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## Suicide in Koppa During 2008-2017: A Register Based Study

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**Abstract:** : World Health Organization noted an alarming situation after increasing number and tendency of suicide or self-annihilation. Increasing incidences of suicides in Karnataka command researches based on regional variation and local factors. Koppa, a taluka place notes varying incidences of suicides in year-wise distribution. The male-female ratio of suicide in Koppa is almost near to global ratio. Hanging is noted as main mode of suicide followed by poisoning, drowning and burn. Thimet is found to be main source of poison for the people of this region as thimet is frequently used insecticide in agricultural practices in Koppa. The study marked more suicides in younger people. Cultural boundation is main factor to observe less elderly people in list of suicide.

**Keywords:** Suicide, Medico-legal cases, Koppa, Chikmagalur, Karnataka, Hanging, Poisoning, Drowning, Burn, Age-groups, Male-female ratio.....

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A famous written quote of Herodotus that ‘when life is so burdensome, death has become for man a sought-after refuge’. 3<sup>rd</sup> verse of *Isha Upanishada* highlights, ‘those people who are devoid of self-knowledge if commit suicide, they are locked in dark place of demons’. Means with knowledge and without anger, it was allowed? Philosophically suicide may or may not be right but legally it is not allowed. Legally suicide is an act or instance of taking one’s own life voluntarily or intentionally<sup>1</sup>. National Crime Records Bureau (NCRB) mentions suicide as a personal tragedy turning to premature death of individual and affecting the lives of many people of family<sup>8</sup>.

World Health Organization (WHO) reports around 800,000 deaths per year being second leading cause of death among 15-29 years old. Low and middle income countries share the 78% of global suicides. Most common global methods are said to be ingestion of pesticides, hanging and firearms<sup>2</sup>. Radhakrishnan and Andrade (2012) revealed the highest suicide by consumption of poison in India being 33.6%, followed by hanging (31.5%) and self-immolation (9.2%)<sup>11</sup>. Consumption of agricultural pesticides is commonest mean of suicide in rural India as these pesticides are easily available in agricultural based economy<sup>11</sup>.

Out of 17.9 suicides per 100,000 reported in 2015 for India, Karnataka stands on 6<sup>th</sup> position<sup>3,4</sup>. Among the various causes of suicide cognized by NCRB, professional problems, discrimination, sense of isolation, abuse, violence, family problems, bankruptcy, in debt burden etc. are common. Debt burdens are common cause of suicide in rural areas of nation where dependencies for livelihood is still more relying upon the agricultural practices as over 3,000 farmers who committed suicides across the country in 2015 due to debt, 2,474 had taken loans from banks or microfinance institutions<sup>9</sup>. According to Union Agriculture Minister, farmer’s suicides rose by 32% in Karnataka in 2016 as 2,079 suicides were recorded in 2016 against 1,569 in 2015<sup>10</sup>. *Deccan Herald* reported 186 suicides of farmers in Chikmagalur in January 11 edition of 2011 which is 3<sup>rd</sup> maximum followed by Hassan and Belgaum. Chikmagalur district has 7 talukas under two sub-divisions. Koppa is one taluka under Chikmagalur sub-division.

