0 |
| Rich | 3.16 | 2.77 | 3.6 | 0 |
| **Residency Region** | | | | |
| Urban | 1.00 (reference) | | | |
| Rural | 0.85 | 0.76 | 0.96 | 0.007 |
| **Ecological Region** | | | | |
| Terai | 1.00 (reference) | | | |
| Mountain | 1.73 | 1.38 | 2.18 | 0 |
| Hill | 1.99 | 1.77 | 2.25 | 0 |
| 1|2 | 1.45 | 1.22 | 1.72 | 0 |
| 2|3 | 16.78 | 13.87 | 20.09 | 0 |

**Table 3 Blood Pressure Model Result**

The analysis shows blood pressure categories and its associations between various predictors of our dataset. In our study Men demonstrated 57% higher odds of being in a higher blood pressure category compared to women (OR=1.57, 95% CI: 1.42-1.73, p<0.001). Age showed a strong positive association, with middle-aged adults (40-59 years) having more than twice the odds (OR=2.27, 95% CI: 1.99-2.59, p<0.001) and those aged 60+ having nearly triple the odds (OR=2.92, 95% CI: 2.44-3.46, p<0.001) compared to younger adults. Married individuals had 40% higher odds (OR=1.40, 95% CI: 1.20-1.67, p<0.001) and divorced/separated/widowed individuals had double the odds (OR=2.03, 95% CI: 1.57-2.66, p<0.001) of being in a higher blood pressure categories compared to unmarried individuals. Education showed an inverse relationship, with higher education levels associated with lower odds of elevated blood pressure, secondary or higher education had 17% lower odds compared to those with no education (OR=0.83, 95% CI: 0.70-0.97, p=0.023). Wealth categories showed no significant association with blood pressure levels (p>0.05). Rural residents showed marginally lower odds compared to urban residents (OR=0.87, 95% CI: 0.75-1.00, p=0.05). Notably, ecological regions (Mountain and Hill) showed no significant differences in blood pressure categories compared to the Terai region (p>0.05).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **OR** | **2.50%** | **97.50%** | **p-value** |
| **Gender** | | | | |
| Female | 1.00 (reference) | | | |
| Male | 1.57 | 1.42 | 1.73 | 0 |
| Age Group | | | | |
| 16-39 | 1.00 (reference) | | | |
| 40-59 | 2.27 | 1.99 | 2.59 | 0 |
| 60+ | 2.92 | 2.44 | 3.46 | 0 |
| **Marital Status** | | | | |
| Unmarried | 1.00 (reference) | | | |
| Married | 1.4 | 1.2 | 1.67 | 0 |
| Divorced/Separated/Widowed | 2.03 | 1.57 | 2.66 | 0 |
| **Education** | | | | |
| No education | 1.00 (reference) | | | |
| Basic Education (1 - 8) | 0.88 | 0.77 | 1 | 0.045 |
| Secondary or Higher ( 9 and above) | 0.83 | 0.7 | 0.97 | 0.023 |
| **Wealth Category** | | | | |
| Poor | 1.00 (reference) | | | |
| Middle | 0.89 | 0.76 | 1.04 | 0.129 |
| Rich | 0.97 | 0.83 | 1.14 | 0.741 |
| **Residency Region** | | | | |
| Urban | 1.00 (reference) | | | |
| Rural | 0.87 | 0.75 | 1 | 0.05 |
| **Ecological Region** | | | | |
| Terai | 1.00 (reference) | | | |
| Mountain | 1.01 | 0.71 | 1.42 | 0.977 |
| Hill | 1.02 | 0.88 | 1.2 | 0.758 |
| 1|2 | 5.31 | 4.18 | 6.75 | 0 |
| 2|3 | 6.89 | 5.42 | 8.85 | 0 |