"EFFECTS OF CONSANGUINEOUS MARRIAGE ON FERTILITY, PREGNANCY OUTCOMES AND ON HEALTH STATUS OF UNDER–FIVE YEAR CHILDREN – A RURAL CROSS–SECTIONAL STUDY"

By

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IN

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Under the Guidance of

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J.N.MEDICAL COLLEGE, NEHRU NAGAR,
BELGAUM-590010.

MAY 2010

KLE UNIVERSITY, BELGAUM

Declaration by the Candidate

I hereby declare that this dissertation entitled **"EFFECTS OF CONSANGUINEOUS MARRIAGE ON FERTILITY, PREGNANCY OUTCOMES AND ON HEALTH STATUS OF UNDER–FIVE YEAR CHILDREN–A RURAL CROSS–SECTIONAL STUDY"** is a bonafide and genuine research work carried out by me, under the guidance of **Dr. S. M. KATTI** $_{MD}$ Professor, Department of Community Medicine, J. N. Medical College, Belgaum.

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DR.VEENA Y.KABADI

LIST OF ABBREVATIONS

ADD – Acute Diarrhoeal Disease

ARI – Acute Respiratory Tract Infection

ASD – Atrial Septal Defect

CHD – Congenital Heart Disease

FP – Family Planning

PDA – Patent Ductus Arteriosus

PHC – Primary Health Care

SES – Socio-economic Status

SIBS - Siblings

TOF – Tetralogy Of Fallot

VSD – Ventricular Septal Defect

ABSTRACT

Background and objectives

Marriage between two individuals who have at least one traceable common ancestor is said to be "consanguineous". Consanguineous marriages have more chances of bringing rare recessive alleles together leading to various ill–effects such as infertility, repeated abortions, stillbirths, congenital malformations, mental retardations etc in children. The objectives of the present study are to know the prevalence of consanguineous marriage; fertility pattern, pregnancy outcomes and the effects of consanguinity on health status of under-five year children.

Methodology

The present study was conducted in Khaderwadi village which is one of the villages under Primary Health Centre Kinaye, adopted by J.N.Medical college, Belgaum. The study was conducted from 1st January 2008 to 31st December 2008. A total of 755 married women were interviewed using predesigned and pretested structured questionnaire and 474 under-five year children were clinically examined to assess their health status and presence of any congenital malformation.

Results

In the present study the prevalence of consanguineous marriage was 27.94%. The most common type of marriage was between cross-cousin (44.08%) followed by uncle-niece (28.90%). The most common reason for consanguineous marriage was preference of mates within kin group (28.43%). The consanguinity was higher among illiterate women 109 (51.66%) compared to women in non–consanguineous marriage 197 (36.21%). The parity ≥ 6 was higher 29 (13.75%) in consanguineous marriage compared to non-consanguineous marriage where it was 34 (6.25%). The total number of pregnancies in consanguineous marriage was 770 out of which 48 (6.25%)

had abortions, 18 (2.33%) still births and 704 (91.42%) live births and in non-consanguineous marriage the total numbers of pregnancies were 1594 out of which 57 (3.57%) had abortions, 17 (1.06%) still births and 1520 (95.37%) live births and was statistically significant. A significantly higher 63 (8.94%) number of under-five mortality was seen in children in consanguineous marriage compared to 77 (5.05%) in non-consanguineous. A higher number of participants gave congenital anomalies as the reason for under-five mortality in consanguineous marriage 21(33.34%) compared to non-consanguineous marriage 10 (12.98%). Out of 130 children in consanguineous marriage 4 (3.07%) had mental retardation and epilepsy, 3 (2.30%) mental retardation only, another 3 (2.30%) had CHD, 2 (1.53%) deaf mute, 2 (1.53%) cleft lip and 1 (0.80%) child had epilepsy. Out of 344 children in non-consanguineous marriage only 1(0.29%) child had mental retardation. A significant association was observed between consanguineous marriage and congenital morbidities like mental retardation, epilepsy, mental retardation with epilepsy and CHD. However, no such significant association was observed between deaf mute and cleft lip and consanguineous marriage.