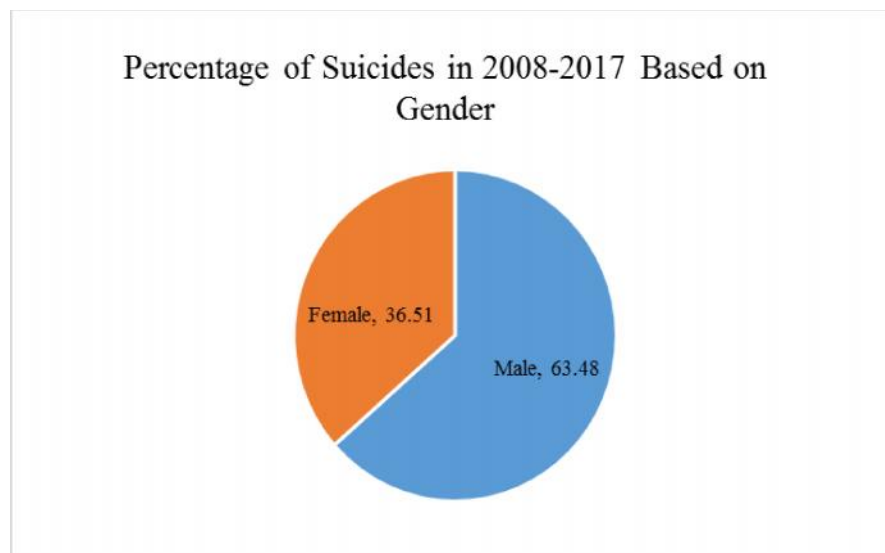
Koppa is situated at 763 meter above sea level<sup>6</sup>. It is hardly 40 km distant from Agumbe, one of five wettest place of India<sup>5</sup>. Population of Koppa taluka as per the 2011 census is 84,882 constituting 49.2% males and 50.8% females. Only 5.9% people live in urban area. The literacy rate is 83.28%. Agriculture is main income of source for people. Coffee, Tea, Areca, Pepper, Rice etc. are main crops. Koppa taluka is having 1 taluka general hospital and 9 primary healthcare centers (PHCs)<sup>7</sup>. Few private hospitals are present in Koppa, but these hospitals do not entertain cases related with suicide or attempt of suicide. Even PHCs refer such cases to taluka general hospital. Taluka general hospital is center for all critical and medico-legal cases specifically for suicide or suicidal attempts. Hence, cases of suicide or suicidal attempts reported in this hospital gives broader idea about the same for Koppa taluka.

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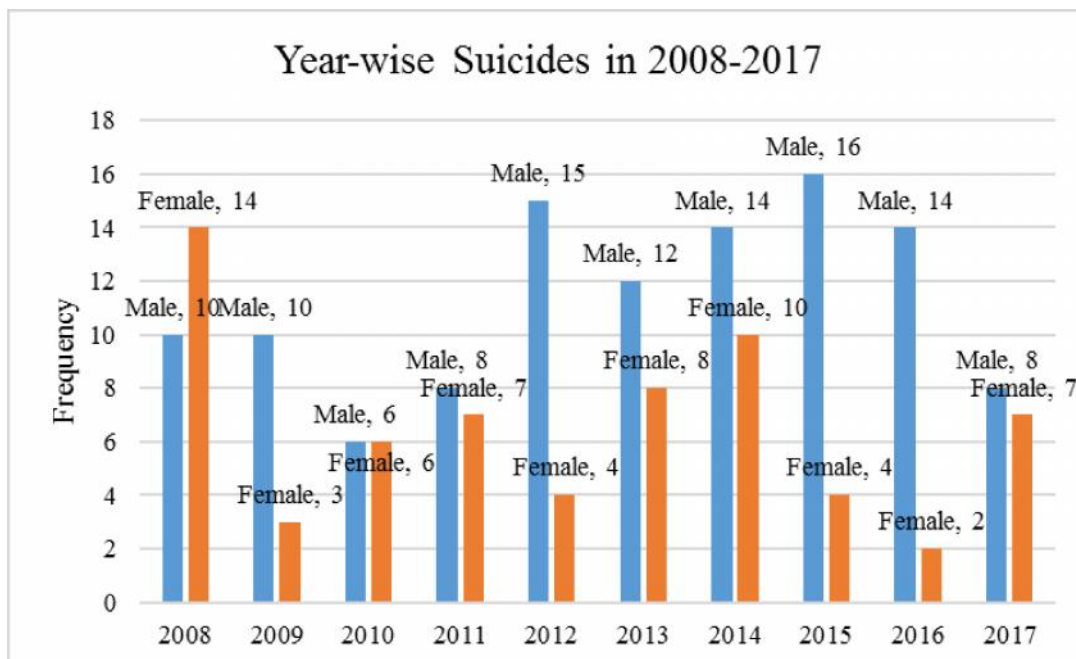
**Materials and Methods:** Study was conducted to estimate the frequency and mode of suicidal death in Koppa. Data was collected from registered suicidal deaths in Koppa general hospitals and register depicting medico-legal cases. Both data were merged. Data related to suicidal attempts and referred cases to other hospitals were excluded. Screening of registers with suicidal death from 2008 to 2017 was done. Data based on socio-demographic factors viz., age and sex were collected. The whole population was divided in four age-groups constituting 15-29, 30-44, 45-59 and 60 & above. Registered deaths due to suicides of below 15 years old were included in age-group of 15-29 as only few cases were reported. Mode of suicide was studied with respect to age groups.

