
**“STUDY OF ERECTILE DYSFUNCTION IN A DIABETIC
POPULATION - A ONE YEAR CROSS SECTIONAL STUDY AT
KLE'S PRABHAKAR KORE HOSPITAL”**

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LIST OF ABBREVIATIONS

Glossary	Abbreviations
AGEs	advanced glycation end-products
AOR	Adjusted Odds Ratio
cGMP	cyclic guanosine monophosphate
CHD	coronary heart disease
CKD	chronic Kidney Disease
DM	diabetes mellitus
DPN	Diabetic peripheral neuropathy
ED	Erectile dysfunction
EDITS	Erection Dysfunction Inventory of Treatment Satisfaction
eNOS	endothelial nitric oxide synthase
ETB	endothelin B
IIEF	International Index of Erectile Function
IIEF-EF	Erectile Function Domain of the IIEF
LEAs	lead to nondramatic lower-extremity amputations
LOCF	last observation carried forward
LS	least squares
mSLQQ-QoL	modified Sexual Life Quality Questionnaire-Quality of Life
nNOS	neuronal nitric oxide synthase
PAIRS	Psychological and Interpersonal Relationship Scales
PVD	Peripheral arterial disease
QEQ	Quality of Erection Questionnaire
ROS	reactive oxygen species
SDS	Self-Rating Depression Scale
SEAR	Self-Esteem and Relationship Questionnaire
SEQ	Sexual Experiences Questionnaire
SEX-Q	Sexual Experience Questionnaire
SHIM	Sexual Health Inventory for Men
T2DM	type 2 diabetes mellitus
TSS	Treatment Satisfaction Scale
WHO-5	World Health Organization-5

ABSTARCT

BACKGROUND:

Diabetes mellitus is a major public health problem in India. Erectile dysfunction is reported to be highly prevalent but neglected disease among diabetic population.

OBJECTIVES:

To assess the prevalence and factors associated with erectile dysfunction (ED) among the diabetic population.

MATERIALS AND METHODS:

The current study was a cross sectional study of 509 Type 2 diabetes mellitus patients, conducted in the department of general medicine of a tertiary care teaching hospital from January 2016 to January 2017. ED was assessed by International Index of Erectile Function (IIEF-5) Questionnaire.

RESULTS:

The prevalence of ED was 59.3%. The severity was mild and mild-moderate in 27.31% and 19.25% respectively, moderate in 5.3% and severe in 13.16% of the population. After adjusting for all potential confounders, the odds of ED were 3.61 times (95% CI 1.91 to 6.80, P Value < 0.001) more in 41 to 50 year age group as compared to below 40 year age group. It was 9.57 (95% CI 5.12 to 17.90, p value <0.001) times and 7.06 (95% CI 3.29 to 17.53, P value < 0.001) times more in 51 to 60 and above 60 age groups respectively. After adjusting for all potential confounders, the odds of ED were 3.63 times (95% CI 0.850 to 15.52, P value <0.001) in poor glycemic control and 5.65 (95% CI 1.46 to 21.84, p value 0.012) in people with very poor glycemic control groups as compared to people with good glycemic control. None of the other factors had any independent association with ED.

CONCLUSIONS:

Erectile dysfunction is highly prevalent and under diagnosed in diabetic population.

Higher age of the person and poor glycaemic control are strongly associated with ED.

Active screening of all the diabetic population with appropriate tools and effective management of the condition is needed.

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INTRODUCTION

Erectile dysfunction (ED) defined as the inability to achieve and maintain an erection sufficient to permit satisfactory sexual intercourse and is documented to be a major problem especially among diabetic patients².

There are numerous causes of ED generally falling into two categories, organic or psychogenic. The organic causes can be subdivided into five categories: vascular, traumatic/post-surgical, neurological, endocrine-induced, and drug-induced. Reported psychogenic causes include depression, performance anxiety, and relationship problems³.

A variety of chronic illnesses such as diabetes mellitus (DM), cardiovascular disease and depression are associated with higher rates of ED and among them DM appears to be a major determinant. In a study that was done in Massachusetts, United States of America it showed that diabetic men are 3 times as likely to develop ED as non-diabetic men. Also increase in the duration of diagnosed diabetes mellitus was shown to increase both the prevalence rate and severity of ED⁴. ED can occur early in the course of the disease and it can occasionally be the presenting symptom⁵. Some documented reports gave out the main risk factors of ED in people with diabetes as neuropathy, vascular insufficiency, poor glycemic control, hypertension, low testosterone levels, and lifestyle factors such as smoking, alcohol, and inactivity. In addition, the prevalence of ED greatly increases with age⁶.

A wide range of prevalence rates of ED among diabetic men has been reported in various studies. These studies⁴ suggest that its prevalence in men with diabetes ranges from 35–90% versus 26% in general population. Variation in prevalence is

mainly due to differences in definitions used, differences in the populations studied, study design, classification, and the diagnostic tools especially for studies conducted in the past.⁷ Sexual function is an important index of quality of life. The presence of ED has been negatively associated with men's social interactions, emotional and psychological well-being, and partner relationships'. It is important to note that ED is one of the most treatable complications of diabetes; the literature demonstrated that over 95% of cases can be successfully treated⁵.

Further complicating the issue is the sensitivity of the disorder. Erectile dysfunction is an issue that requires privacy; many men feel embarrassed to disclose and discuss the problem with their doctor, or even their life partner. In countries like India, open discussions about sexual matters occur infrequently, making the issue of privacy even more important. There is currently a gap in the literature, as very few studies of ED have previously been conducted in India.

AIMS AND OBJECTIVES

Objectives:

1. To assess the prevalence of Erectile dysfunction in sexually active males with Type 2 diabetes mellitus
2. To analyze various factors associated with Erectile Dysfunction among the study population.

REVIEW OF LITERATURE

GLOBAL BURDEN OF DIABETES MELLITUS:

Diabetes mellitus has emerged as a major public health problem affecting almost all nations across the globe.⁸ As per the recent estimates, the global diabetes prevalence in adults aged 20-79 years was estimated at 8.8% (interval: 7.2-11.3%). Once perceived primarily as a disease of affluent nations, as per the current trends, 3 out of 4 people with diabetes are estimated to be living in low- and middle-income countries.⁹ In 2015, it was estimated that there were 5.0 million deaths attributable to diabetes in people aged 20 to 79 years. Diabetes accounted for 12.8% of global all-cause mortality among people aged 20 to 79. Over 4 million diabetes-attributable deaths in people aged 20 to 79 occurred in low- and middle-income countries.¹⁰

BURDEN OF DIABETES IN INDIA:

India ranks second after China in the global diabetes epidemic and is experiencing a shift in diabetes prevalence from urban to rural areas, the affluent to the less privileged and older to younger people. The burden of diabetes in India has been increasing in leaps and bounds in both urban and rural areas. Type 2 diabetes is the most prevalent type of diabetes and in India, it is the most important driver of the diabetes epidemic.

The prevalence of diabetes in India according to the IDF Diabetes Atlas 2015, based on epidemiological studies conducted in India, is reported to be 8.7%, although there are large variations across geographic areas and socioeconomic groups. The number of people with diabetes has risen from 32.7 million in the year 2006 to

35.5million in 2003,⁷ 40.9 million in 2007,⁸ 50.8 million in 2010,⁹ 61.3million in 2011,¹⁰ 65.1 million in 2013¹¹ and 69.2 million in 2015. The projection for the year 2040 is 123.5 million.¹⁰As per the recently published data from the ICMR-India DIABetes (ICMR-INDIAB) study, conducted across 15 states in India, “the overall prevalence of diabetes in all 15 states of India was 7.3% (95% CI 7.0-7.5), the prevalence of diabetes varied from 4.3% in Bihar (95% CI 3.7-5.0) to 10.0% (8.7-11.2) in Punjab and was higher in urban areas (11.2%, 10.6-11.8) than in rural areas (5.2%, 4.9-5.4; $p<0.0001$) Overall, 1862 (47.3%) of 3938 individuals identified as having diabetes had not been diagnosed previously.”¹¹The important risk factors to be associated with increased risk of diabetes were higher age of the person, male gender, obesity, hypertension, and family history of diabetes

II.MORBIDITY ASSOCIATED WITH DIABETES

Type 2 diabetes mellitus is associated with plethora of physical psychological, economic and social consequences at the personal, family and community level.

II a. Physical complications:

The long term physical complications of diabetes mellitus include micro vascular complications like neuropathy, nephropathy and retinopathy and macrovascular complications like cardiovascular disease, stroke, and peripheral vascular disease.¹²

Cardiovascular disease causes up to 65% of all deaths in people with diabetes and also account for the greatest proportion of morbidity associated with diabetes Mortality rates due to heart disease and stroke are reported to be 2 to 4 times higher among people with diabetes than their normal counterparts. Peripheral vascular

disease (PVD) is another important complication of type 2 diabetes mellitus. In combination with other metabolic derangements and neuropathy, it is an important factor leading to high incidence of foot ulcerations and related complications. Diabetic foot is reported to be the most common cause of non-traumatic amputation of lower limbs across the globe. The adverse consequences of the resulting disability at personal and family level are multidimensional and can seriously impact the quality of life.¹³

Diabetic retinopathy is the most common microvascular complication among people with diabetes and results in more than 10,000 new cases of blindness per year.¹⁴ In 2005, 27% of adults with diabetes who were 75 years of age or older reported some degree of visual impairment compared with 15% of adults with diabetes who were between 18 and 44 years of age. The diminished vision caused by diabetic nephropathy along with other associated complications not only reduces the quality of life of diabetic patients but also put them at serious risk of other consequences like falls, RTA etc. *Diabetic nephropathy* is one of the most common causes of Chronic Kidney Disease (CKD) in India. Recently published data based on the first CKD registry established in India has reported diabetic nephropathy to be accounting for 31% of CKD cases.¹⁵ The need to undergo frequent dialysis, transplantation and associated hospital visits and healthcare expenditure puts these patients at very high risk of developing serious adverse psychological consequences. Diabetic peripheral neuropathy (DPN) is a common complication estimated to affect 30% to 50% of individuals with diabetes^{16, 17}. Along with peripheral vascular disease, neuropathy can lead to non-dramatic lower-extremity amputations (LEAs). As many as 15% of people with diabetes have such amputations during their lifetime. People with diabetes are 10 to 20 times more likely to have LEAs than those without diabetes.¹⁸

IIIb. The psychological impact of diabetes mellitus:

It is widely known that patients with diabetes mellitus (DM) are at high risk of decreased psychological well-being¹⁹⁻²¹, which is already present in about half of the patients at the time of diagnosis²². This is due to strained coping with changed life routine (such as relationships, work-related and financial issues)²³ right from the time of diagnosis of DM²².

The importance of emotional issues in diabetes was first noted over 300 years ago in 1674 by Thomas Willis, who claimed that diabetes was caused by “extreme sorrow.”²⁴ It has been emphasized that there is more to diabetes than just glucose control, and emotions play an important role in diabetes²⁵. The emotional and psychological needs of people living with diabetes are complex.

DM had a negative impact on many aspects of life, ranging from 20.5% on relationship with family or friends to 62.2% on physical health. About 40% (18.6%-64.9%) of these patients reported their medication interfered with their ability to live a normal life²⁶. Furthermore, these patients often use negative coping strategies and more frequently perceive that diabetes would negatively affect their future^{22, 27}.

Untreated psychosocial disorders in DM may lead to more physical symptoms²⁸, cardiovascular complications²⁹ and depression³⁰. Despite the widespread prevalence of psychological problems and their negative consequences, the availability of person-centred chronic illness care and psychological support was low for patients with DM. Only 48.8% had received psychological treatment or educational activities to help manage their diabetes²⁶.

Indian diabetes patients have one of the lowest levels of psychological well-being on the World Health Organization-5 (WHO-5) Well-being Index, which is similar to the global trends. Indian patients also showed a significantly higher perception of the burden of social and personal distress associated with diabetes ³¹. These not only impact the patients' ability to adhere to therapy but also their psychosocial well-being.

II c. Economic and social impact of type 2 diabetes mellitus

Diabetes mellitus accounts for 11% of total health expenditure worldwide, and most people with diabetes live in low- and middle-income countries. This is going to increase up to 40% in a population with particularly high prevalence of diabetes. According to the studies in India, 25% of total family income is allocated to the patient care in a low-income family with one diabetic adult. Studies have shown large regional and socioeconomic differences in the prevalence of type 2 diabetes in India. Self-reported prevalence is lower in rural areas than in urban areas ranging from 3.1% in rural areas to 7.3% in urban areas ³². The economic burden falls heavily on patients and their families and also high costs and suboptimal access to drugs contribute significantly to the burden of the disease.

II. ERECTILE DYSFUNCTION IN DIABETES MELLITUS:

ED has been broadly defined as the inability to achieve or maintain an erection sufficiently rigid for satisfying sexual intercourse. ²

Apart from the well-known adverse consequences, diabetes mellitus has been linked to a plethora of conditions in recent times. The adverse impact of diabetes mellitus on sexual dysfunction is one such aspect, which has been well documented in the literature. But in countries like India, this is one of the most neglected aspects

of diabetes management. A multitude of the patient and healthcare provider related factors are responsible for this phenomenon. Poor literacy, lack of awareness, cultural norms in the country, where open discussion about sexual aspects is stigmatized etc are the key patient-related factors involved. Undue focus on physical complications and lack of awareness among the healthcare practitioners about the negative impact of sexual dysfunction are also equally responsible for underdiagnosis and improper management of erectile dysfunction in the diabetic population.

ASSESSMENT OF ERECTILE DYSFUNCTION:

Considering a lot of subjectivity in how the erectile dysfunction is perceived, many patient-centred structured assessment tools have been evolved to assess the erectile dysfunction. Many of these tools were not only validated for assessment of the presence and severity of erectile dysfunction but also were proved to valid and reliable in assessing the treatment response. Some of the most popular tools include

1. International Index of Erectile Function (IIEF),
2. Erection Hardness Grading Scale (EHGS),
3. Self-Esteem and Relationship Questionnaire (SEAR),
4. Erection Dysfunction Inventory of Treatment Satisfaction (EDITS),
5. Quality of Erection Questionnaire (QEQ),
6. Treatment Satisfaction Scale (TSS) and
7. Psychological and Interpersonal Relationship Scales (PAIRS)

The International Index of Erectile Function (IIEF) ³³ is a widely used, multi-dimensional self-report instrument for the evaluation of the male sexual function. It is has been recommended as a primary endpoint for clinical trials of erectile dysfunction (ED) and for diagnostic evaluation of ED severity. The IIEF was

developed in conjunction with the clinical trial program for sildenafil and has since been adopted as the 'gold standard' measure for efficacy assessment in clinical trials of ED. It has been linguistically validated in 32 languages and used as a primary endpoint in more than 50 clinical trials. It has demonstrated consistent and robust treatment responsiveness in studies conducted widely across the globe. A severity classification for ED has recently been developed, in addition to a brief screening version of the instrument.

Recently an abridged five-item version (IIEF-5) of the International Index of Erectile Function (IIEF) was developed by Rosen RC et al³⁴ to diagnose the presence and severity of erectile dysfunction (ED). The five items selected were based on ability to identify the presence or absence of ED and on adherence to the National Institute of Health's definition of ED. Validation studies have documented a cut-off score of 21 (range of scores, 5-25) had best discriminating validity with 98% sensitivity and 88% specificity. Based on the tolls ED is usually classified into five severity levels, ranging from none (22-25) through severe (5-7).³⁴

Self-Esteem and Relationship (SEAR) questionnaire developed by Cappelleri JC et al contains 14 items resolved into two domains: Sexual Relationship (eight items) and Confidence (six items), the latter comprising Self-Esteem (four items) and Overall Relationship (two items) subscales. It has demonstrated validity and reliability and good psychometric properties n;limited number of studies, but not as widely tested as IIEF questionnaire.³⁵

The QEQ is a brief (six-item) and easy-to-use measure tool developed by **Porst H et al. This tool exclusively** and specifically evaluates satisfaction with the quality of erections from the patient's perspective. This perspective enables the

evaluation of treatment against the perceived need of the patient, and thus the QEQ is a potentially useful measure for use in clinical trials research or in the clinical practice setting.³⁶

EDITS (Erectile Dysfunction Inventory of Treatment Satisfaction) was developed by **Althof SE et al**, to assess satisfaction with medical treatments for erectile dysfunction. The tool has assessed 29 items representing the domain of treatment satisfaction for men and 20 items representing partner satisfaction. The final tool has included 11 patient items in Patient EDITS; 5 items in the Partner EDITS.³⁷

Psychological and Interpersonal Relationship Scales (PAIRS), was developed by **Swindle RW** to evaluate the broader psychological and interpersonal outcomes associated with erectile dysfunction and its treatment. Findings from many studies have concluded that PAIRS demonstrates adequate psychometric properties and well suited for use in further clinical studies of treatments for ED, as it provides a broader assessment of treatment outcome than current measures of erectile function.³⁸

All the above-mentioned tools have their own strengths and limitations. Some of the tools are tested only in specific population groups and were not validated across the globe. Some of the questionnaires were specifically designed for the purpose of treatment response. Very few have taken partner perceptions into consideration. Among the tools, IIEF and its variants are one of the most popular and widely used tools across the globe to assess the presence and severity of erectile dysfunction.³³

IIB. PATHOPHYSIOLOGY OF ERECTILE DYSFUNCTION IN DM: ³⁹

Erectile dysfunction in diabetic patients is reported to be caused by a multitude of interrelated factors. Apart from the direct effects of increased blood glucose levels

and the resulting micro and macrovascular complications, the presence of other co-morbidities and medication are also reported to be associated with Erectile Dysfunction in patients with diabetes mellitus.

The following are the proposed mechanisms of ED in patients with diabetes mellitus:

- Elevated advanced glycation end-products (AGEs)
- Increased levels of oxygen free radicals,
- Impaired nitric oxide (NO) synthesis,
- Decreased and impaired cyclic guanosine monophosphate (cGMP)-dependent kinase-1 (PKG-1),
- Increased endothelin B (ETB) receptor binding sites and ultrastructural changes,
- Upregulated RhoA/Rho-kinase pathway,
- NO-dependent selective nitrergic nerve degeneration

Advanced glycation end-products (AGEs) are the products of non-enzymatic reactions between glucose and lipids, proteins or nucleic acids⁴⁰. AGEs form covalent bonds with vascular collagen, which leads to vascular thickening, decreased elasticity, endothelial dysfunction, and atherosclerosis⁴¹. Studies have shown impaired smooth muscle relaxation in the corpus cavernosum and ED in diabetic rat penises in the presence of AGEs. AGEs decrease compliance in the corpus cavernosum and impair smooth muscle relaxation by generating free radicals or reactive oxygen species (ROS) that react with NO⁴⁰. ROS and superoxide anion have been shown to be elevated in diabetic rat penises. Additionally, superoxide dismutase (an enzyme that accelerates the breakdown of superoxide anion) activity was not increased in these diabetic rat penises. The product of the reaction of ROS and NO is peroxynitrite,

which does not elicit smooth muscle relaxation, and it might be involved in peroxide-induced cell damage and death⁴⁰. AGEs might contribute to diabetic ED by generating oxygen free radicals, which induce oxidative cell damage and quench NO, culminating in decreased cGMP and impaired cavernosal smooth muscle relaxation

Nitric oxide (NO) is produced by the endothelium of the arteries of the penis and nitrergic neurons utilizing endothelial nitric oxide synthase (eNOS) and neuronal nitric oxide synthase (nNOS), respectively. NO mediates relaxation of the corpus cavernosum by the formation of cGMP. It is hypothesized that diabetes impairs the activity of guanylyl cyclase, thereby decreasing the production of cGMP⁴². Furthermore, stimulators of guanylyl cyclase have been shown to improve endothelial and neuronal functions in corpora cavernosa in diabetic mice. Thus decreased NO and its effector molecule, cGMP, participate significantly in the development of diabetic-induced ED. cGMP causes cavernosal smooth muscle relaxation primarily through PKG-1, which alters intracellular calcium levels and opens calcium-dependent potassium channels leading to hyperpolarisation of smooth muscle cells. Studies have suggested that the quantitative and qualitative decrease in PKG-1 might augment diabetic ED by diminished activity of the cGMP intracellular pathway.

There is evidence to suggest that ED in diabetics is linked to an imbalance toward increased penile vasoconstriction as the result of endothelin (ET) and its receptors, and ultrastructural changes in the endothelium.⁴³

Recent research has shown that the transduction pathway for the ET and its receptor might play a role in diabetic ED. The pathway is composed of a GTP-binding protein, RhoA, and its effector agent, Rho-kinase. ET-1 induced vasoconstriction has been shown to be linked to the RhoA/Rho-kinase pathway. The activation of the

pathway suppresses eNOS, decreasing the production of NO. It is proposed that the RhoA/Rho-kinase pathway mediates ED through the decreased production of NO in the penis⁴⁴.

Neurologic testing has shown that diabetics with ED have abnormal nerve conduction, sphincter electromyography, and vibratory testing more commonly than diabetics without ED. Further, patients with diabetic and neuropathic ED have been noted to have similar frequencies of somatic and autonomic neuropathies, suggesting that neuropathy contributes significantly to diabetic ED⁴⁵.