Conclusion

In the present study, it was revealed that more than one fourth (27.94%) of the marriages were between relatives. The consanguinity was associated with adverse pregnancy outcomes like abortions and still births. There was significant association between congenital morbidities and consanguinity. The under-five mortality was observed to be higher among the consanguineously married couples.

Keys words:

Consanguinity; prevalence; fertility; pregnancy outcomes; under-five mortality; congenital morbidities.

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INTRODUCTION

Marriages are universal and sacramental. Everyone, sooner or later gets married and participates in reproduction .[1] Marriage, a socio-cultural custom , is the basis for procreation and therefore , certain marriage practices of assortative nature deviating from pan mixes – especially those between relatives , have receiving wide spread attention from various fields. Marriage between two individuals who have at least one traceable common ancestor is said to be "consanguineous" and offspring of such mating "inbred" .[2]

The word consanguineous comes from two Latin words "Con'' meaning shared and " Sanguis '' meaning blood .[3] The tradition of consanguineous is old and in some countries, such marriages were encouraged . Consanguineous marriages are widely practiced globally. Marriages between close relatives serve important social, cultural, economic functions and may have both positive and negative biologic consequences .[4]

In many populations of the developing world, marriage between biological relatives remains common. This is especially true in societies where Islam prevails, with consanguineous marriage accounting 20.00-50.00 % of all marriages. But, even among Muslims, first and more distant cousin unions are acceptable; uncle – niece marriages are not permissible being regarded as incest relation. However, consanguinity is not unique to Muslim societies rather; it has been found that about 20.00-45.00 % of unions in south India, where Hindu belief prevails, are between blood relatives. The socio-cultural customs has been documented among some sects in West and South Asia, such as the Buddhist, Christian, Jews, Parses and Druze.[5]

This, in turn, shows that while in general consanguinity results from religious norms and perceptions, cultural and historical factors are also important in maintaining this practice. Irrespective of the reasons supporting such marriage, it has been found a higher prevalence of consanguinity among rural, the less educated and among who marry at younger ages.[5]

It is important at this point to bear in mind that even while modernization may inevitably reduce the incidence of consanguinity, it still may not totally eradicate its practice. There are various reasons for that. First, such marriage is considered more socially stable and economically beneficial, through the maintenance of family fortune, which is preserved within the extended family structure and tribe. A second reason is the increasing better prospects of the young couples, especially for daughters. This is so because unions between relatives enhance women's status by allowing her a better relationship with her spouse and his family. Additionally, factors supporting this practice are perceived risks of marrying to a stranger and the easiness of the marriage preparation among family members. Finally, in high fertility societies, marriage between cousins is likely to remain quite common for sometime because of the increase in the survivability of the children with improvements in public health service .[5] In India, the main reasons for these marriages are stronger family ties, the integrity of estates and the like.[3]

Globally, the most common form of consanguineous unions contracted is between first cousins, in which the spouses share 1/8 of their genes inherited from a common ancestor, and so their progeny are homozygous (or more correctly autozygous) at 1/16 of all loci . Among the major population so far studied, the highest rates of consanguineous marriage have been associated with low socio-economic status, illiteracy and rural residence. [6] It is a well – known fact that

the consanguineous marriages have more chances of bringing rare recessive alleles together leading to various ill – effects such as infertility, repeated abortions, stillbirths, congenital malformations, mental retardations etc in children for the off-spring of the first cousins the incidence of congenital malformations is increased to approximately 2 ½ times that which is seen in the off-spring of unrelated parents. Though there is some recognition of the potential disadvantageous genetic effects of consanguinity, the communities also strongly believe that these effects are greatly overweighed by social advantages such as greater marital and family stability .[7]

Although marriages between close biological kin are preferential in many parts of the World, there still is a great lack of knowledge of this central feature of human kinship structure. Unfortunately, in many of the more populous countries representative information on consanguineous marriage is sparse or even unavailable.[6] The effects of consanguineous marriage on fertility, pregnancy outcomes and under-five years children have been conflicting. Hence, this study was undertaken to know the above effects on consanguinity.