**Observation:** Total 178 suicides were recorded during 2008 to 2017. 113 males and 65 females died due to suicide (Chart number-1). The year-wise distribution of male and female death differed from year to year (Chart number- 2).

**Chart number: 1**



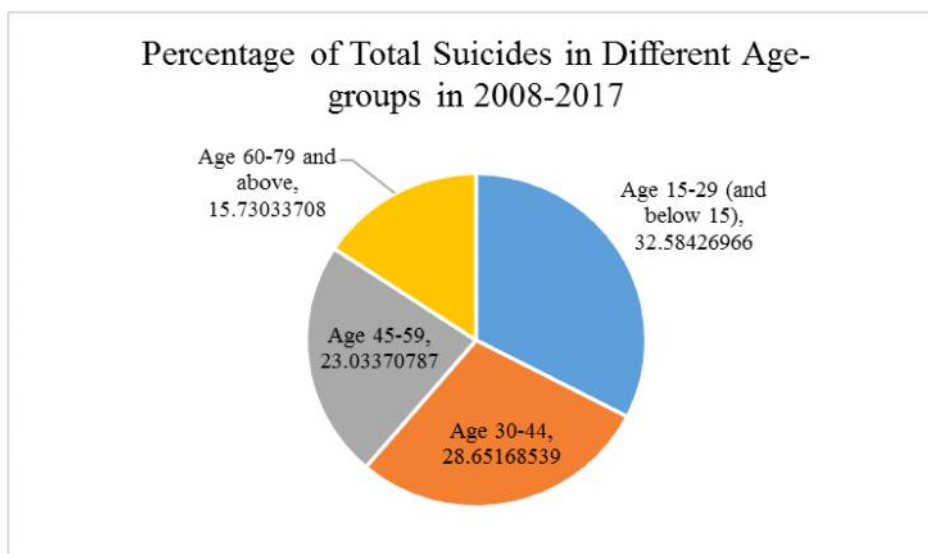
**Chart number: 2**



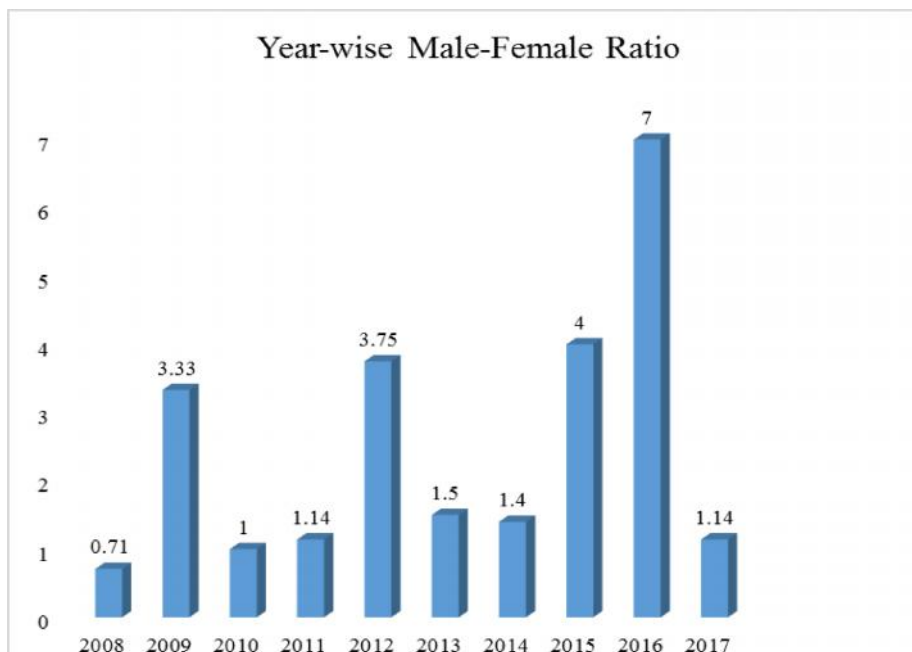
The percentage of suicides in taken age-groups viz., 15-29 (including below 15), 30-44, 45-59 and 60 & above were noted (Chart number-3). Year-wise male-female ratio of suicide was also calculated from collected data (Chart number-4). Percentage of mode of suicides was noted (Chart number- 5). Death due to different mode of

suicides in different age-groups varied (Chart number- 6).