PREVALENCE AND FACTORS ASSOCIATED WITH ERECTILE DYSFUNCTION IN DIABETES MELLITUS:

Rosen RC et al (2009) have conducted multi-center Look AHEAD trial (Action for Health in Diabetes) to determine the prevalence and correlates of erectile dysfunction (ED) in men with type 2 diabetes. The authors have used International Index of Erectile Function (IIEF) to assess erectile dysfunction. “A total of 373 eligible male participants completed all sexual function questionnaires, of whom 263 (68.7%) were sexually active at the time of the study. Almost half (49.8%) of the men reported mild or moderate degrees of ED, and 24.8% had complete ED. ED was significantly associated with age (odds ratio [OR] = 1.05; confidence interval [CI]: 1.01-1.10) baseline HbA(1c) (OR = 1.31; CI: 1.05-1.63), hypertension history (OR = 2.41; CI: 1.34-4.36), and metabolic syndrome (OR = 3.05, CI: 1.31-7.11). Of note, cardio respiratory fitness was found to be protective of ED in a multivariable analysis (OR = 0.61; P < 0.001)”⁴⁶

Ahmed A et al (2011) have conducted a study to assess the prevalence and risk factors of erectile dysfunction among patients attending primary health care center and found the prevalence of erectile dysfunction to be 56.9% (32.7% mild and 2.3% severe cases). The study has reported a lower prevalence of erectile dysfunction in smokers and physically active men. Presence of diabetes was strongly associated with erectile dysfunction in this study, along with presence of obesity, hypertension, coronary heart disease and hypercholesterolemia.⁴⁷

Yamada T et al (2012) have conducted a meta-analysis to assess the relation between erectile dysfunction and cardiovascular events in diabetic men. In this large-scale meta-analysis, which has included studies from 1951 to 2012, a total of 3,791 CV events were reported among 22,586 subjects. The overall odds ratio (OR) of diabetic men with ED versus those without ED was 1.74 (95% confidence interval [CI]: 1.34-2.27; $P < 0.001$) for CV events and 1.72 (95% CI: 1.5-1.98; $P < 0.001$) for coronary heart disease (CHD).⁴⁸

Lopez MC et al (2013) have conducted a study to assess the prevalence of erectile dysfunction among diabetic patients. In this study, the authors have used "international index of erectile function" survey on 120 diabetic men aged between 21 and 50 years. The prevalence of erectile dysfunction was 55% in the study population. Poor glycemic control was positively associated with higher risk of ED with an odd of 5.5 (2.3 to 81) in this study. Based on the study findings, the authors advocated tight glycemic control to prevent erectile dysfunction, along with other complications.⁴⁹

Cander S et al (2014) have evaluated the prevalence of erectile dysfunction (ED) in patients with type 2 diabetes mellitus (T2DM) and its correlates. This analytical cross sectional study has included 116 males with type 2 DM and 48 age-

matched control subjects. Erectile dysfunction (ED) was assessed by International Index of Erectile Function (IIEF-5) Questionnaire. ED scores were significantly lower in patients than controls [14.3 (7.3) vs. 18.2 (6.3), $P=0.004$] with a significantly higher percentage of patients than controls in the category of severe dysfunction (29.4 vs. 10.4%, $P=0.014$). Diabetic polyneuropathy was the only factor reported to be associated with higher likelihood (93.3% in the presence and 60.0% in the absence of neuropathy) and severity (43.3% in the presence and 14.3% in the absence of neuropathy) of ED in this study.⁵⁰

Malavige LS et al (2014) have conducted a study to identify predictors of poor quality of life among men with diabetes from a comprehensive set of sexual, clinical, socio-economic and lifestyle variables. This cross sectional study included 253 men with Type 2 diabetes. “Erectile dysfunction was assessed using the five-item International Index of Erectile Function and quality of life was assessed using the Sri Lankan version of the 36-item short form health survey questionnaire and the disease-specific Psychological Impact of Erectile Dysfunction scale. As per the study, significant predictors on the physical summary scale of the 36-item short form were erectile dysfunction (beta = 7.93, 95% CI 3.70-12.17, $P < 0.001$) and reduced libido (beta = 5.20, 95% CI 0.82-9.59, $P < 0.05$). Predictors on the mental health summary scale of the 36-item short form were erectile dysfunction (beta = 5.82, 95% CI 2.26-9.37, $P < 0.01$), BMI > 27.5 kg/m² (beta = 9.12, 95% CI 1.38-17.44, $P < 0.05$). Significant predictors in the sexual experience scale of the Psychological Impact of Erectile Dysfunction were erectile dysfunction (beta = 6.57, 95% CI 4.63-8.51, $P < 0.001$), reduced libido (beta = 4.33, 95% CI 2.34-6.32, $P < 0.001$) and postural hypotension (beta = 3.99, 95% CI 0.13-7.85, $P < 0.05$). Predictors on the emotional life scale of the Psychological Impact of Erectile Dysfunction were erectile

dysfunction (beta = 2.96, 95% CI 1.37-4.58, P < 0.001), reduced libido 2.75 (beta = 2.75, 95% CI 1.12-4.40, P < 0.01), younger age (beta = 1.05, 95% CI 0.35-1.75, P < 0.01) and postural hypotension (beta = 3.39, 95% CI 0.35-6.45, P < 0.05).” Based on the findings, the authors have reported that erectile dysfunction is a strong predictor of poor generic and disease-specific quality of life among other sexual and clinical variables in men with diabetes.⁵¹

Mutagaywa RK et al (2014) have conducted a study to establish the prevalence of ED and associated risk factors in 312 diabetic patients. In this study, more than half (55.1%) of the patients were found to have some form of ED (12.8% had mild dysfunction, 11.5% moderate and 27.9% severe dysfunction). The severity of ED was correlated with increased age. Multivariate logistic regression revealed that ED was significantly predicted by old age (odds ratio (OR) = 7.1, 95% CI 1.2-40.7), evidence of peripheral neuropathy (OR) =5.9, 95% CI 1.6-21.3), and evidence of peripheral vascular disease (OR =2.5, 95% CI 1.2-5.3). Also, longer duration of DM was marginally associated with ED (p=0.056).¹

El Saghier EO et al (2015) have assessed the prevalence of androgen deficiency and erectile dysfunction (ED) and their relation to glycemic control among 70 men with T2DM. ED was assessed by a five-item version of the International Index of Erectile Function-5. “Low Serum Testosterone (LST) was found in 40% of studied men, and 92.9% of them reported overt symptoms of androgen deficiency. ED was detected in 85.7% of those with LST, as opposed to 31.0% of those with normal TT (P < 0.000). TT was lower in diabetic men with ED compared to those without ED (12.04 +/- 5.36 vs. 17.11 +/- 7.11 nmol/L, P < 0.001).”⁵²

Mazzilli R et al (2015) have evaluated the prevalence and correlates of erectile dysfunction among 934 diabetic subjects referred to an andrology unit. ED was evaluated using IIEF-5 questionnaire. The prevalence of subjects affected by DM in a population of men with ED was 19.5% (182/934). No significant differences were found in DM onset timing or in anti-diabetic treatment. In 125/182 cases (68.7%) the ED onset followed the diagnosis of DM; in 34/182 cases (18.7%) it appeared at the same time, and in 23/182 cases (12.6%) appeared before DM diagnosis. Basing on the study findings, the authors have concluded that, DM is one of the most frequent organic causes of ED; there were many strategies to treat this symptom without interfering with the anti-diabetic treatment.⁵³

Rutte A et al (2015) have conducted a study, aimed to assess the prevalence and correlates of sexual dysfunction in a sample of Dutch men and women with type 2 diabetes. In this study, on the basis of predefined criteria, 69% of men and 70% of women were classified with some degree of sexual dysfunction. Univariable logistic regression analyses revealed that sexual dysfunctions were associated with higher age, clinical depression (Centre for Epidemiological Studies score ≥ 16), and one or more diabetes-related complications in both men and women. Multivariable logistic regression analyses revealed that clinical depression was most strongly associated with both male (OR = 6.87, 95% CI [1.77, 26.63]) and female (OR = 9.33, 95% CI [1.03, 84.87]) sexual dysfunction. The authors have emphasized the need to screen and manage sexual dysfunction in diabetes patients.⁵⁴

Binmoammar TA et al (2016) have assessed the impact of poor glycemic control on the prevalence of erectile dysfunction in men with type 2 diabetes mellitus, in their systematic review. The authors have included studies, which have used

HbA1c to assess the level of glycemic control and IIEF-5 to assess Erectile dysfunction. Out of the five cross-sectional studies included, three studies showed a significant positive association, while one study showed only a weak correlation and one study showed borderline significance. Patients' age, diabetes mellitus duration, peripheral neuropathy and body mass index had a positive association with erectile dysfunction. However, smoking and hypertension were not associated with erectile dysfunction in most included studies. Physical activity had a protective effect against erectile dysfunction.”⁵⁵

Caretta N et al (2016) have attempted to assess the role of Hypovitaminosis D in causing erectile dysfunction in type 2 diabetes. This observational study has included, 92 T2DM males, who were evaluated by International Index of Erectile Function (IIEF-5) questionnaire. In this study, “T2DM patients with lower 25(OH)D levels (<25 nmol/l) showed higher penile IMT ($p < 0.05$), waist circumference ($p < 0.05$), glucose concentrations ($p < 0.05$), and lower IIEF-5 score ($p < 0.005$), testosterone concentrations ($p < 0.05$), and cavernous peak systolic velocity (PSV) ($p < 0.05$), compared to patients with 25(OH)D >50 nmol/l. 25(OH)D levels were directly correlated with IIEF-5 ($R = 0.39$; $p = 0.0001$), testosterone ($R = 0.24$; $p = 0.02$), and PSV ($R = 0.24$; $p = 0.04$) and inversely with waist ($R = -0.33$; $p = 0.002$), HbA1c ($R = -0.22$; $p = 0.03$), triglyceride ($R = -0.21$; $p = 0.06$), and penile IMT ($R = -0.30$; $p = 0.009$). At multivariate analysis, 25(OH)D deficiency remained an independent predictor of ED.”⁵⁶

Hackett G et al (2016) in their review have highlighted the fact that “Erectile dysfunction (ED) has been well recognized as a marker of increased cardiovascular risk in men with type 2 diabetes mellitus. The authors have cited the evidence

reporting a window of opportunity of 3 to 5 years from the onset of ED to subsequent cardiovascular events, which is usually missed by clinicians. The important reason identified for this is the fact that, the usual practice of putting the onus on the patient to seek care for his sexual problems across the globe. The reviewers have recommended active screening of all type 2 diabetic patients, considering its strong association with subsequent cardiovascular events and manage these patients aggressively, not only with lifestyle modifications but also with appropriate medical treatment.⁵⁷

Chen S et al (2017) have estimated the prevalence of erectile dysfunction (ED) and the level of psychological distress and their interrelationship in men with type 2 diabetes mellitus. In this study of 335 men, International Index of Erectile Function scale (IIEF-5) was used to assess the ED and psychological distress was assessed by Symptom Checklist 90-Revised (SCL-90-R). In this study “ED was more prevalent in type 2 diabetic men than that in the control group (58.51% vs. 26.76%, $P < 0.001$). All subscale scores of SCL-90-R were significantly higher in the group with type 2 diabetes (N=335) than those in the group without type 2 diabetes (N=284). All scores of SCL-90-R subscales were inversely correlated with the IIEF-5 score. Hence basing on the findings, they have concluded that ED and psychological distress were strongly correlated in type 2 diabetic patients and advocated Clinicians to be aware of the association, to diagnose and manage it appropriately”.⁵⁸

Furukawa S (2017) has attempted to assess the association between depressive symptoms and ED among 469 male Japanese patients with type 2 diabetes mellitus. Sexual Health Inventory for Men score was used to assess ED and depression were assessed by Self-Rating Depression Scale (SDS) score. “The prevalence values of

depressive symptoms, moderate to severe ED and severe ED were 15.1%, 64.2%, and 51.0%, respectively. Depressive symptoms were independently positively associated with moderate to severe ED and severe ED (adjusted odds ratios were 2.23 (95% confidence interval (CI): 1.17-4.43) and 1.86 (95% CI: 1.04-3.41), respectively).”⁵⁹

Kouidrat Y et al (2017) in their latest systematic review and meta-analysis, of 145 studies published from across the globe, have estimated the relative prevalence of erectile dysfunction. The authors have included studies which have compared, ED prevalence among diabetic patients with that of normal controls, with an aim of calculating relative risk of ED due to diabetes mellitus. As per this meta-analysis “the prevalence of erectile dysfunction in diabetes overall was 52.5% (95% CI, 48.8 to 56.2) after adjusting for publication bias, and 37.5%, 66.3% and 57.7% in Type 1, Type 2 and both types of diabetes, respectively (P for interaction < 0.0001). The prevalence of erectile dysfunction was highest in studies using the Sexual Health

Inventory for Men (82.2%, 17 studies, P for interaction < 0.0001). Studies with a higher percentage of people with hypertension moderated our results (beta = 0.03; 95% CI, 0.008 to 0.040; P = 0.003; R² = 0.00). Compared to healthy controls (n = 5385) men with diabetes (n = 863) were at increased odds of having erectile dysfunction (OR 3.62; 95% CI, 2.53 to 5.16; P < 0.0001; I² = 67%, k = 8). Based on the findings, the authors have emphasized the high prevalence of Erectile dysfunction in diabetes with almost 3.5 times more risk of developing it as compared to controls. Hence they have active screening and appropriate intervention.⁶⁰

Seid A et al (2017) have assessed the prevalence and determinants of erectile dysfunction, among diabetic patients. In this hospital-based cross-sectional study, the authors have studied, 249 males suffering from diabetes mellitus. The mean age of

study participants was 43.39 years and the mean duration of diabetes diagnosis was 6.22 years. The overall prevalence of erectile dysfunction was 69.9%, with 32.9% suffering from mild, 31.7% moderate, and 5.2% severe erectile dysfunction. Multivariate logistic regression revealed that erectile dysfunction was significantly predicted by old age (Adjusted Odds Ratio [AOR] =15.013, CI:3.212-70.166), longer duration of diabetes (AOR = 3.77, CI:1.291-11.051), and lower monthly income (AOR = 0.285, CI:0.132-0.615). No association was found with body mass index, comorbidity, glycemic control, and alcohol consumption.”⁷ This study had also emphasized the fact that 97% of ED patients identified in the study are newly diagnosed and were never screened before during their routine care. Hence they have concluded that ED is not only highly prevalent but one of most under diagnosed and neglected aspect in diabetic patients.

IMPACT OF ED ON QOL OF DIABETIC PATIENTS:

Many studies have demonstrated that patients with ED showed higher levels of frustration and discouragement. The most alarming reports by the studies have also documented that the patients with ED had lower acceptance of diabetes, which was, in turn, related to worse metabolic control and higher levels of depressive symptoms. These associations remained highly significant, even after adjusting the analyses for clinical and patient-related characteristics, thus excluding the possible confounding effect of other variables.⁶¹⁻⁶⁶

Another important association reported in diabetic population was an association between ED and risk of depression. It has also been recently suggested

that the effects of depressive symptoms, cardiovascular disease, and ED are mutually reinforcing.

II E. PREVENTION AND TREATMENT OF ED IN DIABETES MELLITUS:⁶⁷

There is very effective treatment option available for diabetic patients with erectile dysfunction, depending on the severity and nature of the erectile dysfunction. These treatments, apart from their direct effect on improving the quality of sexual life of the patient, are proven to have a lot of indirect positive effects on Diabetic patients.

The therapeutic options for erectile dysfunction in Diabetic population include both Medical and surgical modalities of management. The most commonly used medical therapies include oral agents like Phosphodiesterase inhibitors or Intracavernosal vasoactive injections like table papaverine, phentolamine and Prostaglandin (PGE1) etc. Intraurethral suppositories of PGE1, use of Vacuum constriction devices and Testosterone Replacement Therapy etc. were the other medical therapeutic options with proven efficacy in selected groups of erectile dysfunction patients.

Surgical therapies like Penile implants have also been documented to be effective for patients with ED when pharmacologic therapy fails or are contraindicated and/or who patients do not tolerate vacuum erection devices.

Overall at the end of the review, the key lacunae identified in the literature are the relative scarcity of the studies on Indian diabetic population documenting the prevalence and severity of the erectile dysfunction. The risk factors that are associated with erectile dysfunction which can aid in the selective screening of patients are also

poorly understood, due to serious methodological limitations in the existing studies. The overall and long term impact of the ED on quality of life, compliance with diabetes treatment and long term complications is also poorly explored aspect as there was alimited number of large-scale prospective studies conducted on the subjects.

The key fact highlighted by the review is that ED is highly prevalent and ignored aspect of diabetes mellitus due to all the above-mentioned factors. On the other hand, the tendency of physicians not to investigate sexual problems in diabetic patients and the need for clinician-initiated discussion regarding this issue have also been recently pointed out by many studies. Both general practitioners and specialists should thus increase their attention to sexual disorders, which are often not considered an important medical problem or are overshadowed by other medical conditions. Encouraging patients to openly discuss these problems could reassure them about the availability of successful and reasonably safe treatments. It would also allow an effective investigation, beyond sexual dysfunction, of the relevant additional risk of mainly cardiovascular morbidity and mortality conferred by the concomitant presence of ED and depression.

METHODOLOGY

Study design: The study was a cross sectional study

Study setting: The study was conducted in the department of general medicine, KLE'S Prabhakar Kore Hospital, Belagavi, Karnataka

Study population: All the sexually active male patients presenting to the study setting, who are known cases of type 2 diabetes mellitus were considered as study population.

Study period: The data collection for the study was done over a period of 12 months from January 2016 to January 2017

Sample size: Sample size was calculated assuming the prevalence of erectile dysfunction to be 37 %, as per the study by Goya et al.⁶⁸(Since the reference study has documented the prevalence of 37% mild, 26.1% moderate and 14% severe ED, the sample size was calculated assuming the proportion, which gives the highest possible sample size among the three i.e. 37%)

The other parameters considered for sample size calculation were 5% absolute precision and 95% confidence level. The following formula to calculate sample size for prevalence studies was used to calculate sample size as recommended by Daniel WW et al.

$$n = \frac{Z^2 P(1 - P)}{d^2}$$

Where n = Sample size

Z = Z statistic for a level of confidence,

P = Expected prevalence of proportion

(If the expected prevalence is 20%, then $P= 0.2$), and

d = Precision (If the precision is 5%, then $d=0.05$).

As per the above-mentioned calculation, the required numbers of subjects for the study were 359. TO account for a non-participation rate of 10%, another 10% of the subjects (36) were added to the required sample size making a total sample size requirement of 395 subjects. Hence the minimum sample size required was 395 subjects

To facilitate better subgroup analysis, it was decided to include as many subjects as possible, more than the minimum sample required during the data collection period. Hence the study had included a total of 509 subjects in the final analysis.

Sampling method: All the study participants were recruited sequentially by purposive sampling till the sample size is reached

Inclusion criteria:

Men aged at least 20 years who had diabetes mellitus for at least one year were included.

Exclusion criteria:

1. All subjects of spinal cord injury.
2. All subjects with pelvic surgery / pelvic fracture or H/O pelvic radiation.
3. All subjects of drug abuse (Recreational substances).
4. Patients with psychiatric disorders on mood elevators or antipsychotic drugs

5. The very sick patients which for purpose of this study was defined as: Patients with unstable vital signs/mental status e.g. in diabetic ketoacidosis or hyperosmolar hyperglycemic state, confused, or in septicemia as in infected diabetic foot.

Methodology:

During recruitment, the principal investigator (PI) filled in a standardized structured questionnaire for each patient included in the study. The questionnaire included socio-demographic and clinical aspects data. To assess the different sexual domains the International Index of Erectile Function (IIEF-5) Questionnaire was used. The investigator asked all the questions. The possible scores for the IIEF-5 range from 5 to 25, and ED was classified into five categories based on the scores: severe (5-7), moderate (8-11), mild to moderate (12-16), mild (17-21), and no ED (22-25).⁶⁹

Measures included Socio-demographic data and Medical history regarding the duration of diabetes, type of diabetes, medications taken for diabetes; the presence of comorbid conditions was obtained. Moreover, anthropometric measurements were recorded and blood for laboratory tests was taken.

Height (in meters) was taken using a commercially available stadiometer (AXIOM, AX - 120) and weight (in kilograms) was measured using a standard weighing. The body mass index (BMI) was derived by dividing the weight (kg) by the square of the height (m) and classification of obesity was done according to World Health Organization [17] criteria.

Blood pressure measurement using standard well-calibrated mercury sphygmomanometer based was taken. Hypertension was defined as SBP \geq 140mmHg and/or DBP \geq 90mmHg or known hypertensive on treatment.

The 10g Semmes Weinstein monofilament was used to screen diabetic patients for peripheral neuropathy. Patients were asked to close their eyes while the monofilament is pressed perpendicular 9 areas of the plantar surface and one on the dorsal surface of the feet until it buckles. The patients were asked to say 'Yes' each time they feel the filament. Failure to feel the filament at 4 of 10 sites is 97% sensitive and 83% specific for identifying loss of protective sensation

Patients were screened for diabetic nephropathy by confirming the presence of urine microalbuminuria along with the renal function tests. Fundoscopy was performed to assess the presence of diabetic retinopathy

Fasting blood samples for total serum cholesterol, high-density lipoproteins (good cholesterol), low-density lipoprotein (bad cholesterol), serum triglycerides and blood glucose, glycosylated hemoglobin, TSH and T4, urea and serum creatinine estimation was taken. Five milliliters of venous blood was taken from the antecubital fossa and placed in empty sterile tubes. The samples were taken to the laboratory for analysis within a day.

Ethical issues

The study was approved by the institutional human ethics committee. Informed written consent was obtained from the subjects, after thoroughly explaining the study objectives, risks, and benefits involved, purely voluntary nature of participation. Confidentiality of the study participants was maintained throughout the conduction and reporting of the study findings.

Statistical analysis:

Presence of erectile dysfunction was considered as primary explanatory

variable. Various sociodemographic variables like age, diabetes mellitus related factors, co-morbidities, treatment-related factors as detailed in methodology were considered as explanatory variables.

Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency, and proportion for categorical variables. Data was also represented using appropriate diagrams like bar diagram and pie diagram.

The association between categorical explanatory variables and ED was assessed by cross-tabulation and comparison of percentages. Odds ratio along with 95% CI is presented. Chi square test was used to test statistical significance. Univariate and multivariate logistic regression analysis was used to assess the final list of factors associated with ED in the study population.