OBJECTIVES OF THE STUDY

1. To estimate the prevalence of consanguineous marriage.
2. To know the fertility pattern and pregnancy outcomes like live births, abortions and still births.
3. To know the effects of consanguinity on health status of under five year children.

REVIEW OF LITERATURE

Consanguinity and Prevalence:

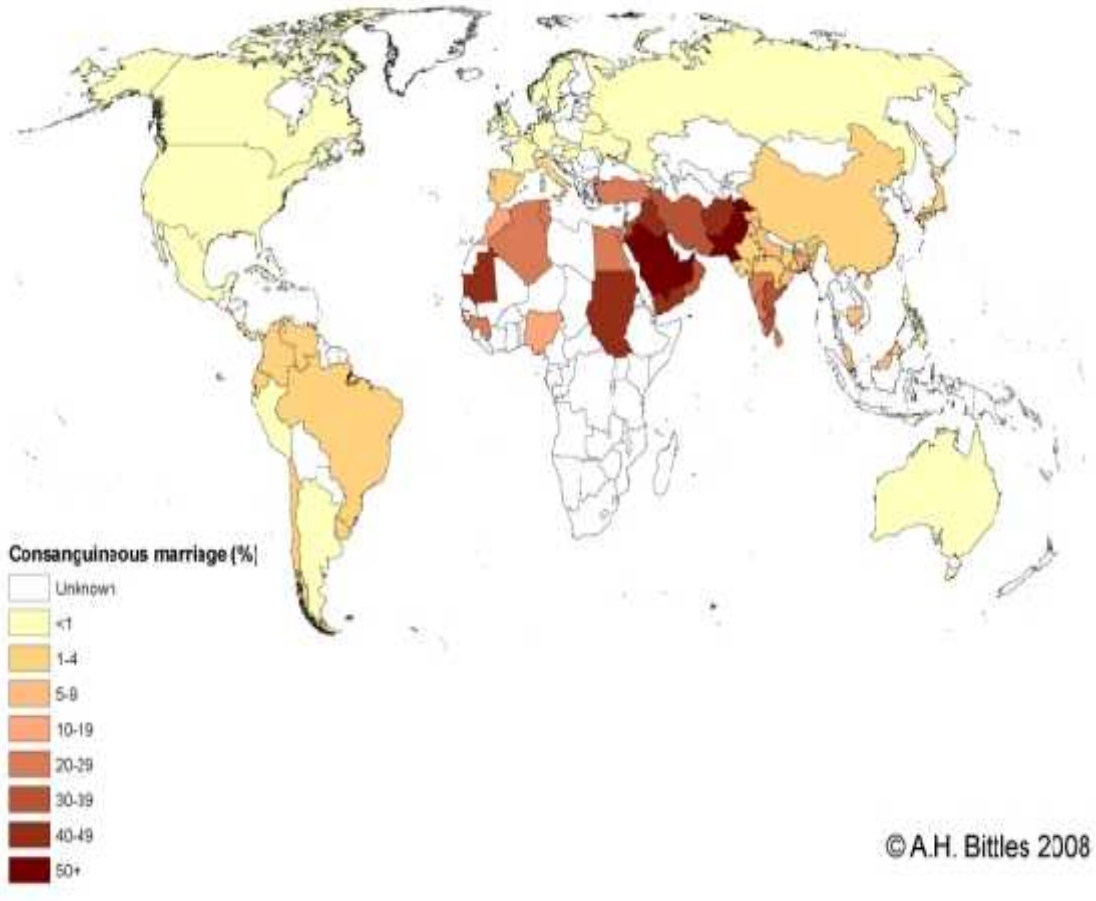
It is estimated that globally about 20.00% population live in communities having a preference for consanguineous marriage and at least 8.80 % of children have parents who are consanguineously married. The prevalence of consanguineous marriage varies from 2.00 – 4.00 % in France, UK, USA and Japan to 50.00 – 60.00% in Jordan, Saudi Arabia and Kuwait. The incidence in India shows a wide range from 5.00 – 60.00 % depending upon different religions and geographical areas .[7]