**Chart number: 3**



**Chart number: 4**



**Chart number: 5**

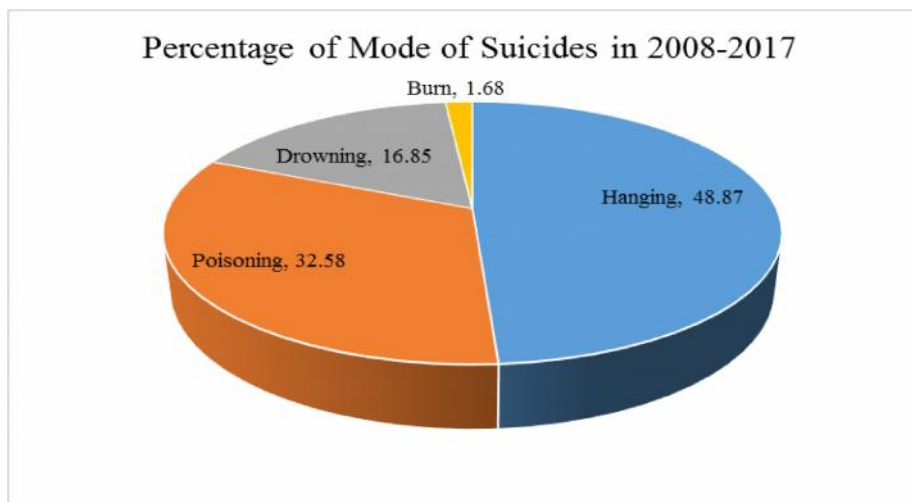
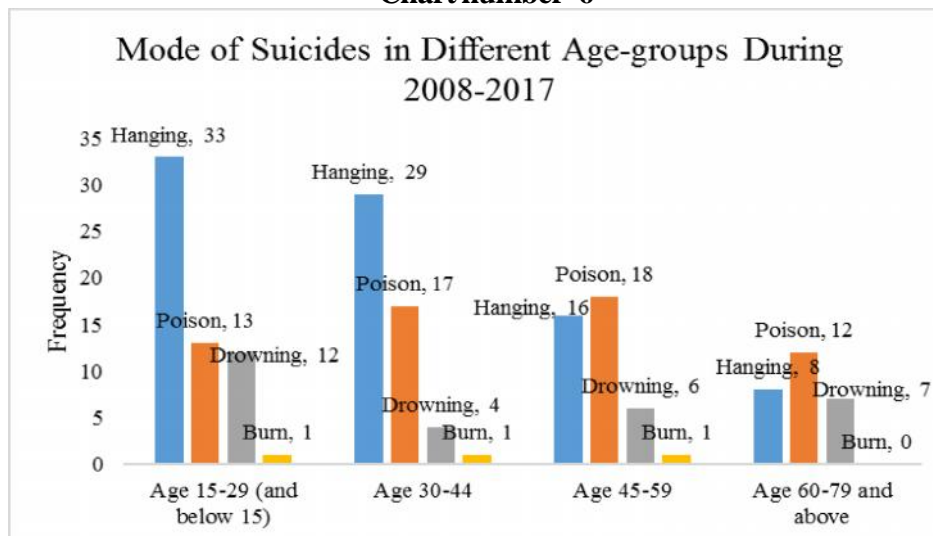


Chart number- 6



**Discussion:** 63.48% males and 36.52% females committed suicides in Koppa, the overall male-female ratio was noted 1.74. The global male-female ratio in 2015 was observed as 1.7<sup>12</sup>. Masculinity and femininity are associated with more deaths in male after suicide as survival rate of female after attempting suicide is comparatively more<sup>13</sup>.