P value < 0.05 was considered statistically significant. IBM SPSS version 22 was used for statistical analysis.⁷⁰

RESULTS

A total of 509 subjects were included in the final analysis

Table.1: Descriptive analysis for Age in study population (N=509)

Parameter	Mean \pm STD	Min	Max
Age	51.08 \pm 9.40	23.00	80.00

The mean age was 51.08 \pm 9.40 .The youngest person was aged 23 years and eldest was aged 80 years in the study population. (Table 1)

Table.2: Descriptive analysis of Age Group in study population (N=509)

Socio Demographic variables	Number	Percent
Age Group		
21 to 30	9	1.77%
31 to 40	67	13.16%
41 to 50	149	29.27%
51 to 60	231	45.38%
61 to 70	45	8.84%
71 to 80	8	1.57%
Education		
Illiterate	105	20.63%
Up to Secondary School	137	26.92%
Graduation and above	267	52.46%
RELIGION		
Hindu	480	94.30%
Christen	12	2.36%
Muslim	17	3.34%

Among the study population, the number of subjects in age group of 20 to 30 years was 9 (1.77%), in 31 to 40 years was 67 (13.16%), 41 to 50 years was 149 (29.27%), 51 to 60 years was 231 (45.38%), 61 to 70 years was 45 (8.84%) and 71 to 80 years was 8 (1.57%). (Table 2 &Figure 1) Among the study population, 105 (20.63%) were

illiterate, 137 (26.92%) studied till Secondary School level and 267 (52.46%) were educated till Graduation and beyond (Table 2 & Figure 2) Among the study population, the Religion was Hindu in 480 (94.30%), Christen in 12 (2.36%), and Muslim in 17 (3.34%) subjects. (Table 2)

Figure.1: Bar chart of Age Group distribution in study population (N=509)

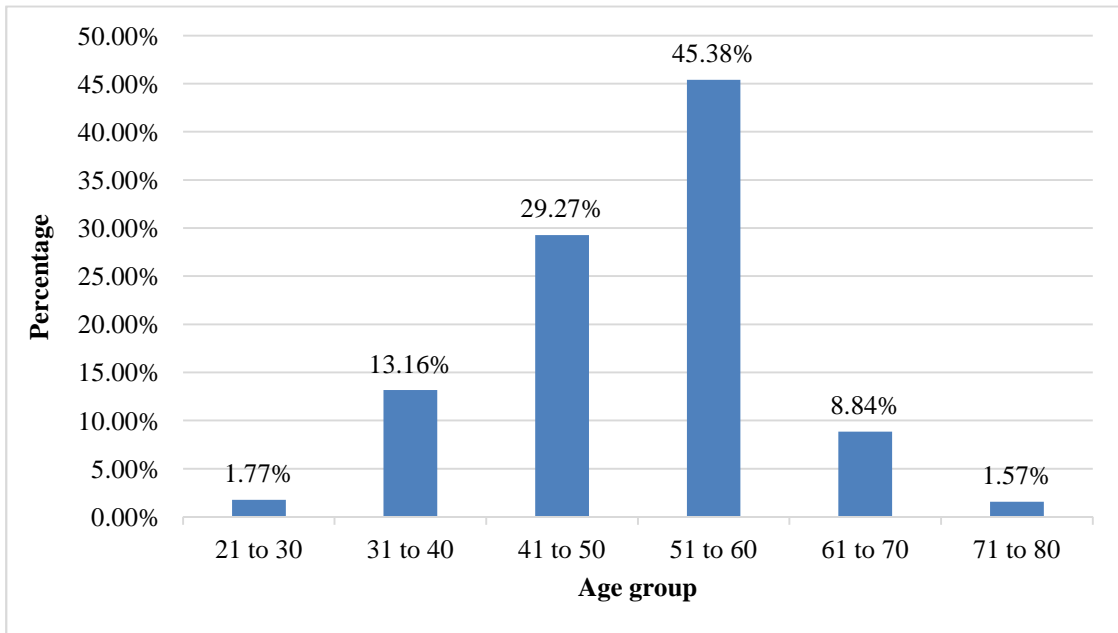


Figure.2: Bar chart of Education in study population (N=509)

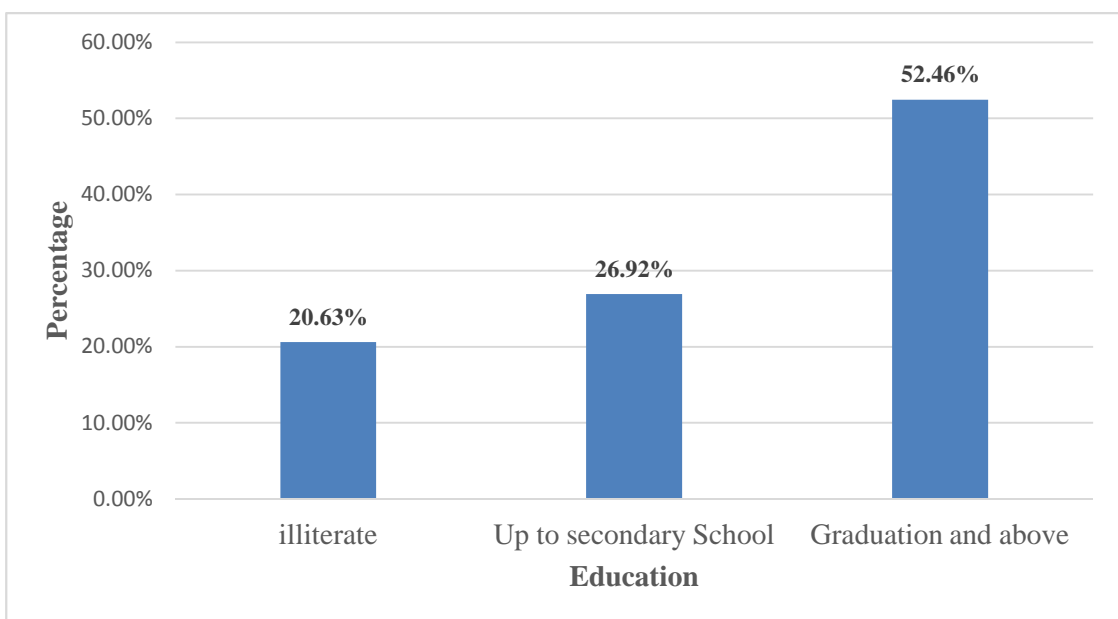


Table.3: Descriptive analysis of any number of children in study population (N=509)

Number of Children's	
0 N (%)	12(2.36%)
1 N (%)	46(9.04%)
2 N (%)	285(55.99%)
3 N (%)	106(20.83%)
4 and more N (%)	60(11.79%)
Duration of married life (Mean SD)	25.12 ± 9.964

Among the study population, only 12 (2.36%) had no children. The number of people with 1, 2, 3, and 4 or more children was 12(2.36%), 46(9.04%), 285(55.99%), 106(20.83%), and 60(11.79%) respectively. (Table 3 & Figure3) The mean Duration of married life was 25.12 ± 9.964. (Table 3)

Figure.3: Pie chart of Children distribution in study population (N=509)

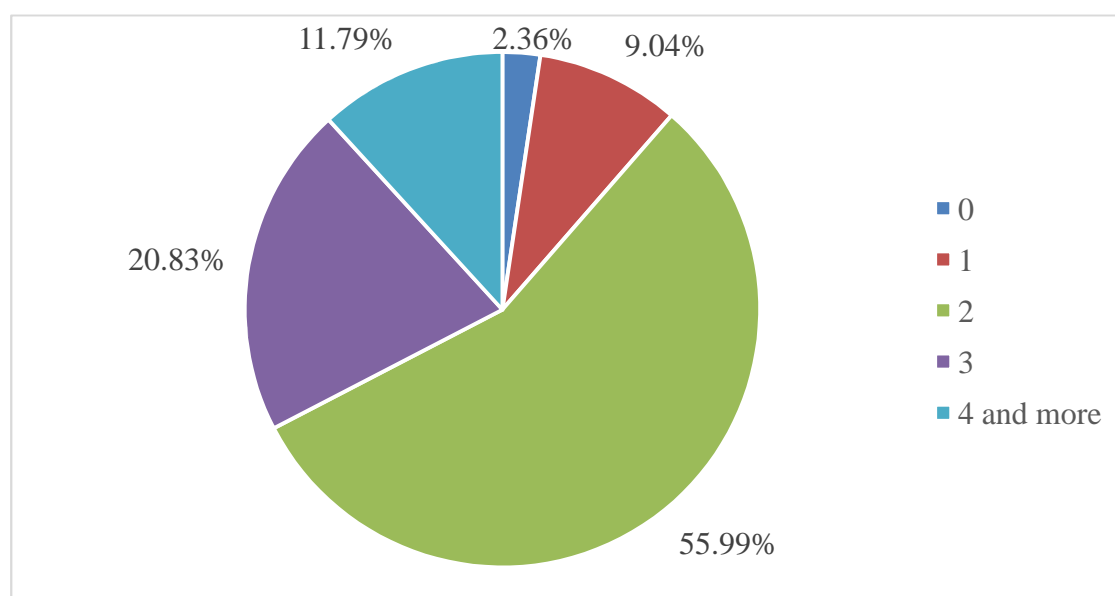


Table.4: Descriptive analysis of BMI Group in study population (N=509)

Body Mass Index (BMI)	Number	Percentages
Underweight	29	5.70%
Normal	265	52.06%
Obese 1	157	30.84%
Obese 2	50	9.82%
Obese 3	8	1.57%

Among the study population, the number of subjects who were underweight was 29(5.70%); Normal BMI was seen in 265 (52.06%) people. The number of people in Obese 1, Obese 2 and Obese 3 category was 157 (30.84%), 50 (9.82%) and 8 (1.57%) respectively. (Table 4 & Figure 4)

Figure 4: Pie chart of BMI Group in study population (N=509)

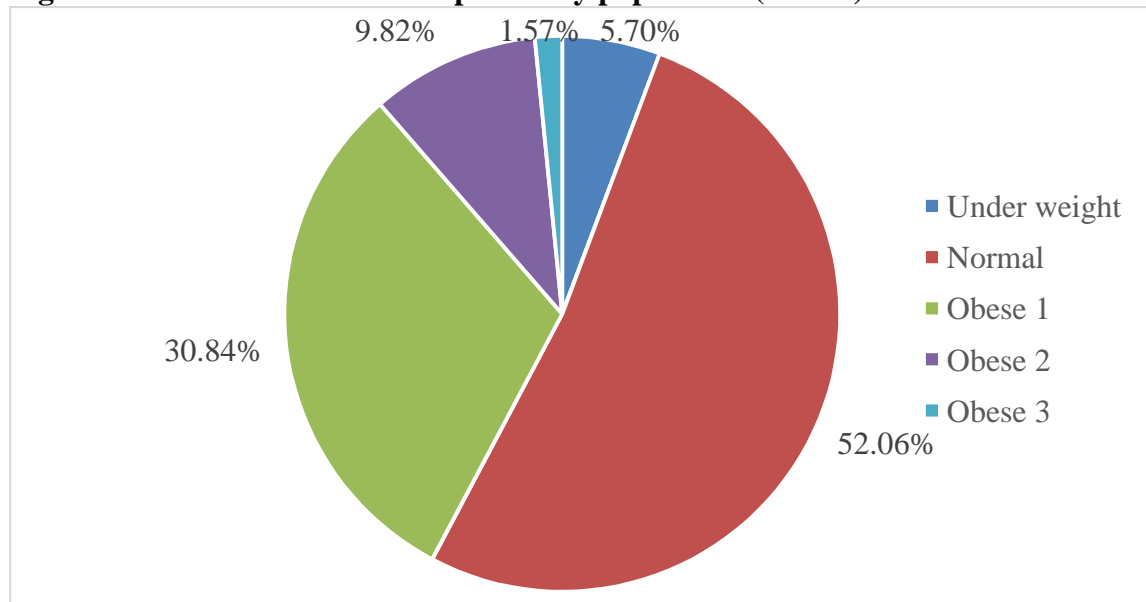


Table.5: Descriptive analysis for DM Duration, Duration in study population (N=509)

Parameter	Mean \pm STD	Median	Min	Max	95% C.I. for EXP(B)	
					Lower	Upper
DM Duration	9.517 \pm 5.743	8.00	0.60	38.00	9.01	10.02

The mean Duration of diabetes mellitus was 9.517 \pm 5.743 years in the study population. The minimum Duration was 0.60 years and the maximum Duration was 38 years (Table 5)

Table.6: Descriptive analysis of Glycaemic status of study population (N=509)

Glycaemic control	Number	Percentages
Good-HbA1c<7	14	2.75%
Poor- HbA1c 7-9	55	10.81%
Very Poor- HbA1c >9	440	86.44%

Among the study population, only 14 (2.75%) had good glycaemic control. The proportion of subjects with poor and very poor glycaemic control was 10.81% and 86.44% respectively. (Table 6 &Figure5)

Figure.5: Pie chart of Glycaemic control distribution in study population (N=509)

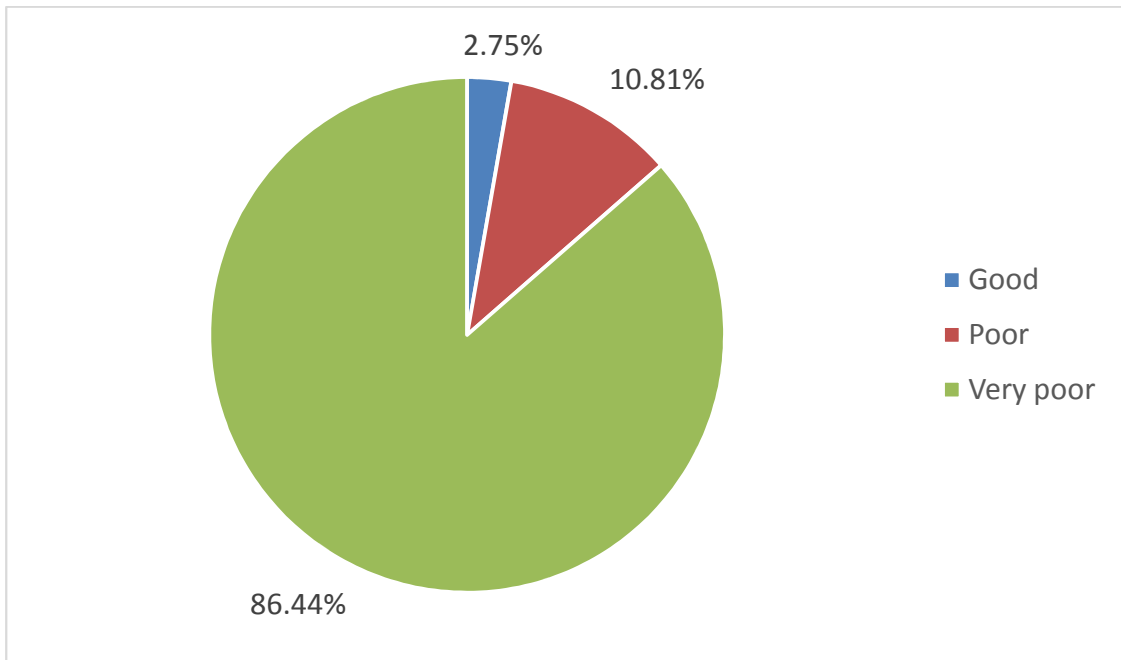


Table.7: Descriptive analysis of Co morbidities in study population (N=509)

Parameter	Number	Percent
Hypertension	194	38.1%
Hyper Cholesterolemia	88	17.29%
Alcohol consumption	95	18.66%
Smoking	62	12.18%
Tobacco consumption	67	13.16%

Among the study population, the number of people with hypertension was 194 (38.1%);Hyper Cholesterolemia was seen in 88 (17.29%). Alcohol consumption was reported by 95 (18.66%), Smoking was reported by 62 (12.18%) and Tobacco consumption was reported by 67 (13.16%). (Table 7)

Table.8: Descriptive analysis of T4 group and TSH Group in study population (N=509)

Parameters	Number	Percentages
T4 Group		
Normal	500	98.23%
Low	5	0.98%
High	4	0.79%
TSH Group		
Normal	478	93.91%
Low	20	3.93%
High	11	2.16%

Among the study population, the normal T4 was seen in 500 subjects (98.23%);Low was seen in 5 (0.98%) and High in 4 (0.79%). (Table 8 &Figure6)

Among the study population, 478(93.91%) subjects had normal TSH; Low was seen in 20 (3.93%) and High in 11 (2.16%). (Table 8 &Figure7)

Figure.6: Pie chart of T4 Group distribution in study population (N=509)

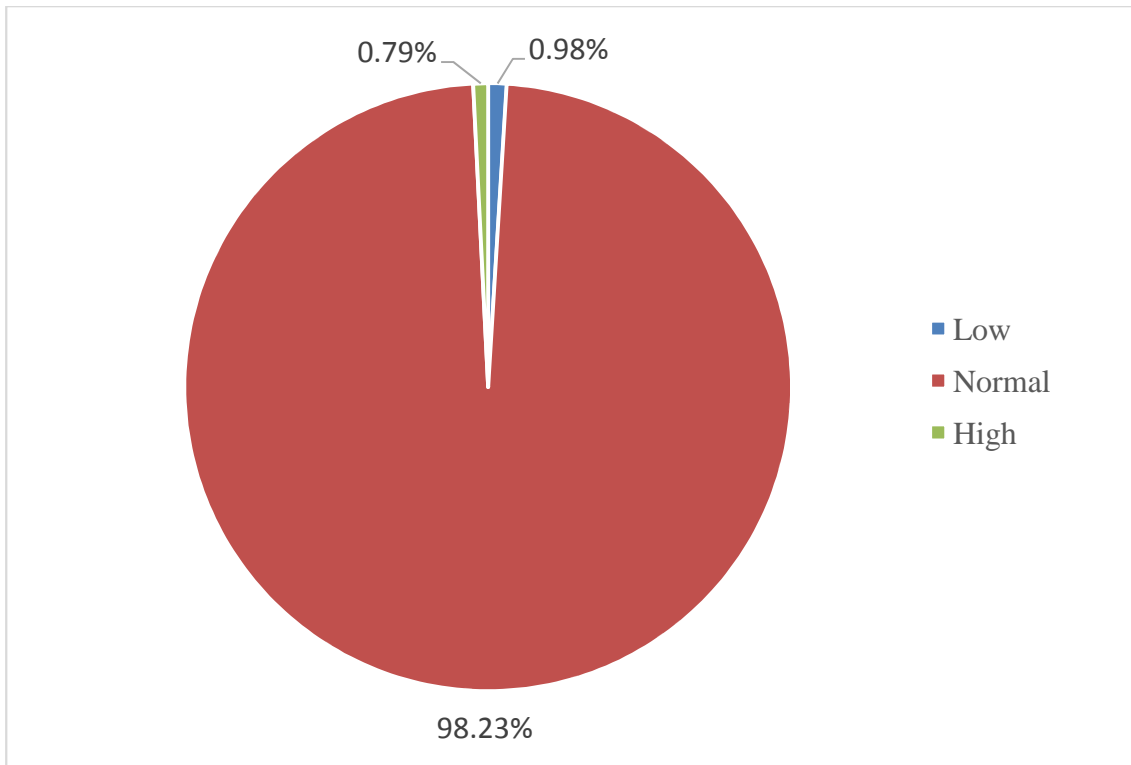


Figure.7: Pie chart of TSH Group distribution in study population (N=509)

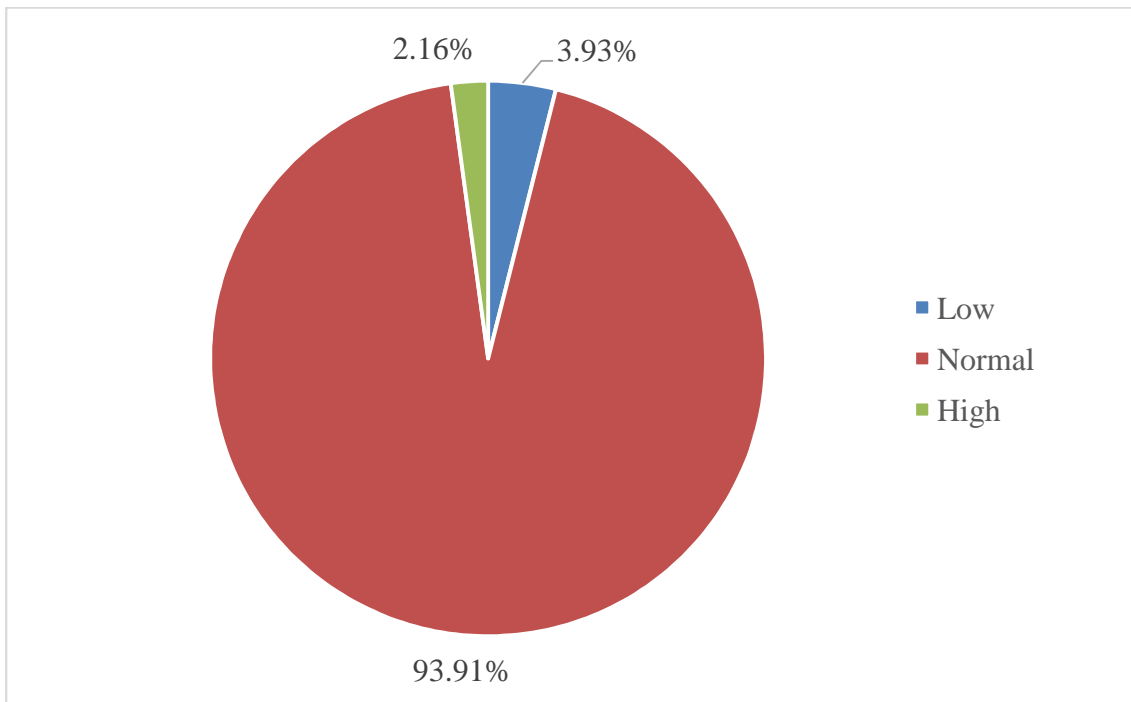


Table.9: Descriptive analysis of Component of metabolic syndrome in study population (N=509)

Component of metabolic syndrome	Number	Percentage
Waist Circumference		
High	218	42.82%
Normal	291	57.17%
TGL		
High (150)	278	54.62%
Normal (150)	231	45.38%
HDL Category		
Normal(40)	177	34.77%
Low(40)	332	65.23%
HYPERTENSION		
yes	194	38.11%
no	315	61.89%
FBS		
High(100)	68	13.36%
Normal(99.99)	441	86.64%

Among the study population, the proportion of people with high waist circumference was 218 (42.82%). The proportion of subjects with high TGL, low HDL, hypertension and high FBS were 54.62%, 65.23%, 38.11% and 13.36% respectively.