In different age-groups as 15-29 (below 15 included), 30-44, 45-59 and 60 & above, the percentage of suicide was noted respectively as 33.15%, 28.65%, 23.03% and 15.17%. Not attending school/college, failures in performance, independent decision making, attraction towards opposite sex or premarital affairs, physical and sexual abuse, violence, psychological distresses etc. are common problems associated with age-group of 15-29<sup>11</sup>. High neuroticism and low extraversion are predictive of depressive symptoms and hopelessness which lead to suicidal tendency in this age-group<sup>14</sup>. Employment, responsibilities towards family, socioeconomic reasons as raising the family and achievements, lack of job opportunities, privatization leading to job insecurity, failures in agricultural practices, debt burdens, extramarital affairs etc. common factors for suicide in age-group of 29-44<sup>11,15</sup>. Many of these factors are common in age-group of 45-59 also. Still relationship difficulties are more frequently observed as important factor in this age-group<sup>16</sup>. Loss of importance of joint family leading to less care of elderly people, mental health, poorer recovery from suicidal attempts, property-related matters are main reasons for suicide among age-group of 60 and above<sup>11,14,15,16</sup>.

Only four mode of suicides are considered in present studies. Suicidal attempts by self-injuries are excluded as medico-legal evidences was not quite supportive for indicative of suicide. Among all these mode of suicides, hanging caused 48.87% of total deaths followed by poisoning leading to 32.58% deaths, 16.85% by drowning and 1.68% by burn. Hanging is well known and easiest method in which subject uses ligature with other end secured to fixture. Broken neck, venous obstruction leading to cerebral stagnation, hypoxia, unconsciousness, loss of muscle tone, artery or airway obstruction, arterial spasm due to carotid pressure leading to low cerebral blood flow, vagal collapse caused by carotid sinuses and increased parasympathetic tone etc. are normal pathophysiological reasons to death. Usually chances of saving the life is minimal in these cases<sup>17</sup>. Attempt of hanging doesn't need planning or technical knowledge. Easy accessibilities, anticipation of rapid, sure and painless death are main cause of hanging being the first preference of suicide in this region.

Suicide by poisoning is observed as second common leading mode of suicide in Koppa. Except one case of copper sulphate poisoning, all observed cases were due to thimet poisoning. Being an agricultural based economy thimet is easily available in this region. Thimet is tradename for the phorate, an insecticide and acaricide and its chemical name is O, O-Diethyl S-[(ethylsulfanyl) methyl] phosphorodithioate. It is common organophosphate used in Koppa. It inhibits acetylcholinesterase and butyrylcholinesterase (pseudocholinesterase) in mammals including human<sup>18</sup>. Inhibition of these enzymes causes over stimulation of nicotinic and muscarinic acetylcholine receptors slowing down

neurotransmission leading to muscle weakness, agitation, sweating, hypersalivation, respiratory failure, confusion, convulsion and death<sup>19</sup>. Another poison used in one case is Copper sulphate, which is frequently used in Areca farms. It is responsible for inactivation of glucose-6-phosphate dehydrogenase and glutathione reductase. Gastrointestinal bleeding, hypotension, tachycardia, hypoxia, methemoglobinemia, hepatic encephalopathy, renal failure, comma, seizure etc. leading to death is reported in acute poisoning of copper sulphate<sup>20</sup>.

Koppa taluka is having heavy rainfall with number of water sources viz., Tunga river, falls and many other water channels. So, to find a place for drowning is not big task in this region. Still rate of such attempt is only 16.85% of total cases due to pain and chances of saving. Asphyxia obstructing air-passage, anoxia of myocardium and respiratory center, arrhythmias, laryngeal spasm, vagal inhibition, exhaustion, fracture of skull etc. are common pathophysiological factors leading to death<sup>21</sup>. Only 3 suicidal deaths are reported by burning. Breathing of carbon monoxide or other toxic products of heat, inhalation of hot air or gases, vagal-mediated cardiac arrest etc. are common causes leading to death.

**Strength and limitations:** The present study is based on registered cases of MSDM Koppa general hospital and medico-legal cases. The study allows to investigate the details of deaths in reference to demographic details and pathophysiology assurance by post-mortem register. Options of any biasedness is avoided.

The one of important limitation of the present work is non-inclusion of any death under suicide without confirmation of post-mortem and approval from any of family member or police. Chances of suicides are always with many undetected or unreported deaths. The association of suicide with mental disorders or psychological problems could not be ascertained as subjects were only brought to hospital after suicidal attempts or death.

It can be concluded that further detailed cohort study or case-control or cross-sectional study would give better chances to understand the reasons of suicide in this region in details. Psychological distresses can be avoided by counselling, screening and availing the basic needs. Better system is always need of time for healthy society both by mental and physical health.

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