Table.10: Prevalence of Metabolic syndrome in study population (N=509)

Metabolic syndrome	Number	Percentage
Yes	186	36.54%
NO	323	63.46%

Among the study population, the prevalence of Metabolic Syndrome was 36.54%.
(Table 10)

Table.11: Descriptive Analysis of Complications of Diabetes Mellitus in Study Population (N=509)

Parameter	Number	Percent
IHD	39	7.66%
Retinopathy	208	40.86%
Neuropathy	325	63.85%
Nephropathy	14	2.75%

Among the study population, 39 (7.66%) people had Ischemic Heart Disease in the past. Retinopathy was seen in 208 (40.86%), Neuropathy was seen in 325 (63.85%) and Nephropathy was seen in 14 (2.75%) people. (Table 11)

DESCRIPTIVE ANALYSIS OF OUTCOME:**Table.12: Frequency of persons with Desire (N=509)**

Desire category	Number	Percentage
Yes	483	94.89%
No	26	5.11%

Among the study population, the presence of sexual desire was reported by 483 (94.89%) people. (Table 12)

Table.13: Descriptive analysis of ED Score in study population (N=509)

ED Score	Number	Percentage
Present	303	59.53%
Absent	206	40.47%

Among the study population, the prevalence of Erectile dysfunction was 59.53%. (Table 13 & Figure 8)

Figure 8: Pie chart of ED (erectile dysfunction) Score in study population (N=509)

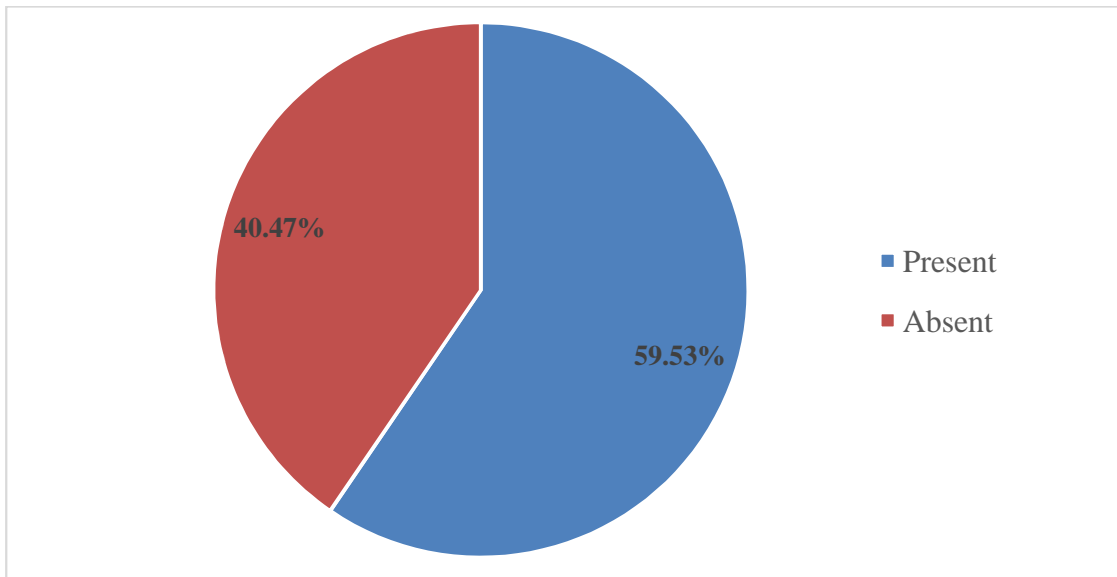


Table.14: Descriptive analysis of ED Score in study population (N=509)

Erectile dysfunction	Number	Percentages
No ED	206	40.47%
Mild	139	27.31%
Mild - Moderate	98	19.25%
Moderate	27	5.30%
Severe	39	7.66%

As per the severity of ED is concerned, ED was mild in 139 (27.31%), Mild-moderate ED was seen in 98 (19.25%), Moderate ED was seen in 27 (5.30%) and Severe ED was seen in 39 (7.66%) subjects. (Table 14& Figure9)

Figure.9: Pie chart of ED Score distribution in study population (N=509)

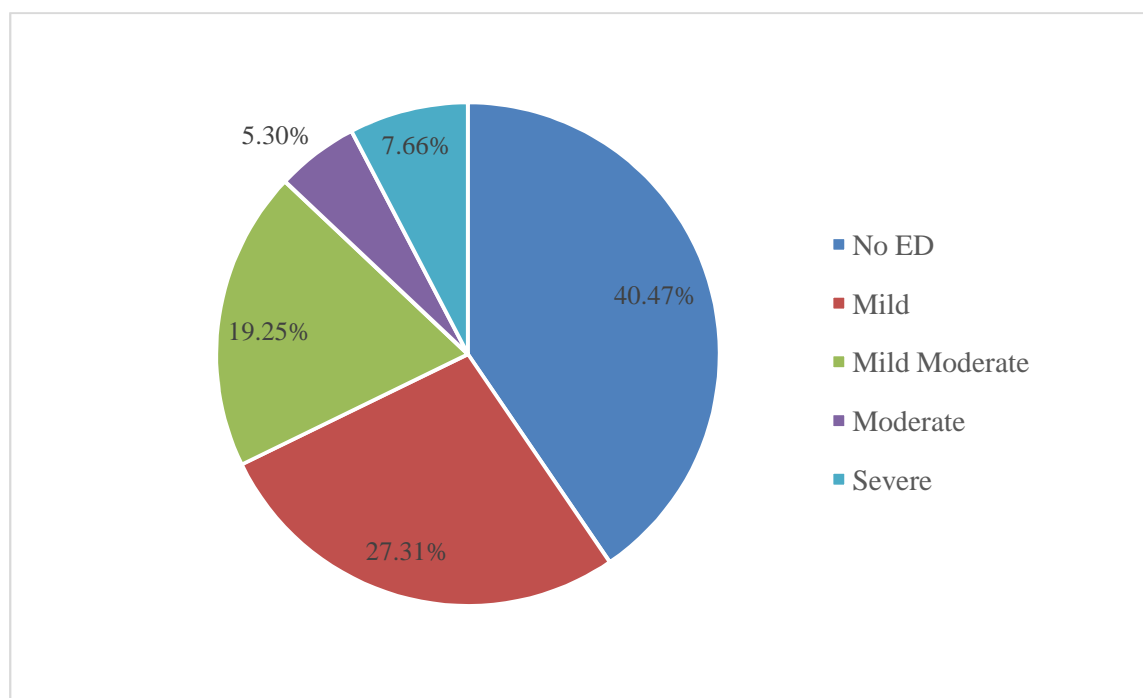


Table.15: Descriptive analysis for ED duration, in study population (N=509)

Parameter	Mean \pm STD	Median	Min	Max	95% C.I. for EXP(B)	
					Lower	Upper
ED duration	4.719 \pm 5.434	4.00	0.00	30.00	4.25	5.19

The mean ED Duration was 4.719 \pm 5.434. The minimum Duration was 0 and the maximum Duration was 30.00(95% CI 9.01 - 10.02). (Table 15)

Table.16: Association of ED Score-Category with Age Group of study population (N= 509)

Age Group	ED Score		Chi square	P-value
	Present	Absent		
Below 40	18 (23.68%)	58 (76.31%)	66.63	<0.001
41 to 50	77 (51.67%)	72 (48.32%)		
51 to 60	168 (72.72%)	63 (27.27%)		
Above 60	40 (75.47%)	13 (24.52%)		

Among the study population, among below 40 years age group, the proportion of ED was 23.68%. The prevalence of ED had constantly increased with increasing age group. It was 51.67% in 41 to 50 years, 72.72% in 51 to 60 years and 75.47% in above 60 year age group. The difference in the proportion of ED across different age groups was statistically significant (P value <0.001). (Table 16)

Table.17: Association of ED Score with Education of study population (N=509)

EDUCATION	ED Score		Chi square	P-value
	Present	Absent		
Illiterate	64 (60.95%)	41 (39.04%)	0.162	0.92
Up to secondary school	80 (58.39%)	57 (41.60%)		
Graduation and above	159 (59.55%)	108 (40.44%)		

Among the study population, the proportion of ED was 60.95%, 58.39% and 59.55% in illiterates, people studied up to secondary school and in people educated till Graduation and above, respectively. This association was statistically not significant. (P value <0.92) (Table 17)

Table.18: Association of ED Score with Religion of study population (N= 509)

RELIGION	ED Score		P-value
	Present	Absent	
Christen	10 (83.33%)	2 (16.66%)	0.14
Hindu	281 (58.54%)	199 (41.45%)	
Muslim	12 (70.58%)	5 (29.41%)	

No statistically significant association was found between religion and erectile dysfunction in study population (P value <0.14) (Table 18)

Table.19: Association of ED Score with Marital Status and Children of study population (N= 509)

Number of Children	ED Score		Chi square	P-value
	Present	Absent		
0	7 (58.33%)	5 (41.66%)	6.529	0.16
1	26 (56.52%)	20 (43.47%)		
2	158 (55.43%)	127 (44.56%)		
3	72 (67.92%)	34 (32.07%)		
4 and more	40 (66.66%)	20 (33.33%)		

No statistically significant association was found between the number of children and erectile dysfunction in study population (P value 0.16) (Table 19)

Table.20: Association of ED Score with Glycemic Control of study population (N=509)

GLYCEMIC CONTROL	ED Score		Chi square	P-value
	Present	Absent		
Good	3 (21.42%)	11 (78.57%)	14.57	<0.001
Poor	25 (45.45%)	30 (54.54%)		
Very poor	275 (62.5%)	165 (37.5%)		

Among the study population, the prevalence of ED was highest in people with very poor glycemic control (62.5%), followed by 45.45% in people with poor glycemic control and least in people with good glycemic control. The association between glycemic control status and Erectile dysfunction was statistically significant (P value <0.001) (Table 20)

Table.21: Association of ED Score with T4 Group and TSH of study population (N= 509)

T4 Group	ED Score		Chi square	P-value
	Present	Absent		
Low	1 (20%)	4 (80%)	3.440	0.18
Normal	300 (60%)	200 (40%)		
High	2 (50%)	2 (50%)		
TSH Group				
Low	12 (60%)	8 (40%)	0.117	0.94
Normal	285 (59.62%)	193 (40.37%)		
High	6 (54.54%)	5 (45.45%)		

No statistically significant association was found between T4 levels and erectile dysfunction in study population (P value <0. 18). No statistically significant association was found between TSH levels and erectile dysfunction in study population (P value 0.94)

Table.22: Association of ED Score with Waist circumference of study population (N=509)

Waist circumference	ED Score		Chi square	P-value
	Present	Absent		
Normal	175 (60.13%)	116 (39.86%)	0.105	0.75
High	128 (58.71%)	90 (41.28%)		
TGC Metabolic				
Low	140 (60.60%)	91 (39.39%)	0.204	0.65
High	163 (58.63%)	115 (41.36%)		
HDL				
High	108 (61.01%)	69 (38.98%)	0.250	0.62
Low	195 (58.73%)	137 (41.26%)		
FBS Metabolic				
Low	266 (60.31%)	175 (39.68%)	0.853	0.36
High	37 (54.41%)	31 (45.58%)		
Metabolic syndrome				
NO	200 (61.91%)	123 (38.08%)	2.097	0.15
Yes	103 (55.37%)	83 (44.62%)		

No statistically significant association was found between erectile dysfunction and individual components of metabolic syndrome in the study population. (P value >0.05). Even the association between the presence of metabolic syndrome and ED was statistically not significant. (Table 22)

Table.23: Association of ED Score with IHD of study population (N=509)

IHD	ED Score		Chi square	P-value
	Present	Absent		
Present	26 (66.66%)	13 (33.33%)	0.893	0.34
Absent	277 (58.93%)	193 (41.06%)		
Retinopathy				
Absent	173 (57.47%)	128 (42.52%)	1.289	0.26
Present	130 (62.5%)	78 (37.5%)		
Neuropathy				
Absent	103 (55.97%)	81 (44.02%)	1.508	0.22
Present	200 (61.53%)	125 (38.46%)		
Nephropathy category				
Absent	292 (58.98%)	203 (41.01%)	2.167	0.14
Present	11 (78.57%)	3 (21.42%)		

No statistically significant association was found between any of the micro or macrovascular complications of diabetes mellitus and the erectile dysfunction in study population (P value > 0.05)

Table.24: Multivariate logistic regression analysis of factors associated with ED

Parameters	Odds ratio (adjusted)	95% C.I. for adjusted odds ratio		P value
		Lower	Upper	
Age Group(base line =Below 40)				
41 to 50	3.611	1.917	6.800	<0.001
51 to 60	9.576	5.121	17.906	<0.001
61 and above	7.602	3.296	17.536	<0.001
HbA1cgroup (base line=Normal)				
poor	3.632	0.850	15.525	0.082
Very poor	5.653	1.463	21.840	0.012

After adjusting for all potential confounders, the odds of ED were 3.61 times (95% CI 1.91 to 6.80) more in 41 to 50 year age group as compared to below 40 year age group, which was statistically significant (P value <0.001). The odds of ED were 9.57 (95% CI 5.12 to 17.90, p value <0.001) times and 7.06 (95% CI 3.29 to 17.53, P value < 0.001) times more in 51 to 60 and above 60 age groups as compared to below 40 years.

After adjusting for all potential confounders, the odds of ED were 3.63 times (95% CI 0.850 to 15.52) more in people with poorglycemic control, as compared to good glycemic control group, which was statistically significant (P value <0.001). The odds were 5.65 (95% CI 1.46 to 21.84, p value 0.012) in with people with very poor glycemic control, as compared to people with good glycemic control.

DISCUSSION

Diabetes has emerged as a major public health problem contributing to enormous morbidity and mortality through various metabolic, microvascular and macrovascular complications. India in recent years has emerged as global leader in the burden of diabetes and considering its huge population the absolute number of diabetes cases in India is highest in India, second only to China.

Even though the healthcare providers in India at different levels are well aware of the majority of the complications related to diabetes mellitus, its association with erectile dysfunction and related impact of psychological health and quality of life is one of the most neglected aspects of diabetes care. The stigma associated with erectile dysfunction, cultural factors in India, where matters related to sexuality are not openly discussed and poor awareness among the patients are also important reasons for gross underreporting and missed diagnosis of erectile dysfunction.

Hence the current study was conducted in tertiary care hospital, to estimate the prevalence and factors associated with erectile dysfunction in patients with diabetes mellitus. In the current study, the mean age was 51.08 ± 9.40 years with an age range of 23 to 80 years. The age range included in the current study is similar to many other studies conducted on the subject. In a study by **Lopez MC et al**⁴⁹ **the age range of diabetic subjects evaluated for ED was** between 21 and 50 years. In a study by **Seid A et al**⁷ the mean age of study participants was slightly lesser than the current study at 43.39 years. These differences in age structure can also be important factors responsible for differences in the prevalence reported by various studies.

Another important demographic factor, which can have strong association with poor awareness and under-reporting of ED, is the educational status of the person. In the current study, 20.63% of the subjects were illiterate, and another 26.92% have studied only up to secondary school level. Only about half (52.46%) of the study population were educated till graduation and beyond. Cultural heterogeneity was another important parameter in the study group. Even though the majority (94.30%) of study participants was Hindus, there was a significant chunk of subjects, who belonged to other religions like Muslims (3.34%) and Christians (2.36%). The way the sexual aspects of health are perceived and discussed may be strongly influenced by the religion and the cultural milieu of the family and community, and there is a strong need for health care providers to keep these aspects in mind while assessing and treating diabetic patients. Not many studies in the literature have evaluated the role of these factors in ED. Also, these parameters cannot be compared with studies conducted in other countries due to inherent differences in the socio-demographic structures of these population groups.

The mean Duration of diabetes mellitus was 9.517 ± 5.743 years in the study population. The minimum Duration was 1 year and the maximum duration was 38 years. Among the study population, only 2.75% had good glyceemic control. The proportion of subjects with poor and very poor glyceemic control was 10.81% and 86.44% respectively. In the study by **Seid A et al**⁷ the mean duration of diagnosed diabetes was 6.22 years, which was slightly lower than the current study. Many studies like **Mazzilli R et al.**⁵³ have documented that duration of diabetes and glyceemic control to be consistently associated with Erectile dysfunction, hence the current study has analyzed these parameters.

In the current study, the overall prevalence of erectile dysfunction was 59.53%. ED was mild in 139 (27.31%), Mild-moderate in 98 (19.25%), Moderate in 27 (5.30%) and Severe in 39 (13.16%) subjects. The mean self-reported duration of ED was 4.719 ± 5.434 , with the duration ranging from recent onset to 30 years. In a study by **Chen S et al**⁵⁸ ED was more prevalent in type 2 diabetic men than that in the control group (58.51% vs. 26.76%, $P < 0.001$). **Rosen RC et al**⁴⁶ in their multicenter Look AHEAD trial has reported a 49.8% prevalence of mild or moderate degrees of ED and 24.8% complete ED which was much higher than the current study. As per a study by **Lopez MC et al**⁴⁹ the prevalence of erectile dysfunction was 55% among diabetic patients. But in this, the authors have used “international index of erectile function (IIEF) to assess ED as compared to modified IIEF I.e IIEF5 used in the current study. **Mutagaywa RK et al**⁵² have reported an overall prevalence of 55.1% (12.8% had mild dysfunction, 11.5% moderate and 27.9% severe dysfunction), which was very close to the prevalence reported by the current study. In a study by **Mazzilli R et al**⁵³ DM was present among 19.5% subjects with ED. The prevalence of subjects affected by DM in a population of men with ED was 19.5% and was the most common risk factor identified. **Seid A et al**⁷ have reported an overall prevalence of erectile dysfunction of 69.9%, with 32.9% suffering from mild, 31.7% moderate, and 5.2% severe erectile dysfunction, which was higher than the prevalence reported by the current study. This study had reported higher prevalence, in spite of the lower mean age and relative shorter mean duration of diabetes, as compared to the current study.

In spite of the differences in the population structure, assessment tools used, the majority of the reviewed studies have documented high prevalence of ED, affecting, more than 50% of the diabetic subjects. This implies every second subject presenting with diabetes is likely to have ED, and health care providers need to have

high index of suspicion and need to evaluate them with any of the available structured assessment methods.

In univariate analysis, the only factors which have shown statistically significant associations were the higher age of the person and poor glycemetic control. These two factors have been strongly associated with ED even after controlling for the effect of each other in multivariate analysis. In multivariate analysis, the odds of ED were 3.61 times (95% CI 1.91 to 6.80) more in 41 to 50 year age group as compared to below 40 year age group, which was statistically significant (P value <0.001). The odds of ED were 9.57 (95% CI 5.12 to 17.90, p value <0.001) times and 7.06 (95% CI 3.29 to 17.53, P value < 0.001) times more in 51 to 60 and above 60 age groups as compared to below 40 years. **Rosen RC et al**⁴⁶ also have reported similar findings. In their study, ED was significantly associated with age (odds ratio [OR] = 1.05; confidence interval [CI]: 1.01-1.10) and baseline HbA1c (OR = 1.31; CI: 1.05-1.63), but the strength of association reported by them was much lower than the current study. In a study by **Mutagaywa RK et al**⁵² also ED was significantly predicted by old age (odds ratio (OR) = 7.1, 95% CI 1.2-40.7), along with few other factors. In a study by **Seid A et al**⁷ also multivariate logistic regression revealed that erectile dysfunction was significantly predicted by old age (Adjusted Odds Ratio [AOR] =15.013, CI:3.212-70.166), longer duration of diabetes (AOR = 3.77, CI:1.291-11.051), as in the current study. The current study also has not demonstrated any significant association between duration of diabetes and ED, in contrast to the above-mentioned study. **Mutagaywa RK et al**¹ also have reported only a marginal association of ED with longer duration of DM (p=0.056), as in the current study. But there some authors have questioned the inclusion of the age and duration of diabetes in the multivariate analysis, citing strong multicollinearity between these two factors

and concluded age being more relevant and strong risk factor than the duration of diabetes.

In the current study, after adjusting for all potential confounders, the odds of ED were 3.63 times (95% CI 0.850 to 15.52) more in people with poor glycemic control, as compared to good glycemic control group, which was statistically significant (P value <0.001). The odds were 5.65 (95% CI 1.46 to 21.84, p value 0.012) in with people with very poor glycemic control, as compared to people with good glycemic control. **The Look AHEAD trial (Action for Health in Diabetes)**⁴⁶ has also demonstrated significant association between ED and baseline HbA1c (OR = 1.31; CI: 1.05-1.63). In a study by **Lopez MC et al**⁴⁹ also poor glycemic control was positively associated with higher risk of ED with odds of 5.5 (2.3 to 81) in this study. Even though the HbA1C level is consistently reported to have been associated with ED, the strength of association reported by various studies is highly variable.

The other demographic factors like education, religion, number of children etc. had no statistically significant association with erectile dysfunction in the study. Substance abuse like alcoholism and smoking etc. has shown no significant association with erectile dysfunction in the study. Presence of other co-morbidities like obesity, hypercholesterolemia, hypertension metabolic syndrome etc. was also not associated with ED in the current study. Even the presence of other micro or macrovascular complication had no association with ED in the current study. The Look AHEAD trial(Action for Health in Diabetes)⁴⁶ have reported a strong association of ED with metabolic syndrome (OR = 3.05, CI: 1.31-7.11). In a study by **Cancer S et al**⁵⁰ diabetic polyneuropathy was the only factor reported to be associated with higher likelihood (93.3% in the presence and 60.0% in the absence of neuropathy) and

severity (43.3% in the presence and 14.3% in the absence of neuropathy) of ED in this study. **Mutagaywa RK et al**¹ have reported ED was significantly predicted by evidence of peripheral neuropathy (OR) =5.9, 95% CI 1.6-21.3), and evidence of peripheral vascular disease (OR =2.5, 95% CI 1.2-5.3) along with age and duration of DM. But similar to the current study, in the study by **Seid A et al**⁷ also multivariate logistic regression revealed no association of ED with body mass index, co-morbidity, glycemic control, and alcohol consumption.

Hence it can be concluded that there is no consistency across the studies, in terms the association between ED and co-morbidities and complications. None of the co-morbidities or diabetes-related microvascular complication had been shown to be uniformly assorted with ED. Even when the positive association is reported, the strength of association is quite variable.

Rutte A et al (2015) have conducted a study, aimed to assess the prevalence and correlates of sexual dysfunction in a sample of Dutch men and women with type 2 diabetes. In this study, on the basis of predefined criteria, 69% of men and 70% of women were classified with some degree of sexual dysfunction. Univariable logistic regression analyses revealed that sexual dysfunctions were associated with higher age, clinical depression (Centre for Epidemiological Studies score ≥ 16), and one or more diabetes-related complications in both men and women. Multivariable logistic regression analyses revealed that clinical depression was most strongly associated with both male (OR = 6.87, 95% CI [1.77, 26.63]) and female (OR = 9.33, 95% CI [1.03, 84.87]) sexual dysfunction. The authors have emphasized the need to screen and manage sexual dysfunction in diabetes patients.⁵⁴

The other important issues that are highlighted by some of the studies are gross underreporting and underdiagnosis of ED among diabetic population. **Seid A et al**⁷ **have reported that** 97% of ED patients identified in their study are newly diagnosed and were never screened before during their routine care. **Malavige LS et al**⁵¹ emphasized on the strong impact of ED on emotional life, and huge negative psychological Impact of Erectile Dysfunction in the diabetic population. Apart from the quality of life Yamada T et al,⁴⁸ in a large scale meta-analysis have also reported a strong association between erectile dysfunction and cardiovascular events in diabetic men and suggested ED may be considered as an early marker of future cardiovascular events.

Considering the huge negative impact of ED on various physical and psychological aspects of diabetic patients and recent reports of its role as an early marker of future complications, it is extremely vital to diagnose ED and address it early in the course of illness. Considering the extremely high prevalence, even universal screening will be a worthwhile exercise to include in routine clinical care. There is an immediate need to sensitize health care practitioners at all levels on the subject.

CONCLUSION

1. There was high prevalence of erectile dysfunction among diabetes mellitus patients as more than half of them (59.3%) have been found to have erectile dysfunction of different degrees.
2. The prevalence of mild and mild-moderate ED was 27.31% and 19.25% in the study population. The proportion of subjects with Moderate and severe ED was 5.30% and 13.16%.
3. In univariate analysis, among the socio demographic factors higher age of the individual was strongly associated with ED in the study population. Other demographic variables like educational status, number of children were not associated with ED.
4. Among the Co-morbidities assessed like higher waist circumference, high LDL, Low HDL and hypertension etc had shown no association with ED. The presence of metabolic syndrome also had shown no association with ED in univariate analysis.
5. Among the other relevant diseases, the effect of thyroid dysfunction was assessed and had shown no statistically significant association with ED in univariate analysis.
6. Presence of any of the micro or macrovascular complications of diabetes mellitus like IHD, Nephropathy, and retinopathy were not associated with higher prevalence of ED in study population
7. The other factor, which has shown strong positive association with ED in univariate analysis, was poor glycemic control, as assessed by HbA1C levels. The proportion of ED was higher in people with higher HbA1C levels.

8. In multivariate analysis, the factors associated with ED were higher age of Individual and poor glyceimic control, even after controlling for the effect of potential confounders
9. The factor which had shown strongest association with ED was person's age between 51 to 60 years, followed by age above 60 years and very poor glyceimic control.

LIMITATIONS:

1. The key limitation of the study is selection of study subjects by non-random sampling, as per the convenience. This would have introduced some element of selection bias, the direction, and magnitude of which is difficult to estimate.
2. The generalizability of study findings is limited, as the study is conducted in a single tertiary care hospital, with limited catchment area

RECOMMENDATIONS:

1. There is a need to carry out further large-scale multicenter studies on the subject, to understand the strong risk factors for ED among diabetic population
2. There is need to assess the impact of erectile dysfunction on psychological health, quality of life of an individual.
3. There is need to educate the treating clinicians at all levels of high burden of ED among the diabetic population and train them to evaluate and manage it effectively to prevent its adverse psychological impact.
4. Appropriate interventions need to be tested by randomized controlled trials to find out evidence based interventions to mane ED in diabetic patients.

SUMMARY

Considering the high prevalence and lack of enough focus on erectile dysfunction among diabetic population in India, this cross sectional study was undertaken in a tertiary care teaching hospital. The objectives of the study were to assess the prevalence, severity and factors associated with erectile dysfunction among 509 Type II Diabetes mellitus patients, using International Index of Erectile Function (IIEF-5) Questionnaire. The prevalence of ED was 59.3%. The severity was mild and mild-moderate in 27.31% and 19.25%, Moderate in 5.3% and severe in 13.16% of the population. Higher age of the person and poor glycaemic control are strongly associated with ED. None of the other factors had any independent association with ED. The study highlights the importance of active screening of all the diabetic population with appropriate tools for ED and effective management of the condition.

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ANNEXURE-I

**PATIENT INFORMATION SHEET AND INFORMED WRITTEN CONSENT
FROM**

CONSENT FOR PARTICIPATION IN RESEARCH STUDY

Mr _____ we are requesting you to enrol yourself in study titled “**Study of Erectile Dysfunction In A Diabetic Population - A one year cross sectional study at KLE’s Dr. Prabhakar Kore Hospital** conducted by Dr. _____, Post Graduate in M.D. General Medicine under the guidance of Dr. _____, Professor, Department General Medicine, J.N. Medical College, KLE university, Belgaum.

Respected Sir we request you to participate in our study as you are eligible for participating in the study.

Your participation in research is voluntary. Your decision whether or not to participate in the study will not affect your relationship with J.N. Medical College. If you decide to participate you are free to withdraw at any time.

The purpose of research is to study erectile dysfunction in a diabetic population.

Procedure Involved:

If you agree to enrol yourself in my study, you will be interviewed and asked questions as per the International Index of Erectile Function questionnaire. You will also be asked regarding your present, past and family history, then you will be clinically examined in detail and investigated accordingly.

Voluntary Participation/Withdrawal:

Taking part in the study is voluntary. You may choose not to enroll yourself in this study. Your decision will not change present or future health care services offered to you at K.L.E's hospital.

Privacy and Confidentiality:

The only people to know that you are a research subject are members of the research team. No information about you or information provided by you during the research will be disclosed to other without your written permission except:

1. In emergency to protect your rights and welfare.
2. If required by law.

Authorization to Publish Results:

When the results of the research are published or discussed, in a conference, no information will be displayed that would disclose your identity. Any information that is obtained in connection with this study, that can be identified with you will remain confidential.

Financial Incentives for participation:

No financial incentives are being offered to enrolled patients. It is purely being done with the idea of research and all the cost of the study will be borne by the investigator.

CONSENT STATEMENT

I, the undersigned, have been explained in my own vernacular language about the study and my participation in the study is voluntary. If I want I can withdraw at any time. Also I have been given enough time to clear my doubts about the study and my rights as a study participant.

In case you have any questions related to the study you can contact Dr. _____

In case you have any questions about your rights as a study participant you can contact Dr. _____

Signature or the left thumb impression of the participant or legally authorized representative.

Participant's name: _____ Signature: _____

Witness name: _____ Signature: _____

Experimenter's name: _____ Signature: _____

Place: _____

Date: _____

ANNEXURE II – PROFORMA

KLE HOSPITAL AND MRC

ERECTILE DYSFUNCTION IN DIABETICS QUESTIONNAIRE

NAME: _____

DATE

ADDRESS: _____ **REG.:** _____

AGE: _____ OCCUPATION: _____ EDUCATION: _____

HEIGHT: _____ WEIGHT: _____ BMI (kg/m²): _____

RELIGION: _____ MARRIED LIFE: _____ CHILDREN:

PATIENT HISTORY

**PAST MEDICAL HISTORY: / RISK FACTORS FOR ERECTILE
DYSFUNCTION**

DM HTN IHD CHOLESTEROL TRAUMA

NEUROPATHY NEPHROPATHY RETINOPATHY

DURATION OF DM : _____

Which treatment method are you using to control your sugar? (Circle one)

Diet

Pills

Exercise

Insulin

PRESENT SEXUAL FUNCTION: THE IIEF-5 Questionnaire (SHIM)

Please encircle the response that best describes you for the following five questions:

Over the past 6 months:

1. How do you rate your confidence that you could get and keep an erection?

- | | |
|-----------|---|
| Very low | 1 |
| Low | 2 |
| Moderate | 3 |
| High | 4 |
| Very high | 5 |

2. When you had erections with sexual stimulation, how often were your erections hard enough for penetration?

- | | |
|--|---|
| Almost never or never | 1 |
| A few times (much less than half the time) | 2 |
| Sometimes (about half the time) | 3 |
| Most times (much more than half the time) | 4 |
| Almost always or always | 5 |

3. During sexual intercourse, how often were you able to maintain your erection after you had penetrated your partner?

- | | |
|--|---|
| Almost never or never | 1 |
| A few times (much less than half the time) | 2 |
| Sometimes (about half the time) | 3 |
| Most times (much more than half the time) | 4 |
| Almost always or always | 5 |

4. During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse?

- | | |
|---------------------|---|
| Extremely Difficult | 1 |
| Very difficult | 2 |
| Difficult | 3 |
| Slightly difficult | 4 |
| Not difficult | 5 |

5. When you attempted sexual intercourse, how often was it satisfactory for you?

- | | |
|--|---|
| Almost never or never | 1 |
| A few times (much less than half the time) | 2 |
| Sometimes (about half the time) | 3 |
| Most times (much more than half the time) | 4 |
| Almost always or always | 5 |

Total Score: _____

1-7: Severe ED 8-11: Moderate ED 12-16: Mild-moderate ED 17-21: Mild ED 22-25:

No ED

FAMILY HISTORY:

Diabetes (Y/N): _____

INVESTIGATIONS:

BP (mmHg): _____

FBS (mg/dL): _____

PPBS (mg/dL): _____

HbA1c (%): _____

T4: _____

TSH: _____

TC (mg/dL): _____

HDL (mg/dL): _____ LDL

(mg/dL): _____

TG (mg/dL): _____

Serum Creatinine (mg/dL): _____ Serum

urea: _____

Diagnosis: _____

ANNEXURE III – KEY TO MASTER CHART

+ — Present

- — Absent

DM — Diabetes Mellitus

ED — Erectile Dysfunction

BMI — Body Mass Index

HTN — Hypertension

IHD — Ischaemic Heart Disease

FBS — Fasting Blood Sugar

PPBS — Post Prandial Blood Sugar

HbA1C — Glycosylated Haemoglobin

HDL — High Density Lipoprotein

LDL — Low Density Lipoprotein

TGC — Triglycerides

REG NO	AGE	DURATION OF MARRIED LIFE (YEARS)			CHILDREN	DM DURATION(YEARS)	SELF REPORTED ED DURATION(YEARS)	HEIGHT IN CM2	BMI	RELIGION	HTN	IHD	HYPERCHOLESTOLEMIA	RETINOPATHY	NEUROPATHY	NEPHROPATHY	TRAUMA	SMOKER(Years)	ALCOHOL(Years)	TOBACCO(Years)	DESIRE	EARLYMORNINGERECTIONS	CONFIDENCE	ERECTION	MAINTAIN	DIFFICULTY	SATISFACTION	SCORE	FBS	PPBS	HbA1c	TOTALCHOLESTROL	HDL	LDL	TGC	CREATININE(mg/dl)	UREA(mg/dl)	FAMILY HISTORY OF DM
11,601	60	38	2	9	11	158.0	27.24	HINDU	7	-	-	-	+	-	-	-	50	-	20	+	3.0	3.0	3.0	3.0	3.0	4.0	16.0	138.0	230.0	6.9	208	37	132	192	1	27	-	
4,571	53	28	1	12	8	170.0	20.90	HINDU	5	-	-	-	+	-	-	-	15	-	20	+	3.0	4.0	4.0	4.0	3.0	5.0	20.0	138.0	222.0	7.5	157	29	113	75	1	20	MOTHER	
9,162	63	35	3	3	10	162.0	24.16	HINDU	12	-	-	-	-	-	-	-	-	-	25	+	2.0	5.0	4.0	3.0	2.0	3.0	17.0	91.0	178.0	7.8	160	27	111	115	1	23	-	
2,917,605	67	40	3	13	11	164.0	22.83	HINDU	-	-	-	+	-	-	-	-	37	33	30	+	2.0	3.0	3.0	4.0	4.0	3.0	17.0	356.0	415.0	11.5	147	28	113	160	1	30	MOTHER	
14,000	67	41	2	10	9	158.0	27.12	HINDU	10	+	-	-	-	-	-	-	-	-	30	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	101.0	99.0	8.1	121	28	147	232	1	26	-	
14,335	65	38	6	5	12	162.0	25.53	HINDU	20	-	-	-	-	-	-	-	35	35	35	+	2.0	5.0	4.0	5.0	5.0	5.0	24.0	67.0	191.0	11.7	130	28	95	130	1	20	-	
13,061	53	18	2	5	4	161.0	28.90	HINDU	-	+	-	-	-	-	-	-	30	30	35	+	3.0	5.0	5.0	4.0	4.0	4.0	22.0	145.0	166.0	7.9	294	41	176	384	1	24	-	
5,812	59	45	5	10	0	170.0	30.45	HINDU	-	+	-	-	-	-	-	-	45	40	35	+	2.0	5.0	5.0	5.0	5.0	5.0	25.0	189.0	373.0	9.6	212	32	148	158	1	29	-	
14,335	60	40	4	6	0	162.0	24.39	HINDU	-	-	-	-	-	-	-	-	-	-	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	159.0	347.0	10.0	187	36	110	204	1	30	FATHER	
14,369	36	10	3	1	0	169.0	25.59	HINDU	-	-	-	-	-	-	-	-	-	-	-	+	2.0	4.0	5.0	5.0	4.0	5.0	23.0	223.0	312.0	9.4	200	32	150	200	1	34	-	
527	67	35	2	20	15	170.0	31.63	MUSLIM	-	-	-	-	-	-	-	-	-	-	-	+	2.0	3.0	2.0	2.0	2.0	2.0	11.0	253.0	117.0	11.5	211	40	90	250	2	27	FATHER	
13,511	67	50	-	2	0	160.0	24.69	HINDU	-	+	-	-	-	-	-	-	-	-	15	-	+	3.0	4.0	5.0	5.0	5.0	5.0	24.0	107.0	175.0	7.0	139	40	175	175	1	30	-
11,875	68	45	3	9	5	156.0	30.78	HINDU	6	+	-	-	-	-	+	-	-	-	15	-	+	2.0	2.0	3.0	4.0	5.0	4.0	18.0	215.0	286.0	10.4	130	26	74	147	1	26	MOTHER
6,669	63	40	3	10	10	160.0	25.39	HINDU	1	-	-	-	-	-	-	-	15	15	-	+	2.0	3.0	3.0	2.0	4.0	3.0	15.0	137.0	122.0	7.1	139	40	175	175	1	20	FATHER	
6,336	40	11	2	10	0	162.0	25.15	HINDU	-	-	-	-	-	-	-	-	-	-	15	-	+	2.0	5.0	5.0	4.0	5.0	5.0	24.0	128.0	160.0	8.2	169	26	114	180	1	24	-
14,372	44	22	4	1	0	166.0	24.82	HINDU	-	-	+	-	-	-	-	-	20	20	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	196.0	325.0	10.4	178	55	108	71	1	29	-	
12,677	42	25	2	1	0	156.0	24.70	HINDU	-	-	-	-	-	-	-	-	0	5	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	107.0	137.0	5.9	164	43	100	108	1	30	-	
14,190	47	15	2	8	5	152.0	17.49	HINDU	-	-	-	-	-	-	-	-	-	-	-	+	3.0	3.0	4.0	4.0	4.0	5.0	20.0	100.0	200.0	12.8	189	36	131	107	1	28	-	
14,375	43	17	2	1	0	169.0	22.93	SC	-	-	-	-	-	-	-	-	-	-	8	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	108.0	159.0	7.1	210	34	139	181	1	35	MOTHER
10,424	62	35	4	11	0	159.0	31.84	HINDU	-	-	-	-	-	-	-	-	-	-	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	110.0	121.0	6.6	178	55	108	71	1	30	-	
6,409	60	33	4	10	0	170.0	24.91	MUSLIM	5	-	-	-	+	-	-	-	-	-	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	94.0	100.0	6.8	123	67	41	73	1	26	-	
6,915	68	47	3	15	7	173.0	29.34	HINDU	-	-	-	-	-	-	-	-	5	-	-	+	3.0	4.0	4.0	4.0	4.0	5.0	21.0	94.0	140.0	9.5	201	147	41	66	1	20	-	
14,376	35	6	2	4	0	171.0	24.08	HINDU	6	-	-	-	-	-	-	-	-	-	-	+	2.0	5.0	5.0	5.0	5.0	4.0	24.0	137.0	227.0	6.6	160	34	96	134	1	24	FATHER	
13,708	68	30	2	6	2	173.0	25.06	HINDU	4	+	-	-	+	-	-	-	-	-	-	+	3.0	3.0	3.0	4.0	3.0	5.0	18.0	123.0	171.0	8.5	189	147	41	205	1	29	-	
586	50	28	2	20	0	169.0	24.40	MUSLIM	-	-	-	-	-	-	-	-	-	-	-	+	3.0	5.0	5.0	5.0	4.0	5.0	24.0	120.0	175.0	9.0	213	47	149	106	1	30	-	
2,672	52	29	3	13	10	180.0	28.21	HINDU	-	-	-	-	-	-	-	-	-	15	-	+	3.0	5.0	4.0	3.0	4.0	4.0	20.0	157.0	164.0	7.3	112	28	52	159	1	28	FATHER	
7,390	55	29	2	19	0	166.0	24.02	HINDU	-	-	-	-	-	-	-	-	20	20	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	132.0	208.0	7.9	149	57	86	31	1	35	-	
14,258	43	20	2	4	0	176.0	31.48	HINDU	-	-	-	-	-	-	-	-	-	-	-	+	3.0	5.0	5.0	4.0	5.0	5.0	24.0	136.0	224.0	10.0	234	25	170	195	1	23	-	
4,275	80	60	4	20	30	164.0	22.98	HINDU	8	-	-	-	-	-	-	-	-	-	-	-	2.0	1.0	1.0	1.0	1.0	1.0	5.0	114.0	150.0	7.0	178	39	122	88	1	24	-	
11,061	70	45	3	3	0	164.0	23.05	HINDU	-	-	-	-	-	-	-	-	-	-	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	127.0	183.0	7.5	201	147	41	66	1	27	MOTHER	
14,211	66	37	3	20	0	168.0	24.80	HINDU	22	-	-	-	-	-	-	-	-	-	25	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	205.0	217.0	8.9	128	38	51	194	1	25	-
14,240	64	35	2	20	0	168.0	24.80	CHRISTIAN	-	-	-	-	-	-	-	-	-	-	25	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	163.0	214.0	9.0	158	34	91	135	1	29	-
12,620	57	34	6	2	0	155.0	31.63	HINDU	-	-	-	-	-	-	-	-	-	-	-	+	2.0	5.0	5.0	5.0	5.0	5.0	25.0	110.0	185.0	7.4	187	30	140	83	1	31	FATHER	
13,406	72	45	2	30	25	168.0	22.46	HINDU	10	-	+	-	-	-	-	-	-	-	-	+	3.0	5.0	4.0	4.0	4.0	4.0	21.0	119.0	229.0	9.0	271	26	187	281	2	23	MOTHER	
14,380	42	12	2	3	0	161.0	30.67	HINDU	3	-	-	-	-	-	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	259.0	328.0	9.7	195	29	73	59	1	20	MOTHER	
9,763	55	30	2	10	0	174.0	29.40	HINDU	4	-	-	-	-	-	-	-	-	-	20	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	120.0	190.0	7.2	181	40	99	124	1	26	GRANDMA
12,881	59	33	3	15	0	160.0	25.47	HINDU	-	+	-	-	-	-	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	219.0	339.0	9.1	195	29	73	59	1	30	-	
9,567	54	25	2	17	0	172.0	30.08	HINDU	1	-	-	-	-	-	-	-	20	20	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	118.0	200.0	7.3	143	37	94	179	1	24	FATHER	
14,381	23	-	-	2	0	159.0	21.56	HINDU	2	-	-	-	-	-	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	93.0	170.0	6.3	229	60	130	194	1	22	-	
6,478	50	25	2	8	5	166.0	39.01	HINDU	8	-	-	-	-	-	-	-	15	15	20	+	2.0	2.0	3.0	2.0	1.0	10.0	259.0	328.0	9.7	195	29	73	59	1	28	MOTHER/BROTHER		
11,738	51	15	2	5	0	161.0	22.76	HIH DU	-	-	-	+	-	-	-	-	-	20	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	130.0	230.0	11.6	116	31	66	93	1	27	MOTHER	
14,231	40	14	2	8	0	156.0	24.37	HINDU	-	-	-	-	-	-	-	-	-	-	12	15	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	206.0	254.0	7.8	107	43	51	67	1	24	-

14,135	65	38	3	12	0	167.0	26.78	HINDU	12	-	-	-	-	-	-	35	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	85.0	173.0	6.7	162	43	103	83	1	21	FATHER	
6,897	60	34	3	8	0	165.0	32.10	HINDU	-	-	-	+	-	-	-	15	30	35	+	3.0	5.0	5.0	5.0	4.0	5.0	24.0	114.0	126.0	11.1	121	28	147	232	1	19	FATHER
14,395	53	25	2	5	0	170.0	23.49	HINDU	-	-	-	+	+	-	-	-	20	30	+	2.0	5.0	4.0	4.0	4.0	5.0	22.0	268.0	456.0	10.2	269	19	195	128	1	18	MOTHER
11,042	63	39	4	12	0	168.0	26.08	HINDU	-	+	-	-	+	-	-	-	-	-	+	2.0	5.0	5.0	4.0	5.0	5.0	24.0	227.0	314.0	11.1	208	37	132	192	1	27	UNCLE
13,292	38	14	2	2	2	186.0	21.39	HINDU	-	-	-	-	-	-	-	-	15	15	+	2.0	3.0	4.0	3.0	4.0	5.0	19.0	100.0	147.0	9.7	157	29	113	75	1	20	-
12,937	56	30	4	4	5	169.0	23.46	HINDU	4	-	-	+	+	-	-	-	12	12	+	2.0	4.0	4.0	4.0	4.0	5.0	21.0	130.0	146.0	6.9	160	27	111	115	1	23	-
14,412	57	26	2	1	0	155.0	22.14	HINDU	1	-	+	-	+	-	+	30	30	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	133.0	240.0	8.3	147	28	113	160	1	30	-
9,448	56	25	2	5	0	182.0	22.34	HINDU	-	-	+	-	+	-	-	-	-	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	113.0	141.0	7.3	121	28	147	232	1	26	MOTHER/BROTHER
10,903	56	35	4	20	15	163.0	19.57	HINDU	-	-	+	+	+	-	-	30	30	30	+	2.0	4.0	5.0	4.0	4.0	4.0	21.0	201.0	276.0	12.6	130	28	95	130	1	20	-
16,486	26	2	2	4	0	163.0	22.58	HINDU	-	-	-	-	-	-	-	-	-	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	195.0	372.0	11.6	294	41	176	384	1	24	MOTHER
13,860	43	18	3	5	0	162.0	26.63	HINDU	-	-	+	+	+	-	-	20	20	20	+	3.0	3.0	4.0	5.0	5.0	5.0	22.0	165.0	285.0	9.6	212	32	148	158	1	29	MOTHER
9,097	39	11	2	7	0	156.0	26.87	HINDU	5	+	-	+	-	-	-	-	5	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	157.0	272.0	8.7	187	36	110	204	1	30	-
89,800	38	6	2	5	0	163.0	24.46	HINDU	5	-	-	+	-	-	-	5	11	-	+	3.0	5.0	5.0	4.0	5.0	5.0	24.0	76.0	104.0	5.6	183	32	132	95	1	28	MOTHER
2,282	64	38	2	20	15	170.0	24.22	CHRISTIAN	10	-	-	+	+	-	-	-	35	-	+	2.0	2.0	3.0	3.0	3.0	2.0	13.0	287.0	266.0	9.3	156	42	45	428	1	35	FATHER
13,309	36	9	1	1	1	167.0	19.90	HINDU	-	-	-	+	+	-	-	6	6	6	+	3.0	3.0	3.0	3.0	3.0	3.0	15.0	414.0	400.0	13.3	212	32	148	158	1	40	BROTHER
9,521	60	35	2	5	8	176.0	22.73	HINDU	6	-	-	+	+	-	-	20	20	15	+	3.0	4.0	4.0	3.0	3.0	3.0	17.0	151.0	211.0	6.7	172	35	115	108	1	32	MOTHER
13,389	39	25	2	5	3	165.0	21.89	HINDU	-	-	+	-	-	-	-	-	10	-	+	3.0	4.0	4.0	4.0	4.0	5.0	21.0	247.0	410.0	10.9	223	33	160	160	1	32	MOTHER
14,076	48	-	-	13	4	161.0	27.16	HINDU	6	-	+	+	-	-	-	10	10	10	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	104.0	86.0	6.3	151	29	105	82	1	30	MOTHER/ FATHER
14,323	51	30	3	4	5	165.0	26.26	HINDU	1	-	+	-	+	-	-	30	10	30	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	165.0	245.0	8.4	222	45	141	178	1	27	UNCLE
5,335	57	30	2	10	6	165.0	22.04	HINDU	-	-	+	+	+	-	-	-	15	-	+	2.0	1.0	1.0	1.0	1.0	1.0	5.0	285.0	295.0	8.7	161	32	110	97	1	32	-
14,159	38	15	2	6	0	168.0	20.80	HINDU	-	-	-	-	-	-	-	-	-	20	+	2.0	5.0	5.0	5.0	5.0	5.0	25.0	267.0	366.0	14.8	205	35	139	150	1	28	MOTHER
9,984	48	23	3	6	5	173.0	27.30	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	97.0	132.0	8.9	255	32	150	367	1	23	-
16,382	54	25	2	1	2	166.0	22.86	HINDU	-	-	+	+	+	-	-	20	20	20	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	94.0	163.0	7.4	138	22	70	232	1	30	FATHER/MOTHER
14,598	40	13	2	3	2	159.0	24.21	HINDU	-	-	+	-	-	-	-	-	-	-	+	2.0	4.0	3.0	4.0	4.0	4.0	19.0	190.0	276.0	10.7	255	32	150	367	1	26	-
14,132	45	15	2	1	0	181.0	23.66	HINDU	13	-	+	-	-	-	-	15	15	-	+	3.0	4.0	5.0	5.0	5.0	4.0	23.0	147.0	180.0	8.3	269	19	195	128	-	20	-
14,244	50	26	2	7	5	159.0	24.21	HINDU	-	-	+	-	-	-	-	-	-	-	+	3.0	4.0	3.0	4.0	4.0	4.0	19.0	190.0	276.0	10.7	255	32	150	367	1	24	-
10,387	59	32	2	9	8	181.0	23.66	HINDU	13	-	+	-	-	-	-	15	15	-	+	2.0	2.0	2.0	2.0	2.0	2.0	10.0	147.0	180.0	8.3	269	19	195	128	-	29	-
10,686	49	6	2	9	5	163.0	24.46	HINDU	5	-	-	+	-	-	-	5	11	-	+	3.0	5.0	5.0	3.0	3.0	4.0	20.0	76.0	104.0	5.6	183	32	132	95	1	28	FATHER
14,278	56	30	2	20	11	170.0	24.22	HINDU	10	-	-	+	+	-	-	-	35	-	+	2.0	2.0	3.0	3.0	3.0	3.0	13.0	287.0	266.0	9.3	156	42	45	428	1	35	FATHER
9,207	45	10	2	6	5	167.0	19.90	HINDU	-	-	-	+	+	-	-	6	6	6	+	3.0	3.0	3.0	3.0	3.0	3.0	15.0	414.0	400.0	13.3	151	29	105	82	1	40	MOTHER
8,900	56	30	2	5	6	176.0	22.73	HINDU	6	-	-	+	+	-	-	20	20	15	+	3.0	4.0	4.0	3.0	3.0	3.0	17.0	151.0	211.0	6.7	172	35	115	108	1	32	UNCLE
8,089	39	25	2	5	2	165.0	21.89	HINDU	-	-	+	-	-	-	-	10	-	+	3.0	4.0	4.0	4.0	4.0	5.0	21.0	247.0	410.0	10.9	223	33	160	160	1	32	-	
10,946	51	20	1	13	6	161.0	27.16	HINDU	6	-	+	+	-	-	-	10	10	10	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	104.0	86.0	6.3	151	29	105	82	1	30	-
11,729	55	30	3	7	6	165.0	26.26	HINDU	1	-	+	-	+	-	-	30	10	30	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	165.0	245.0	8.4	222	45	141	178	1	27	-
14,369	57	30	2	10	7	165.0	22.04	HINDU	-	-	+	+	+	-	-	-	15	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	285.0	295.0	8.7	161	32	110	97	1	32	MOTHER/BROTHER
14,399	38	15	2	6	0	168.0	20.80	HINDU	-	-	-	-	-	-	-	-	-	20	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	267.0	366.0	14.8	205	35	139	150	1	28	-
14,034	46	23	3	6	3	173.0	27.30	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	97.0	132.0	8.9	183	32	132	95	1	21	MOTHER
13,925	50	25	2	1	5	166.0	22.86	HINDU	-	-	+	+	+	-	-	20	20	20	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	94.0	163.0	7.4	138	22	70	232	1	14	MOTHER
13,292	40	13	2	6	4	159.0	24.21	HINDU	-	-	+	-	-	-	-	-	-	-	+	2.0	4.0	3.0	4.0	4.0	4.0	19.0	190.0	276.0	10.7	255	32	150	367	1	18	-
10,434	50	28	2	6	5	181.0	23.66	HINDU	13	-	+	-	-	-	-	15	15	-	+	2.0	2.0	2.0	2.0	2.0	2.0	10.0	147.0	180.0	8.3	269	19	195	128	1	22	MOTHER
14,440	43	12	2	6	3	176.0	26.44	CHRISTIAN	-	-	-	-	-	-	-	23	20	20	+	3.0	4.0	4.0	5.0	4.0	4.0	21.0	179.0	200.0	7.9	160	40	80	118	1	22	FATHER
14,446	60	32	3	5	5	158.0	21.27	HINDU	-	+	+	-	+	-	-	-	-	-	+	1.0	2.0	2.0	2.0	3.0	2.0	11.0	90.0	180.0	9.4	168	114	113	33	1	25	BROTHER
13,774	56	32	2	8	5	163.0	29.47	HINDU	-	-	-	+	+	-	-	40	30	40	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	265.0	442.0	11.6	200	33	138	147	1	36	MOTHER
12,912	43	12	2	10	0	170.0	31.35	HINDU	-	-	+	+	+	-	-	20	12	20	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	117.0	179.0	6.2	175	22	118	175	1	20	MOTHER
14,216	38	10	-	3	5	168.0	30.65	HINDU	-	+	+	+	-	-	-	10	10	15	+	2.0	3.0	3.0	3.0	3.0	3.0	15.0	145.0	245.0	12.0	90	48	38	42	1	24	MOTHER/ FATHER
13,717	49	21	2	1	4	156.0	22.85	HINDU	-	-	+	-	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	267.0	366.0	14.8	205	35	139	150	1	21	UNCLE
12,696																																				

14,554	65	35	3	21	15	160.0	26.17	CHRISTIAN	10	-	+	+	+	-	-	38	38	-	+	2.0	2.0	3.0	2.0	3.0	2.0	12.0	143.0	160.0	7.0	290	32	87	278	1	29	-
13,456	54	32	2	6	5	165.0	23.58	HINDU	3	-	-	-	-	-	-	-	-	-	+	3.0	2.0	3.0	3.0	3.0	2.0	13.0	147.0	190.0	6.7	165	32	90	180	1	20	FATHER
12,345	50	24	2	6	5	173.0	24.73	CHRISTIAN	-	-	-	-	-	-	-	10	5	15	+	3.0	4.0	3.0	2.0	3.0	2.0	14.0	243.0	323.0	10.9	202	47	128	136	1	24	MOTHER
13,456	54	15	1	6	5	165.0	26.81	HINDU	-	-	-	-	-	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	184.0	364.0	10.4	202	36	123	215	1	14	FATHER/MOTHER
14,557	60	35	3	10	12	161.0	23.65	HINDU	10	+	+	+	-	-	-	-	-	-	+	3.0	3.0	4.0	2.0	3.0	3.0	15.0	148.0	174.0	6.9	124	35	70	94	2	50	MOTHER
14,560	45	25	2	2	0	163.0	25.14	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	5.0	5.0	5.0	5.0	5.0	25.0	196.0	242.0	10.8	135	28	98	47	1	37	MOTHER
14,561	63	30	1	4	8	171.0	16.07	HINDU	-	-	-	+	-	-	-	30	-	30	+	3.0	3.0	2.0	3.0	3.0	2.0	13.0	92.0	150.0	5.8	130	27	100	150	1	24	MOTHER
14,563	42	15	2	2	2	173.0	21.95	HINDU	-	-	-	-	+	-	-	-	20	-	+	4.0	4.0	4.0	4.0	4.0	4.0	20.0	115.0	83.0	6.3	201	54	120	136	1	20	MOTHER/FATHER
14,565	62	30	4	6	7	167.0	18.65	HINDU	-	-	+	-	-	-	-	-	-	-	+	3.0	3.0	3.0	2.0	3.0	3.0	14.0	230.0	370.0	9.8	150	39	64	215	1	25	MOTHER
14,571	58	30	4	30	10	158.0	22.91	HINDU	-	-	-	-	-	-	-	20	-	25	+	3.0	4.0	3.0	2.0	3.0	3.0	15.0	222.0	272.0	13.1	132	30	20	150	1	32	FATHER
14,572	48	18	2	5	5	173.0	23.02	HINDU	-	-	-	-	-	-	-	20	20	-	2.0	3.0	4.0	4.0	3.0	3.0	17.0	103.0	252.0	6.2	132	28	98	150	1	35	FATHER	
14,574	49	20	1	15	0	164.0	27.14	HINDU	-	-	-	-	-	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	133.0	228.0	8.6	135	32	89	156	1	19	-
14,576	28	3	1	18	10	173.0	23.05	HINDU	-	-	+	-	-	-	-	5	-	+	4.0	3.0	3.0	4.0	3.0	3.0	16.0	295.0	452.0	15.3	241	29	58	1,245	1	21	FATHER MOTHER	
14,579	56	36	2	17	9	160.0	27.46	HINDU	7	+	+	-	+	-	-	-	-	-	+	1.0	2.0	3.0	2.0	1.0	2.0	10.0	136.0	246.0	9.0	192	40	160	300	1	34	-
14,580	59	39	2	5	4	158.0	21.63	CHRISTIAN	-	-	+	+	+	-	-	-	25	-	+	1.0	2.0	2.0	2.0	2.0	2.0	10.0	138.0	181.0	6.6	270	40	96	163	1	32	MOTHER
14,582	56	26	2	10	0	161.0	19.29	HINDU	-	+	-	+	-	-	-	26	-	20	+	2.0	4.0	4.0	5.0	4.0	5.0	22.0	128.0	280.0	11.9	109	26	59	120	1	25	MOTHER
14,584	60	34	3	6	5	163.0	17.69	HINDU	6	-	-	-	+	-	-	33	34	35	-	1.0	1.0	2.0	1.0	1.0	1.0	6.0	132.0	228.0	12.4	196	30	58	540	1	36	FATHER
14,585	55	27	2	10	8	166.0	30.85	HINDU	1	-	-	-	+	-	-	-	-	-	+	2.0	3.0	4.0	2.0	3.0	4.0	16.0	152.0	312.0	9.6	192	30	78	222	1	27	MOTHER
14,586	60	37	2	8	9	180.0	22.84	HINDU	7	+	-	+	+	-	-	30	-	+	2.0	3.0	4.0	2.0	3.0	4.0	16.0	104.0	100.0	5.4	147	56	73	89	1	18	-	
14,587	50	25	2	6	5	162.0	27.82	HINDU	-	-	-	-	-	-	-	-	-	-	+	3.0	4.0	4.0	4.0	3.0	5.0	20.0	85.0	136.0	6.5	175	42	112	103	1	18	FATHER
14,589	43	2	-	4	0	165.0	24.98	HINDU	-	-	-	-	-	-	-	10	-	+	4.0	5.0	4.0	5.0	4.0	5.0	23.0	183.0	246.0	10.1	255	34	126	587	1	21	-	
14,594	46	23	2	7	4	172.0	24.68	HINDU	8	+	-	-	-	-	-	-	-	-	+	2.0	3.0	4.0	3.0	3.0	3.0	16.0	248.0	308.0	9.4	138	28	76	170	1	13	MOTHER
14,596	52	30	3	9	6	170.0	32.28	HINDU	1	-	-	+	+	+	-	25	26	27	+	2.0	2.0	3.0	2.0	3.0	3.0	13.0	130.0	150.0	7.6	164	48	93	118	1	30	-
14,598	56	36	2	8	8	172.0	23.83	HINDU	7	-	-	-	+	-	-	-	-	-	+	1.0	2.0	2.0	2.0	2.0	2.0	10.0	81.0	130.0	7.0	109	50	52	34	1	18	FATHER
14,600	72	40	3	18	18	165.0	26.63	HINDU	-	-	-	-	+	-	-	-	-	-	+	0.0	1.0	1.0	1.0	1.0	1.0	5.0	90.0	150.0	7.8	140	30	43	120	1	32	-
14,601	57	23	4	5	7	165.0	26.19	HINDU	10	-	-	-	-	-	-	23	-	+	2.0	3.0	5.0	4.0	4.0	4.0	20.0	236.0	307.0	9.5	192	40	160	300	1	23	-	
14,603	66	40	2	2	10	166.0	21.66	HINDU	-	-	-	+	+	-	-	40	-	+	1.0	2.0	2.0	3.0	3.0	2.0	12.0	167.0	274.0	9.9	126	68	68	102	1	17	FATHER	
14,604	46	25	2	2	0	174.0	21.11	HINDU	-	+	-	-	-	-	20	20	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	120.0	137.0	6.3	148	45	80	113	1	19	FATHER	
14,605	64	41	6	12	8	169.0	20.06	HINDU	-	+	-	+	+	-	-	-	44	-	1.0	1.0	1.0	1.0	1.0	1.0	5.0	302.0	413.0	13.4	111	30	54	132	1	30	MOTHER	
14,606	44	18	1	3	0	175.0	23.64	HINDU	-	-	-	-	-	-	15	10	18	+	4.0	4.0	5.0	5.0	5.0	4.0	23.0	85.0	130.0	6.1	210	30	114	330	1	27	MOTHER	
14,608	53	34	4	16	7	164.0	24.13	HINDU	-	-	+	+	+	-	-	-	-	-	+	2.0	3.0	4.0	4.0	4.0	3.0	18.0	203.0	222.0	10.8	206	55	132	94	1	20	FATHER
14,609	50	22	2	6	4	166.0	23.95	HINDU	-	-	-	+	+	-	-	-	-	-	+	2.0	3.0	3.0	3.0	3.0	4.0	16.0	120.0	252.0	10.1	175	38	106	159	1	31	MOTHER
14,611	38	9	1	1	0	169.0	19.22	HINDU	-	-	-	-	+	-	-	15	-	+	4.0	5.0	5.0	4.0	5.0	5.0	24.0	285.0	368.0	11.3	184	41	102	203	1	24	FATHER	
14,613	63	33	3	2	13	165.0	24.02	HINDU	-	-	-	+	+	-	-	-	43	-	1.0	1.0	1.0	1.0	1.0	1.0	5.0	133.0	181.0	8.7	183	30	122	154	1	21	FATHER/MOTHER	
14,614	45	15	2	2	0	164.0	21.56	HINDU	-	-	-	-	+	-	-	-	30	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	360.0	554.0	12.0	118	36	64	140	1	16	-	
14,615	42	17	1	4	0	170.0	23.46	HINDU	-	-	-	-	+	-	-	-	10	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	107.0	119.0	8.1	218	30	161	136	1	20	MOTHER	
14,616	60	37	5	12	10	161.0	21.95	HINDU	-	-	+	+	+	-	-	-	-	-	-	1.0	2.0	3.0	2.0	2.0	2.0	11.0	146.0	251.0	9.9	245	53	156	181	1	48	-
14,617	45	25	1	3	2	169.0	19.82	HINDU	-	-	-	+	+	-	-	20	-	20	+	2.0	4.0	4.0	3.0	3.0	4.0	18.0	313.0	423.0	11.1	306	46	202	292	1	32	BOTH
14,621	31	5	2	2	0	165.0	23.21	HINDU	-	-	-	-	-	-	-	-	-	-	+	5.0	5.0	5.0	5.0	5.0	4.0	24.0	98.0	107.0	5.5	180	60	190	210	1	17	-
14,623	55	33	3	12	8	158.0	29.04	HINDU	-	-	-	+	+	-	-	28	25	30	+	2.0	2.0	3.0	3.0	3.0	3.0	14.0	161.0	224.0	8.9	210	30	114	330	1	19	MOTHER
14,624	77	53	3	12	20	160.0	22.97	HINDU	24	-	-	+	+	-	-	-	-	-	-	1.0	1.0	1.0	1.0	1.0	1.0	5.0	189.0	245.0	6.1	160	40	50	170	1	22	-
14,625	57	29	2	5	20	164.0	22.90	HINDU	2	+	+	+	+	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	156.0	220.0	12.9	180	60	190	210	1	12	BOTH
14,626	50	27	4	3	10	165.0	30.96	HINDU	-	-	-	-	+	-	-	30	30	30	+	2.0	3.0	4.0	3.0	3.0	3.0	16.0	125.0	206.0	8.1	160	34	39	180	1	26	BOTH
14,627	60	38	4	7	19	159.0	22.23	HINDU	-	-	-	-	-	-	-	40	40	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	194.0	292.0	8.6	218	30	161	136	1	25	-	
14,630	62	32	4	8	13	159.0	25.71	HINDU	-	-	-	-	+	-	-	20	25	-	+	1.0	2.0	4.0	2.0	2.0	2.0	12.0	160.0	173.0	8.5	180	46	98	188	1	28	-
14,631	52	21	3	1	5	161.0	29.09	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	161.0	165.0	9.3	188	21	132	175	1	13	-
14,636	42	17	2	6	0	166.0	23.95	HINDU	-	-	-	-	-	-	15	18	18	+																		

14,089	45	20	2	7	0	160.0	20.78	HINDU	6	-	-	+	-	-	-	-	-	-	+	3.0	4.0	5.0	5.0	5.0	3.0	22.0	120.0	252.0	10.1	175	38	106	159	1	31	-
3,177	56	32	2	6	6	164.0	27.51	HINDU	6	-	+	-	+	-	-	-	-	-	+	3.0	1.0	1.0	1.0	1.0	1.0	5.0	285.0	368.0	11.3	184	41	102	203	1	24	MOTHER
13,587	59	30	6	10	0	165.0	19.10	HINDU	1	-	+	-	+	-	-	-	-	-	+	3.0	5.0	5.0	5.0	5.0	5.0	25.0	133.0	181.0	8.7	183	30	122	154	1	21	
12,806	53	24	1	9	8	159.0	23.73	HINDU	-	-	+	-	+	+	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	360.0	554.0	12.0	160	40	50	170	1	16	-
13,991	58	31	4	15	8	159.0	27.65	MUSLIM	-	-	+	+	-	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	107.0	119.0	8.1	160	34	39	180	1	20	-
19,258	60	28	2	20	12	161.0	25.23	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	4.0	3.0	4.0	4.0	4.0	19.0	146.0	251.0	9.9	245	53	156	181	1	48	-
14,280	52	28	1	23	15	166.0	23.59	HINDU	-	+	-	-	+	-	-	-	-	-	+	3.0	2.0	2.0	2.0	2.0	2.0	10.0	313.0	423.0	11.1	306	46	202	292	1	32	FATHER
13,579	44	20	3	7	0	164.0	26.03	HINDU	-	-	+	+	+	-	-	-	-	-	+	2.0	4.0	5.0	5.0	5.0	3.0	22.0	98.0	107.0	5.5	116	37	57	106	1	17	MOTHER
8,166	58	26	2	14	8	164.0	20.64	HINDU	-	-	+	+	+	-	-	-	-	-	+	3.0	4.0	4.0	5.0	4.0	4.0	21.0	161.0	224.0	8.9	210	30	114	330	1	19	MOTHER
7,093	48	21	1	13	7	160.0	27.50	HINDU	5	-	-	-	-	-	-	-	-	-	+	1.0	2.0	2.0	2.0	3.0	2.0	11.0	189.0	245.0	6.1	160	40	50	170	1	22	FATHER
7,384	40	17	5	6	0	162.0	22.71	HINDU	-	-	-	-	+	-	-	-	-	-		2.0	4.0	5.0	5.0	5.0	3.0	22.0	156.0	220.0	12.9	180	60	190	210	1	12	BOTH
13,549	54	23	1	13	8	166.0	25.55	HINDU	6	-	-	-	+	-	-	-	-	-	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	125.0	206.0	8.1	160	34	39	180	1	26	FATHER
13,911	58	27	2	13	0	168.0	25.33	HINDU	4	-	+	+	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	194.0	292.0	8.6	218	30	161	136	1	25	MOTHER
12,890	43	16	1	9	0	156.0	24.65	HINDU	-	-	-	-	-	-	-	-	-	-	+	2.0	4.0	5.0	5.0	5.0	3.0	22.0	160.0	173.0	8.5	180	46	98	188	1	28	-
3,194	55	20	3	10	5	163.0	22.09	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	161.0	165.0	9.3	188	21	132	175	1	13	MOTHER
11,395	48	22	3	15	0	159.0	32.32	HINDU	-	-	+	-	+	-	-	-	-	-	+	3.0	4.0	5.0	5.0	5.0	3.0	22.0	209.0	266.0	10.5	232	39	132	309	1	30	-
11,693	43	18	2	8	0	168.0	22.32	HINDU	-	-	+	+	+	-	-	-	-	-	+	2.0	4.0	5.0	5.0	5.0	3.0	22.0	79.0	160.0	8.0	116	37	57	106	1	43	FATHER
12,912	43	14	6	8	5	175.0	19.98	HINDU	8	-	+	+	+	-	-	-	-	-	+	3.0	4.0	4.0	3.0	3.0	4.0	18.0	216.0	342.0	11.5	180	30	78	103	1	18	MOTHER
13,562	45	16	2	9	0	167.0	27.79	HINDU	-	-	+	-	+	-	-	-	-	-	+	3.0	4.0	5.0	5.0	4.0	4.0	22.0	125.0	173.0	6.4	160	26	170	160	1	20	-
12,655	55	23	5	20	14	169.0	30.81	HINDU	22	-	+	+	-	-	-	-	-	-	+	3.0	4.0	2.0	4.0	4.0	4.0	18.0	132.0	193.0	7.2	180	56	104	170	1	36	BORTHER
11,503	40	14	4	6	0	165.0	23.51	HINDU	-		+	-	-	-	-	-	-	-	+	1.0	3.0	5.0	5.0	5.0	4.0	22.0	250.0	260.0	12.5	118	36	64	140	1	44	-
9,380	41	15	3	7	0	168.0	25.90	HINDU	-	-	+	-	-	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	138.0	196.0	7.1	184	44	115	124	1	13	-
876	57	19	2	17	12	167.0	32.77	MUSLIM	10	+	+	+	+	-	-	-	-	-	+	3.0	3.0	4.0	3.0	4.0	4.0	18.0	92.0	132.0	5.7	242	44	172	123	1	20	-
14,283	63	29	-	10	9	168.0	22.39	HINDU	3		+	+	+	-	-	-	-	-	+	2.0	4.0	3.0	2.0	4.0	4.0	17.0	163.0	215.0	9.4	160	34	39	180	1	34	FATHER
13,779	43	21	3	3	2	174.0	24.74	HINDU	4	-	-	-	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	116.0	182.0	9.8	150	45	74	149	1	15	MOTHER
8,113	58	24	3	5	0	166.0	23.59	CHRISTIAN	-	-	-	+	-	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	156.0	192.0	11.3	229	32	164	165	1	25	MOTHER
13,278	32	9	2	3	0	163.0	24.84	HINDU	1	+	-	+	+	+	-	-	-	-	+	2.0	3.0	5.0	5.0	5.0	4.0	22.0	157.0	213.0	10.5	232	38	142	259	1	23	FATHER
3,098	54	32	4	6	4	161.0	26.39	HINDU	5	-	-	+	-	-	-	-	-	-	+	3.0	2.0	3.0	3.0	3.0	2.0	13.0	158.0	255.0	9.6	217	40	161	82	1	30	MOTHER
13,371	33	6	2	2	0	165.0	22.08	HINDU	6	-	-	-	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	180.0	240.0	8.3	140	32	140	180	1	18	FATHER
9,929	60	28	2	7	10	170.0	13.98	HINDU	1	-	+	-	-	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	238.0	363.0	12.1	173	31	114	136	1	32	FATHER/MOTHER
11,028	65	26	2	7	12	161.0	25.27	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	3.0	4.0	2.0	3.0	3.0	15.0	162.0	294.0	10.3	145	35	82	141	1	26	-
14,276	66	24	4	12	0	165.0	29.57	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	5.0	5.0	5.0	5.0	5.0	25.0	61.0	171.0	7.2	101	47	40	66	1	38	MOTHER
9,765	35	8	4	6	0	160.0	28.13	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	120.0	206.0	7.1	114	28	67	96	1	16	-
9,632	46	22	3	4	2	167.0	31.48	HINDU	-	-	+	+	+	-	-	-	-	-	+	4.0	4.0	4.0	4.0	4.0	4.0	20.0	115.0	178.0	6.9	141	32	80	144	1	27	BOTH
14,354	44	19	2	3	0	165.0	25.86	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	100.0	121.0	6.1	160	30	70	150	1	27	-
14,000	67	34	2	5	3	170.0	25.95	HINDU	-	+	-	-	+	-	-	-	-	-	+	3.0	4.0	3.0	2.0	3.0	3.0	15.0	236.0	347.0	10.6	170	34	80	184	1	36	MOTHER
1,827	57	26	2	7	4	168.0	24.70	HINDU	5	-	-	+	+	-	-	-	-	-	+	2.0	3.0	4.0	4.0	3.0	3.0	17.0	250.0	264.0	8.9	168	28	79	200	1	32	-
1,512	59	22	3	10	0	186.0	26.42	HINDU	-	-	+	-	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	202.0	296.0	11.2	181	32	115	170	1	21	BOTH
14,281	60	28	2	11	7	169.0	23.18	HINDU	6	-	-	-	-	-	-	-	-	-	+	4.0	3.0	3.0	4.0	3.0	3.0	16.0	169.0	210.0	7.5	200	28	60	140	1	28	BOTH
4,571	54	22	2	16	9	155.0	40.58	HINDU	4	-	-	-	+	-	-	-	-	-	+	1.0	2.0	3.0	2.0	1.0	2.0	10.0	194.0	277.0	9.4	1,435	33	76	156	1	28	-
8,371	68	29	4	24	18	182.0	18.66	HINDU	-	-	-	-	+	-	-	-	-	-	+	1.0	2.0	2.0	2.0	2.0	2.0	10.0	142.0	220.0	8.3	163	37	78	170	1	30	-
12,895	66	27	3	25	0	163.0	23.34	HINDU	-	-	+	-	+	-	-	-	-	-	+	2.0	4.0	4.0	5.0	4.0	5.0	22.0	183.0	107.0	9.6	112	32	40	119	1	20	MOTHER
9,162	59	35	3	9	7	163.0	26.35	HINDU	-	-	+	-	+	-	-	-	-	-	+	3.0	4.0	4.0	5.0	4.0	4.0	21.0	189.0	245.0	6.1	160	40	50	170	1	22	-
14,335	50	24	2	9	6	162.0	26.67	HINDU	-	+	+	+	-	-	-	-	-	-	+	1.0	2.0	2.0	2.0	3.0	2.0	11.0	156.0	220.0	12.9	180	60	190	210	1	12	-
13,502	52	23	6	7	5	156.0	31.23	HINDU	8	-	-	+	+	-	-	-	-	-	+	4.0	3.0	3.0	4.0	3.0	3.0	16.0	125.0	206.0	8.1	160	34	39	180	1	26	FATHER
11,601	52	22	2	8	6	163.0	23.86	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	194.0	292.0	8.6	218	30	161	136	1	25	MOTHER
13,061	48	22	2	8	0	170.0	27.51	HINDU	22	-	-	-	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0</												

13,625	50	22	-	10	7	181.0	17.28	HINDU	-	+	-	+	-	-	-	-	-	-	+	2.0	4.0	3.0	2.0	4.0	4.0	17.0	116.0	182.0	9.8	150	45	74	149	1	15	MOTHER
13,936	53	25	3	14	10	159.0	25.00	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	20.0	167.0	274.0	9.9	126	68	68	102	1	17	UNCLE	
9,994	39	11	2	9	0	181.0	26.68	HINDU	-	-	+	-	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	25.0	120.0	137.0	6.3	148	45	80	113	1	19	-	
14,192	34	7	2	4	0	163.0	25.56	HINDU	-	+	-	-	+	-	-	-	-	-	+	2.0	4.0	5.0	5.0	5.0	4.0	23.0	302.0	413.0	13.4	111	30	54	132	1	30	-
14,363	40	10	2	6	0	162.0	28.04	HINDU	5	-	-	-	-	-	-	-	-	-	+	3.0	4.0	5.0	5.0	5.0	4.0	23.0	85.0	130.0	6.1	184	44	115	124	1	27	-
9,428	42	11	-	7	6	156.0	30.41	HINDU	-	-	-	+	+	+	-	-	-	-	+	3.0	4.0	3.0	2.0	3.0	2.0	14.0	203.0	222.0	10.8	206	55	132	94	1	20	MOTHER/BROTHER
14,188	57	20	2	17	8	163.0	25.22	HINDU	6	-	-	-	+	+	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	120.0	252.0	10.1	175	38	106	159	1	31	-
14,181	56	18	2	15	9	170.0	18.41	HINDU	4	-	-	+	+	-	-	-	-	-	+	3.0	3.0	4.0	2.0	3.0	3.0	15.0	285.0	368.0	11.3	184	41	102	203	1	24	MOTHER
9,750	46	16	-	12	0	167.0	26.53	HINDU	-	-	+	-	+	-	-	-	-	-	-	2.0	5.0	5.0	5.0	5.0	5.0	25.0	133.0	181.0	8.7	183	30	122	154	1	21	MOTHER
5,015	55	21	3	16	12	176.0	16.79	CHRISTIAN	-	+	-	+	-	-	-	-	-	-	+	3.0	3.0	2.0	3.0	3.0	2.0	13.0	360.0	554.0	12.0	163	37	78	170	1	16	-
14,012	48	22	2	12	8	165.0	22.04	HINDU	-	+	-	+	+	-	-	-	-	-	+	4.0	4.0	4.0	4.0	4.0	4.0	20.0	107.0	119.0	8.1	163	37	78	170	1	20	MOTHER
11,823	54	18	2	15	9	161.0	26.97	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	3.0	3.0	2.0	3.0	3.0	14.0	169.0	210.0	7.5	200	28	60	140	1	28	FATHER
13,511	45	20	3	6	4	165.0	24.02	HINDU	8	-	-	+	+	-	-	-	-	-	+	3.0	4.0	3.0	2.0	3.0	3.0	15.0	194.0	277.0	9.4	1,435	33	76	156	1	28	BROTHER
13,368	43	11	2	7	4	165.0	23.88	CHRISTIAN	-	-	+	-	-	-	-	-	-	-	+	2.0	3.0	4.0	4.0	3.0	3.0	17.0	142.0	220.0	8.3	163	37	78	170	1	30	MOTHER
11,052	34	6	2	4	0	168.0	24.80	HINDU	22	-	-	-	+	-	-	-	-	-	-	4.0	5.0	5.0	5.0	5.0	5.0	25.0	183.0	107.0	9.6	112	32	40	119	1	20	MOTHER
527	47	22	2	5	5	173.0	18.54	MUSLIM	-	-	-	+	+	-	-	-	-	-	+	4.0	3.0	3.0	4.0	3.0	3.0	16.0	189.0	245.0	6.1	160	40	50	170	1	22	MOTHER/ FATHER
11,936	57	28	2	8	8	166.0	25.55	HINDU	-	-	-	+	+	-	-	-	-	-	+	1.0	2.0	3.0	2.0	1.0	2.0	10.0	156.0	400.0	12.9	180	60	190	210	1	12	UNCLE
13,725	48	16	2	8	8	159.0	23.58	HINDU	10	-	-	-	-	-	-	-	-	-	+	1.0	2.0	2.0	2.0	2.0	2.0	10.0	110.0	121.0	6.6	178	55	108	71	1	26	-
10,578	30	4	1	1	0	181.0	21.49	HINDU	3	-	-	+	+	-	-	-	-	-	+	2.0	4.0	5.0	5.0	5.0	4.0	23.0	94.0	100.0	6.8	123	40	166	73	1	17	MOTHER
5,529	46	12	2	8	8	159.0	28.28	HINDU	4	-	-	+	+	-	-	-	-	-	+	1.0	1.0	2.0	1.0	1.0	1.0	6.0	94.0	140.0	9.5	201	41	188	66	1	27	-
6,336	40	16	2	10	5	181.0	18.31	HINDU	-	-	-	+	+	-	-	-	-	-	+	2.0	3.0	4.0	2.0	3.0	4.0	16.0	137.0	227.0	6.6	160	39	170	134	1	20	FATHER/MOTHER
11,875	55	27	-	8	10	163.0	22.09	HINDU	1	-	-	-	+	-	-	-	-	-	+	2.0	3.0	4.0	2.0	3.0	4.0	16.0	123.0	171.0	8.5	189	55	108	205	1	29	-
6,669	42	12	3	1	1	162.0	31.13	HINDU	3	-	+	-	-	-	-	-	-	-	+	3.0	4.0	4.0	4.0	3.0	5.0	20.0	120.0	175.0	9.0	213	47	149	106	1	20	-
12,677	41	20	2	5	3	152.0	27.44	HINDU	7	-	-	-	+	-	-	-	-	-	+	3.0	4.0	4.0	5.0	4.0	4.0	21.0	179.0	200.0	7.9	160	40	80	118	1	22	-
9,739	44	19	2	3	2	169.0	21.50	HINDU	5	-	-	-	+	-	-	-	-	-	+	1.0	2.0	2.0	2.0	3.0	2.0	11.0	90.0	180.0	11.5	168	114	113	33	1	25	-
12,078	60	30	1	5	10	159.0	26.78	HINDU	12	-	-	-	+	-	-	-	-	-	+	2.0	2.0	3.0	3.0	3.0	3.0	14.0	208.0	340.0	15.9	161	145	124	45	1	1	-
14,160	54	30	3	9	6	170.0	23.18	HINDU	-	-	-	+	-	-	-	-	-	-	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	265.0	442.0	11.6	202	47	128	136	1	20	FATHER
14,190	46	20	2	6	0	173.0	25.03	HINDU	10	-	-	-	-	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	117.0	179.0	6.2	175	22	118	175	1	18	FATHER
10,424	60	32	2	10	8	171.0	30.09	HINDU	20	-	-	+	-	-	-	-	-	-	+	2.0	3.0	3.0	3.0	3.0	3.0	15.0	145.0	245.0	12.0	90	48	38	42	1	28	MOTHER
12,927	49	24	3	7	6	173.0	21.38	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	132.0	228.0	12.4	196	30	58	540	1	36	UNCLE
6,409	59	31	1	11	8	169.0	25.59	MUSLIM	-	-	-	+	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	135.0	214.0	8.0	249	28	152	343	1	19	-
9,219	60	33	2	15	12	180.0	28.21	HINDU	-	-	-	+	+	+	-	-	-	-	+	2.0	3.0	4.0	4.0	4.0	3.0	18.0	213.0	195.0	8.2	169	22	78	858	1	28	-
13,425	35	9	1	7	0	166.0	22.94	HINDU	-	-	-	-	-	-	-	-	-	-	+	3.0	4.0	5.0	5.0	5.0	4.0	23.0	267.0	302.0	11.8	237	40	128	316	1	27	MOTHER/ FATHER
8,986	55	24	2	20	0	176.0	24.18	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	4.0	5.0	5.0	4.0	4.0	22.0	230.0	370.0	9.8	150	39	64	215	1	25	UNCLE
831	60	35	2	20	10	164.0	24.17	HINDU	-	-	-	-	-	-	-	-	-	-	+	3.0	4.0	-	4.0	4.0	4.0	16.0	208.0	340.0	15.9	161	145	124	45	1	30	-
7,390	54	30	2	13	8	164.0	24.54	HINDU	6	-	-	-	+	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	131.0	223.0	9.9	200	33	138	147	1	36	-
5,852	57	27	2	12	6	168.0	24.23	HINDU	1	-	-	+	-	-	-	-	-	-	+	3.0	3.0	3.0	3.0	3.0	3.0	15.0	130.0	165.0	6.5	159	32	109	91	1	26	MOTHER
14,258	43	18	2	10	4	168.0	21.29	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	3.0	4.0	3.0	4.0	4.0	18.0	146.0	193.0	7.7	180	38	125	189	1	26	-
9,755	42	17	2	7	3	155.0	16.82	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	4.0	3.0	2.0	4.0	4.0	17.0	94.0	205.0	7.3	199	42	129	144	1	17	MOTHER
586	50	24	2	8	5	168.0	23.21	MUSLIM	-	-	-	+	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	170.0	190.0	6.7	170	28	130	160	1	27	-
11,381	53	33	2	9	0	161.0	31.06	HINDU	-	-	-	+	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	94.0	105.0	5.6	149	38	84	135	1	20	-
14,186	55	25	3	6	5	174.0	23.78	HINDU	-	-	-	+	+	-	-	-	-	-	+	2.0	2.0	3.0	2.0	3.0	2.0	12.0	143.0	160.0	7.0	290	32	87	278	1	29	-
13,708	60	33	1	8	5	160.0	34.30	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	2.0	3.0	3.0	3.0	2.0	13.0	147.0	190.0	6.7	165	32	90	180	1	20	-
11,805	48	24	3	8	5	172.0	23.80	HINDU	5	-	-	-	+	-	-	-	-	-	+	3.0	4.0	3.0	2.0	3.0	2.0	14.0	243.0	323.0	10.9	202	47	128	136	1	24	FATHER
13,993	57	32	2	9	5	159.0	29.67	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	184.0	364.0	10.4	202	36	123	215	1	14	-
14,109	36	10	2	3	3	166.0	25.29	HINDU	6	-	-	-	-	-	-	-	-	-	+	3.0	3.0	4.0	2.0	3.0	3.0	15.0	148.0	174.0	6.9	124	35	70	94	2	50	FATHER
11,141	26	4	2	1	0	161.0	35.26	HINDU	4	-	-	-	+	-	-	-	-	-	+	2.0	5.0	5.0	5.0	5.0	5.0	25.0										

12,620	57	-	2	18	0	163.0	24.54	HINDU	3	-	-	+	+	-	-	-	-	-	+	3.0	4.0	5.0	5.0	5.0	4.0	23.0	132.0	228.0	12.4	196	30	58	540	1	36	FATHER
12,881	58	-	1	15	8	163.0	33.50	HINDU	4	-	-	+	+	-	-	-	-	-	+	2.0	3.0	4.0	2.0	3.0	4.0	16.0	152.0	312.0	9.6	192	30	78	222	1	27	-
8,197	43	-	2	12	6	162.0	20.77	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	3.0	4.0	2.0	3.0	4.0	16.0	104.0	100.0	5.4	147	56	73	89	1	18	-
12,939	53	-	2	13	6	156.0	44.17	HINDU	1	-	-	+	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	3.0	5.0	20.0	85.0	136.0	6.5	175	42	112	103	1	18	FATHER
11,524	58	-	2	11	0	163.0	22.21	HINDU	2	-	-	-	+	-	-	-	-	-	+	4.0	5.0	4.0	5.0	4.0	5.0	23.0	183.0	246.0	10.1	255	34	126	587	1	21	-
10,573	45	-	1	15	0	170.0	20.52	HINDU	8	-	-	+	-	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	248.0	308.0	9.4	138	28	76	170	1	13	-
12,056	56	-	2	6	4	167.0	23.31	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	2.0	3.0	2.0	3.0	3.0	13.0	130.0	150.0	7.6	164	48	93	118	1	30	-
9,368	44	-	3	6	0	176.0	24.12	HINDU	-	-	-	+	-	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	81.0	130.0	7.0	109	50	52	34	1	18	MOTHER
14,354	44	23	2	7	0	165.0	32.10	HINDU	12	-	-	-	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	90.0	150.0	7.8	140	30	43	120	1	32	-
14,264	31	-	3	3	0	161.0	26.19	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	4.0	5.0	5.0	5.0	4.0	23.0	236.0	307.0	9.5	140	32	140	180	1	23	-
11,138	58	-	3	15	12	165.0	27.03	HINDU	-	-	-	-	+	+	-	-	-	-	+	1.0	2.0	2.0	3.0	3.0	2.0	12.0	167.0	274.0	9.9	126	68	68	102	1	17	FATHER
9,548	45	-	2	2	0	165.0	27.18	HINDU	-	-	-	+	-	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	120.0	137.0	6.3	148	45	80	113	1	19	MOTHER
14,072	48	-	3	4	0	168.0	23.74	MUSLIM	-	-	-	+	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	302.0	413.0	13.4	111	30	54	132	1	30	MOTHER
14,266	54	-	2	3	0	173.0	17.78	HINDU	4	-	-	-	+	-	-	-	-	-	-	4.0	4.0	5.0	5.0	5.0	4.0	23.0	85.0	130.0	6.1	242	44	172	123	1	27	GRANDMA
13,305	48	-	2	7	0	166.0	26.85	HINDU	1	-	-	+	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	203.0	222.0	10.8	206	55	132	94	1	20	-
14,381	23	-	3	1	0	159.0	20.57	HINDU	-	-	-	+	+	-	-	-	-	-	+	2.0	4.0	5.0	5.0	5.0	4.0	23.0	120.0	252.0	10.1	175	38	106	159	1	31	FATHER
12,410	32	-	1	2	0	181.0	18.31	HINDU	-	-	-	-	-	-	-	-	-	-	+	4.0	4.0	5.0	5.0	5.0	4.0	23.0	285.0	368.0	11.3	184	41	102	203	1	24	-
6,478	48	-	2	9	5	159.0	27.65	HINDU	-	-	-	-	+	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	133.0	181.0	8.7	183	30	122	154	1	21	MOTHER/BROTHER
14,115	59	-	2	10	0	181.0	19.96	HINDU	-	-	-	-	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	360.0	554.0	12.0	232	39	132	309	1	16	MOTHER
11,738	50	-	2	13	0	170.0	22.49	HINDU	5	-	-	+	+	-	-	-	-	-	-	4.0	5.0	5.0	5.0	5.0	5.0	25.0	107.0	119.0	8.1	180	46	98	188	1	20	-
14,231	40	-	2	6	0	167.0	25.10	HINDU	5	-	-	-	-	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	146.0	251.0	9.9	245	53	156	181	1	48	-
11,893	58	-	4	5	3	165.0	20.39	HINDU	10	-	-	+	+	-	-	-	-	-	+	2.0	4.0	4.0	3.0	3.0	4.0	18.0	313.0	423.0	11.1	306	46	202	292	1	32	FATHER
13,534	54	-	2	3	0	170.0	24.36	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	4.0	5.0	4.0	4.0	5.0	22.0	98.0	107.0	5.5	242	44	172	123	1	17	FATHER
13,292	39	-	2	2	0	163.0	22.43	HINDU	6	-	-	+	+	-	-	-	-	-	+	2.0	3.0	5.0	5.0	5.0	4.0	22.0	161.0	224.0	8.9	210	30	114	330	1	19	MOTHER
6,897	60	-	2	10	0	170.0	24.36	HINDU	-	-	-	+	+	-	-	-	-	-	+	2.0	3.0	5.0	4.0	5.0	5.0	22.0	189.0	245.0	6.1	160	40	50	170	1	22	UNCLE
11,702	60	-	3	12	15	167.0	25.64	HINDU	6	-	-	-	+	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	156.0	220.0	12.9	180	60	190	210	1	12	-
14,034	32	-	2	2	0	176.0	19.37	HINDU	1	-	-	+	-	-	-	-	-	-	+	2.0	3.0	5.0	5.0	5.0	4.0	22.0	125.0	206.0	8.1	160	34	39	180	1	26	-
1,335	58	38	5	6	5	165.0	21.56	HINDU	-	-	-	-	-	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	194.0	292.0	8.6	218	30	161	136	1	25	-
10,987	50	-	1	7	4	161.0	31.52	HINDU	-	-	-	-	-	-	-	-	-	-	+	1.0	2.0	4.0	2.0	2.0	2.0	12.0	160.0	173.0	8.5	180	46	98	188	1	28	MOTHER/BROTHER
12,884	44	-	3	6	4	165.0	23.14	HINDU	-	-	-	+	+	-	-	-	-	-	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	161.0	165.0	9.3	188	21	132	175	1	13	-
10,558	52	-	1	5	0	165.0	22.48	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	5.0	5.0	4.0	4.0	4.0	22.0	209.0	266.0	10.5	232	39	132	309	1	30	MOTHER
10,904	52	30	3	4	3	168.0	27.46	HINDU	-	-	-	-	+	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	79.0	160.0	8.0	116	37	57	106	1	43	MOTHER
2,610	56	27	3	3	3	173.0	20.45	HINDU	13	-	-	+	-	-	-	-	-	-	+	2.0	3.0	4.0	2.0	2.0	2.0	13.0	216.0	342.0	11.5	180	30	78	103	1	18	-
10,855	41	-	2	10	0	166.0	28.12	HINDU	-	-	-	+	+	+	-	-	-	-	+	2.0	3.0	5.0	5.0	5.0	4.0	22.0	125.0	173.0	6.4	160	26	170	160	1	20	MOTHER
9,714	50	-	2	10	0	159.0	26.30	HINDU	13	-	-	+	-	-	-	-	-	-	+	2.0	4.0	5.0	4.0	5.0	4.0	22.0	132.0	193.0	7.2	180	56	104	170	1	36	FATHER
14,151	57	-	2	10	7	181.0	22.80	HINDU	6	-	-	-	+	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	250.0	260.0	12.5	118	36	64	140	1	44	BROTHER
11,016	50	28	3	16	0	158.0	35.01	HINDU	1	-	-	-	-	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	138.0	196.0	7.1	184	44	115	124	1	13	MOTHER
11,705	36	-	1	7	0	176.0	21.92	HINDU	-	-	-	-	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	92.0	132.0	5.7	242	44	172	123	1	20	MOTHER
10,692	52	-	2	8	4	158.0	29.48	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	3.0	4.0	3.0	3.0	2.0	15.0	163.0	215.0	9.4	160	34	39	180	1	34	MOTHER/ FATHER
12,560	60	-	2	9	5	160.0	28.91	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	3.0	4.0	4.0	4.0	4.0	19.0	116.0	182.0	9.8	150	45	74	149	1	15	UNCLE
12,653	43	-	2	11	0	163.0	27.51	HINDU	-	-	-	+	+	-	-	-	-	-	+	1.0	3.0	5.0	5.0	5.0	4.0	22.0	156.0	192.0	11.3	229	32	164	165	1	25	-
12,130	53	-	2	13	0	170.0	31.63	HINDU	-	-	-	+	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	157.0	213.0	10.5	232	38	142	259	1	23	MOTHER
13,988	60	-	6	20	12	168.0	22.39	HINDU	-	-	-	-	+	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	158.0	255.0	9.6	217	40	161	82	1	30	-
9,437	59	-	2	20	7	156.0	30.78	HINDU	5	-	-	+	+	-	-	-	-	-	+	2.0	3.0	4.0	3.0	3.0	3.0	16.0	180.0	240.0	8.3	140	32	140	180	1	18	FATHER/MOTHER
5,861	51	-	3	15	9	172.0	21.97	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	2.0	3.0	2.0	2.0	2.0	11.0	238.0	363.0	12.1	173	31	114	136	1	32	-
10,999	60	-	2	15	12	170.0	22.84	HINDU	6	-	-	-	-	-	-	-	-	-	+	3.0	4.0	3.0	3.0	3.0	3.0	16.0	162.0	294.0	10.3	145	35	82	141	1	26	-
7,400	57	-	3	14	11	169.0	23.95	HINDU	4	-	-	-	+	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	61.0	171.0	7.2	101	47					

13,379	60	-	2	30	15	163.0	20.32	HINDU	3	-	-	+	+	-	-	-	-	-	+	2.0	4.0	3.0	2.0	4.0	4.0	17.0	163.0	215.0	9.4	160	34	39	180	1	34	-
13,551	53	-	2	13	8	170.0	17.30	HINDU	4	-	-	-	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	20.0	116.0	182.0	9.8	150	45	74	149	1	15	MOTHER	
9,448	56	29	4	16	0	167.0	16.85	HINDU	-	-	-	-	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	25.0	156.0	192.0	11.3	229	32	164	165	1	25	MOTHER	
13,082	42	-	2	9	6	176.0	27.44	HINDU	1	-	-	-	+	-	-	-	-	-	+	2.0	2.0	3.0	2.0	3.0	2.0	12.0	157.0	213.0	10.5	232	38	142	259	1	23	-
8,272	50	30	4	10	0	165.0	27.18	HINDU	2	-	-	+	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	158.0	255.0	9.6	217	40	161	82	1	30	MOTHER
10,903	56	-	2	12	6	161.0	28.16	HINDU	8	-	-	+	-	-	-	-	-	-	+	3.0	4.0	3.0	2.0	3.0	2.0	14.0	180.0	240.0	8.3	140	32	140	180	1	18	FATHER
5,866	54	-	2	21	15	165.0	24.98	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	20.0	238.0	363.0	12.1	173	31	114	136	1	32	BROTHER	
8,400	37	-	3	10	0	165.0	26.81	HINDU	-	-	-	+	-	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	162.0	294.0	10.3	145	35	82	141	1	26	MOTHER
13,309	35	-	2	7	0	168.0	33.06	HINDU	12	-	-	+	+	-	-	-	-	-	+	2.0	5.0	5.0	5.0	5.0	25.0	61.0	171.0	7.2	101	47	40	66	1	38	MOTHER	
6,978	50	-	2	12	9	173.0	23.56	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	3.0	2.0	3.0	3.0	2.0	13.0	120.0	206.0	7.1	114	28	67	96	1	16	MOTHER/ FATHER
12,328	54	-	3	14	8	166.0	26.31	HINDU	-	-	-	-	+	-	-	-	-	-	+	4.0	4.0	4.0	4.0	4.0	20.0	115.0	178.0	6.9	141	32	80	144	1	27	UNCLE	
13,310	53	-	2	10	5	159.0	28.20	HINDU	-	-	-	-	-	-	-	-	-	-	+	3.0	3.0	3.0	2.0	3.0	3.0	14.0	100.0	121.0	6.1	160	30	70	150	1	27	-
13,024	54	-	3	14	8	181.0	18.22	HINDU	-	-	-	+	+	+	-	-	-	-	+	3.0	4.0	3.0	2.0	3.0	3.0	15.0	236.0	347.0	10.6	170	34	80	184	1	36	MOTHER
13,373	42	-	2	7	0	165.0	23.47	HINDU	4	-	-	-	+	-	-	-	-	-	+	5.0	5.0	5.0	5.0	5.0	4.0	24.0	250.0	264.0	8.9	168	28	79	200	1	32	-
13,895	55	-	3	6	0	168.0	20.30	HINDU	1	-	-	+	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	25.0	202.0	296.0	11.2	181	32	115	170	1	21	FATHER/MOTHER	
9,680	55	-	3	10	7	158.0	29.00	HINDU	-	-	-	-	+	-	-	-	-	-	+	4.0	3.0	3.0	4.0	3.0	3.0	16.0	169.0	210.0	7.5	200	28	60	140	1	28	-
12,431	44	-	2	9	0	165.0	23.84	HINDU	-	-	-	+	-	-	-	-	-	-	+	1.0	3.0	5.0	5.0	5.0	4.0	22.0	194.0	277.0	9.4	1,435	33	76	156	1	28	-
10,846	55	-	3	10	6	168.0	23.38	HINDU	-	-	-	+	+	-	-	-	-	-	+	1.0	2.0	2.0	2.0	2.0	2.0	10.0	142.0	220.0	8.3	163	37	78	170	1	30	-
10,999	59	-	2	9	0	170.0	19.00	HINDU	-	-	-	-	+	-	-	-	-	-	-	2.0	4.0	4.0	5.0	4.0	5.0	22.0	183.0	107.0	9.6	112	32	40	119	1	20	-
11,225	51	-	3	9	0	168.0	23.17	HINDU	5	-	-	+	+	-	-	-	-	-	+	4.0	4.0	5.0	5.0	5.0	4.0	23.0	147.0	190.0	6.7	165	32	90	180	1	20	MOTHER/ FATHER
3,794	54	-	2	17	14	156.0	23.83	HINDU	5	-	-	-	-	-	-	-	-	-	+	2.0	3.0	4.0	4.0	4.0	3.0	18.0	243.0	323.0	10.9	202	47	128	136	1	24	-
14,076	48	-	2	8	0	172.0	22.92	HINDU	10	-	-	-	+	-	-	-	-	-	+	2.0	3.0	5.0	5.0	5.0	4.0	22.0	184.0	364.0	10.4	202	36	123	215	1	14	MOTHER
14,032	46	-	2	6	0	170.0	19.69	HINDU	-	-	-	+	+	-	-	-	-	-	+	4.0	5.0	5.0	4.0	5.0	5.0	24.0	148.0	174.0	6.9	124	35	70	94	2	50	-
14,340	45	-	2	7	0	169.0	19.82	HINDU	6	-	-	+	+	-	-	-	-	-	+	3.0	4.0	4.0	5.0	5.0	4.0	22.0	196.0	242.0	10.8	135	28	98	47	1	37	MOTHER
12,590	54	-	2	10	0	164.0	23.50	MUSLIM	-	-	-	-	-	-	-	-	-	-	-	3.0	5.0	5.0	5.0	5.0	5.0	25.0	92.0	150.0	5.8	130	27	100	150	1	24	-
13,389	39	-	2	9	0	167.0	26.00	HINDU	6	-	-	+	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	25.0	115.0	83.0	6.3	201	54	120	136	1	20	FATHER	
14,323	45	-	2	5	0	171.0	20.11	HINDU	1	-	-	+	+	-	-	-	-	-	+	1.0	3.0	5.0	5.0	5.0	4.0	22.0	230.0	370.0	9.8	150	39	64	215	1	25	MOTHER
14,321	43	-	2	6	0	167.0	22.09	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	4.0	4.0	5.0	5.0	4.0	22.0	222.0	272.0	13.1	132	30	20	150	1	32	FATHER/MOTHER
12,093	50	-	2	12	0	170.0	29.17	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	4.0	5.0	4.0	4.0	5.0	22.0	103.0	252.0	6.2	132	28	98	150	1	35	MOTHER
14,199	48	-	2	8	4	169.0	19.68	HINDU	-	-	-	-	-	-	-	-	-	-	+	2.0	2.0	3.0	3.0	3.0	3.0	14.0	133.0	228.0	8.6	135	32	89	156	1	-	MOTHER
9,772	56	-	2	20	0	175.0	21.22	HINDU	-	-	-	-	+	-	-	-	-	-	+	1.0	4.0	5.0	5.0	5.0	4.0	23.0	295.0	452.0	15.3	241	29	58	1,245	1	21	MOTHER
13,438	54	-	2	15	0	158.0	30.20	HINDU	-	-	-	-	+	-	-	-	-	-	+	1.0	4.0	5.0	5.0	5.0	4.0	23.0	136.0	246.0	9.0	192	40	160	300	1	34	MOTHER/FATHER
8,988	58	-	2	20	16	160.0	25.78	HINDU	13	-	-	-	+	-	-	-	-	-	+	2.0	3.0	4.0	3.0	3.0	3.0	16.0	138.0	181.0	6.6	270	40	96	163	1	32	MOTHER
12,894	40	-	2	8	0	165.0	21.49	HINDU	-	-	-	+	-	-	-	-	-	-	+	3.0	4.0	4.0	5.0	5.0	4.0	22.0	128.0	280.0	11.9	109	26	59	120	1	25	FATHER
8,685	59	-	3	9	7	173.0	19.31	HINDU	13	-	-	-	-	-	-	-	-	-	+	1.0	2.0	4.0	2.0	2.0	2.0	12.0	132.0	228.0	12.4	196	30	58	540	1	36	FATHER
11,183	57	-	4	7	4	165.0	26.04	HINDU	-	-	-	+	-	-	-	-	-	-	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	152.0	312.0	9.6	192	30	78	222	1	27	-
7,761	58	-	3	8	0	161.0	26.54	HINDU	12	-	-	-	+	-	-	-	-	-	+	3.0	5.0	5.0	4.0	4.0	4.0	22.0	104.0	100.0	5.4	147	56	73	89	1	18	FATHER MOTHER
11,288	40	-	3	4	3	163.0	29.36	HINDU	-	-	-	+	+	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	85.0	136.0	6.5	175	42	112	103	1	18	-
9,404	55	-	2	5	3	171.0	25.41	HINDU	-	-	-	+	+	+	-	-	-	-	+	2.0	3.0	4.0	2.0	2.0	2.0	13.0	183.0	246.0	10.1	255	34	126	587	1	21	MOTHER
9,380	42	-	2	2	2	173.0	18.71	HINDU	-	-	-	-	-	-	-	-	-	-	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	248.0	308.0	9.4	138	28	76	170	1	13	MOTHER
13,954	51	-	2	11	0	167.0	20.98	HINDU	-	-	-	+	+	-	-	-	-	-	+	1.0	4.0	5.0	5.0	5.0	4.0	23.0	130.0	150.0	7.6	164	48	93	118	1	30	FATHER
11,453	52	-	2	12	8	158.0	25.72	HINDU	4	-	-	-	-	-	-	-	-	-	+	1.0	1.0	1.0	1.0	1.0	1.0	5.0	81.0	130.0	7.0	109	50	52	34	1	18	MOTHER
13,450	43	-	2	12	0	173.0	26.40	HINDU	1	-	-	-	+	-	-	-	-	-	+	3.0	4.0	5.0	5.0	5.0	4.0	23.0	90.0	150.0	7.8	140	30	43	120	1	32	-
13,371	40	-	3	3	0	164.0	25.91	HINDU	-	-	-	+	-	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	25.0	236.0	307.0	9.5	255	34	126	587	1	23	FATHER	
11,268	47	-	2	7	0	173.0	21.28	HINDU	-	-	-	+	+	-	-	-	-	-	+	2.0	4.0	5.0	5.0	5.0	4.0	23.0	167.0	274.0	9.9	126	68	68	102	1	17	-
5,355	55	-	1	5	3	160.0	32.81	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	3.0	4.0	4.0	4.0	4.0	19.0	120.0	137.0	6.3	148	45	80	113	1	19	MOTHER
876	57	-	2	20	12	158.0	28.36	MUSLIM	-	-	-	+	+	-	-	-	-	-	+	2.0	4.0	4.0	3.0	3.0	3.0	17.0	302.0	413.0	13.4	111	30	54	132	1	30	-
13,224	60	-	3	20	15																															

14,017	55	-	2	7	3	165.0	21.01	HINDU	-	-	-	+	-	-	-	-	-	-	+	3.0	4.0	4.0	5.0	4.0	4.0	21.0	161.0	224.0	8.9	210	30	114	330	1	19	FATHER/MOTHER
6,985	55	-	3	6	4	166.0	25.00	HINDU	-	-	-	-	+	-	-	-	-	-	+	1.0	2.0	2.0	2.0	3.0	2.0	11.0	189.0	245.0	6.1	160	40	50	170	1	22	-
14,051	54	-	2	8	0	174.0	24.11	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	3.0	5.0	5.0	5.0	4.0	22.0	156.0	220.0	12.9	180	60	190	210	1	12	MOTHER
14,033	55	-	2	6	3	169.0	24.16	HINDU	13	-	-	-	-	-	-	-	-	-	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	125.0	206.0	8.1	160	34	39	180	1	26	-
7,166	43	-	2	8	0	175.0	22.96	HINDU	-	-	-	-	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	194.0	292.0	8.6	218	30	161	136	1	25	BOTH
7,667	55	-	2	5	2	164.0	20.08	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	3.0	3.0	3.0	3.0	3.0	15.0	160.0	173.0	8.5	180	46	98	188	1	28	-
12,323	51	-	2	8	0	166.0	18.14	HINDU	-	-	-	-	-	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	161.0	165.0	9.3	188	21	132	175	1	13	MOTHER
14,419	54	-	2	8	4	169.0	16.46	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	209.0	266.0	10.5	232	39	132	309	1	30	-
11,931	39	-	2	9	6	165.0	31.22	HINDU	-	-	-	+	+	-	-	-	-	-	+	2.0	3.0	4.0	4.0	4.0	4.0	18.0	79.0	160.0	8.0	116	37	57	106	1	43	BOTH
13,383	55	-	3	5	4	164.0	27.51	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	4.0	4.0	3.0	3.0	4.0	18.0	216.0	342.0	11.5	180	30	78	103	1	18	BOTH
5,821	55	-	2	10	0	170.0	25.26	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	4.0	5.0	5.0	4.0	4.0	22.0	125.0	173.0	6.4	160	26	170	160	1	20	-
12,233	40	-	2	7	0	163.0	25.59	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	132.0	193.0	7.2	180	56	104	170	1	36	-
6,796	56	-	2	6	0	170.0	25.26	HINDU	-	-	-	+	-	-	-	-	-	-	+	1.0	3.0	5.0	5.0	5.0	4.0	22.0	250.0	260.0	12.5	118	36	64	140	1	44	-
12,379	46	-	2	8	0	167.0	33.45	HINDU	3	-	-	-	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	138.0	196.0	7.1	184	44	115	124	1	13	FATHER
9,074	48	-	2	8	4	176.0	22.76	HINDU	-	-	-	+	-	-	-	-	-	-	+	3.0	3.0	4.0	3.0	4.0	4.0	18.0	92.0	132.0	5.7	242	44	172	123	1	20	-
10,386	55	-	2	5	0	165.0	26.63	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	4.0	5.0	5.0	4.0	4.0	22.0	163.0	215.0	9.4	160	34	39	180	1	34	-
11,908	44	-	2	4	2	161.0	27.51	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	116.0	182.0	9.8	150	45	74	149	1	15	-
5,014	51	-	2	6	0	165.0	21.93	HINDU	-	-	-	-	+	+	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	156.0	192.0	11.3	229	32	164	165	1	25	MOTHER
9,220	59	-	1	9	6	165.0	23.47	HINDU	3	-	-	+	-	-	-	-	-	-	+	2.0	2.0	3.0	2.0	3.0	2.0	12.0	157.0	213.0	10.5	232	38	142	259	1	23	-
12,254	38	-	1	5	0	168.0	20.30	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	4.0	5.0	5.0	4.0	4.0	22.0	158.0	255.0	9.6	217	40	161	82	1	30	-
14,346	35	-	2	5	0	173.0	24.19	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	4.0	5.0	5.0	4.0	4.0	22.0	180.0	240.0	8.3	140	32	140	180	1	18	-
12,243	53	-	3	13	0	166.0	23.55	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	238.0	363.0	12.1	173	31	114	136	1	32	-
13,470	47	-	3	7	0	159.0	26.11	HINDU	-	-	-	+	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	162.0	294.0	10.3	145	35	82	141	1	26	FATHER
10,212	59	-	3	19	0	181.0	16.76	HINDU	10	-	-	-	-	-	-	-	-	-	-	2.0	5.0	5.0	5.0	5.0	5.0	25.0	61.0	171.0	7.2	101	47	40	66	1	38	MOTHER
11,893	58	-	2	8	0	165.0	24.02	HINDU	3	-	-	-	+	-	-	-	-	-	+	3.0	3.0	5.0	5.0	5.0	4.0	22.0	120.0	206.0	7.1	114	28	67	96	1	16	MOTHER
5,365	54	-	3	7	4	168.0	20.55	HINDU	-	-	-	-	+	-	-	-	-	-	+	4.0	4.0	4.0	4.0	4.0	4.0	20.0	115.0	178.0	6.9	141	32	80	144	1	27	FATHER
11,805	48	-	2	10	0	158.0	27.16	HINDU	-	-	-	-	+	-	-	-	-	-	+	3.0	4.0	5.0	5.0	3.0	3.0	22.0	100.0	121.0	6.1	160	30	70	150	1	27	BOTH
11,325	45	-	2	6	5	165.0	20.90	HINDU	10	-	-	-	-	-	-	-	-	-	+	3.0	4.0	3.0	2.0	3.0	3.0	15.0	236.0	347.0	10.6	170	34	80	184	1	36	FATHER
14,407	40	-	2	9	0	168.0	20.05	HINDU	-	-	-	+	+	-	-	-	-	-	+	2.0	3.0	5.0	5.0	5.0	4.0	22.0	250.0	264.0	8.9	168	28	79	200	1	32	MOTHER
14,395	53	-	2	13	0	170.0	21.87	HINDU	-	-	-	-	+	-	-	-	-	-	-	4.0	5.0	5.0	5.0	5.0	5.0	25.0	202.0	296.0	11.2	181	32	115	170	1	21	-
12,933	44	-	1	7	0	168.0	25.69	HINDU	-	-	-	+	+	-	-	-	-	-	+	4.0	3.0	5.0	5.0	5.0	4.0	22.0	169.0	210.0	7.5	200	28	60	140	1	28	MOTHER
11,663	52	-	2	12	7	156.0	24.16	HINDU	-	-	-	+	+	-	-	-	-	-	+	1.0	2.0	3.0	2.0	1.0	2.0	10.0	194.0	277.0	9.4	1,435	33	76	156	1	28	-
13,780	50	-	2	15	0	172.0	20.82	HINDU	-	-	-	-	+	-	-	-	-	-	+	1.0	4.0	4.0	5.0	5.0	4.0	22.0	142.0	220.0	8.3	163	37	78	170	1	30	FATHER
1,827	53	-	1	13	0	170.0	29.17	HINDU	-	-	-	+	-	-	-	-	-	-	+	2.0	4.0	4.0	5.0	4.0	5.0	22.0	183.0	107.0	9.6	112	32	40	119	1	20	MOTHER
3,673	60	-	4	25	20	169.0	19.68	HINDU	-	-	-	-	-	-	-	-	-	-	+	1.0	2.0	2.0	2.0	2.0	2.0	10.0	189.0	245.0	6.1	160	40	50	170	1	22	-
13,998	53	-	4	11	7	164.0	24.17	HINDU	-	-	-	-	-	-	-	-	-	-	+	1.0	2.0	2.0	2.0	3.0	2.0	11.0	156.0	220.0	12.9	180	60	190	210	1	12	BROTHER
13,349	51	-	2	20	0	167.0	27.04	HINDU	7	-	-	+	+	-	-	-	-	-	+	4.0	3.0	5.0	5.0	5.0	4.0	22.0	125.0	206.0	8.1	160	34	39	180	1	26	-
13,088	55	-	2	16	10	171.0	22.57	HINDU	-	-	-	+	+	-	-	-	-	-	+	2.0	4.0	4.0	4.0	4.0	4.0	20.0	194.0	292.0	8.6	218	30	161	136	1	25	-
5,662	52	-	1	12	0	167.0	20.98	HINDU	-	-	-	-	+	-	-	-	-	-	+	4.0	5.0	5.0	5.0	5.0	5.0	25.0	160.0	173.0	8.5	180	46	98	188	1	28	-
12,326	45	-	1	15	0	170.0	20.00	HINDU	6	-	-	+	-	-	-	-	-	-	+	3.0	4.0	4.0	5.0	5.0	4.0	22.0	161.0	165.0	9.3	188	21	132	175	1	13	-
13,579	49	-	2	21	16	169.0	24.82	HINDU	1	-	-	+	+	+	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	209.0	266.0	10.5	232	39	132	309	1	30	-
9,082	59	-	3	19	15	175.0	22.47	HINDU	7	-	-	+	-	-	-	-	-	-	+	3.0	4.0	4.0	4.0	4.0	4.0	20.0	79.0	160.0	8.0	116	37	57	106	1	43	-
12,754	54	-	2	14	0	158.0	31.24	HINDU	-	-	-	-	+	-	-	-	-	-	+	2.0	3.0	5.0	5.0	5.0	4.0	22.0	216.0	342.0	11.5	180	30	78	103	1	18	-
13,127	30	-	2	4	0	160.0	29.02	HINDU	-	-	-	-	-	-	-	-	-	-	+	3.0	4.0	4.0	5.0	5.0	4.0	22.0	125.0	173.0	6.4	160	26	170	160	1	20	-
13,350	58	-	2	18	0	165.0	20.57	HINDU	8	-	-	-	+	-	-	-	-	-	+	3.0	4.0	5.0	5.0	4.0	4.0	22.0	132.0	193.0	7.2	180	56	104	170	1	36	-
8,658	57	-	2	17	15	173.0	19.55	HINDU	1	-	-	-	+	-	-	-	-	-	+	3.0	3.0	4.0	3.0	3.0	3.0	16.0	250.0	260.0	12.5	118	36	64	140	1	44	-
9,739	44	-	2	8	0	165.0	23.58	HINDU	7	-	-	-	+	-	-	-	-	-	+	1.0	3.0	5.0	5.0	5.0	4.0	22.0	138.0	196.0	7.1	184	44	115	124	1	13	-