One out of every 6 (16.00 %) marriages in India is among biological relatives. The prevalence of such marriage, however is not uniformly distributed, varying from a very low level of 6.00 % in the northern region of the country to 36.00 % in the southern region; the level is 19.00 % in the western region and 9.00 % in the central region. Even in the southern regions, wide variations can be seen among the states of Kerala, Tamil Nadu, Andhra Pradesh and Karnataka. The frequency of consanguinity varies from 52.00 % in Tamil Nadu and approximately 37.00 % in Andhra Pradesh and Karnataka to only 11.00 % in Kerala.[8]

In the western region, marriage among biological relatives has been found to be fairly common in Maharashtra (20.00%) followed by Goa (15.00%) and Gujarat (7.00%). Although consanguineous marriage in this region of the country is fairly common among all religious communities, namely Muslims, Hindus, Parses, and Christians, the strongest preference for consanguinity is seen among Muslims. The prevalence rates for the Central, Eastern and Northeastern parts of the country, are low and basically among Muslims and some minority communities.[8]

With regard to the type of consanguinity, close consanguinity is quite frequent in all regions as compared with remote consanguinity. About 29.00% of all marriages in the South India have been recorded as close consanguineous marriage. In this respect , marriage between first cousin(mostly between cross-cousin and occasionally between parallel cousins) is much more commoner than uncle-niece and second cousin marriage.[8]

Attitudes in Hinduism are divided; the Dravidian South Indians regarding consanguineous marriage are preferential whereas in North India close kin marriage is prohibited under Aryan tradition.[9]



Consanguinity and Its Effect On Fertility, Pregnancy Outcomes and Under-Five year Children.

A comparative analysis of fertility in consanguineous and non-consanguineous marriage has been conducted, based on 30 populations including 11 studies from India. At all levels of consanguinity investigated , the mean number of live births are higher in the consanguineous unions compared with marriages between non-consanguineous couples ; and in the case of first cousin marriages fertility was higher in 27 of the 30 populations investigated ($p < 0.0001$). Most studies in India have shown that early postnatal mortality is higher in the progeny of consanguineous unions at least in part to the expression of deleterious recessive genes consanguinity associated deaths are largely concentrated during the first year of life , multiple deaths have been reported in specific consanguineous families in population to their levels of parental genetic relatedness. Congenital disorders including neural tube defects and congenital heart defects are more common in consanguineous progeny .[10]

The results of review of data from 21 studies in India and Pakistan showed substantial variation in the mean fertility levels, but in most cases, mean number of live births reported by women in cousin marriage was higher than in non-consanguineous unions. In particular, women in the first cousin unions had higher mean number of live births compared to non-consanguineous couples in 19 of the 21 studies.[11]

A study was done on 1800 Qatar women aged ≥ 15 years. They found that although fertility was higher in both the groups (consanguineous and non-consanguineous), the mean number of pregnancies was some what higher in respondents with first cousin unions. Concomitantly they also had a slightly higher

rate of live births than women in non-consanguineous unions. The occurrence of asthma, mental retardation, epilepsy and diabetes was significantly more common in the off-spring of all consanguineous than non-consanguineous couples.[12]

When a study was conducted on 500 married women residing in a village of Belgaum district, consanguinity was found in 36.00 % of marriages. Muslims had higher frequency (39.40 %) than Hindus (35.70 %). Majority of the consanguineous marriages were between first cousin (54.44 %). Abortion was significantly higher in consanguineous marriage ($p < 0.001$). The study did not show significant difference in the number of still births, neonatal deaths and congenital malformations between consanguineous and non-consanguineous groups.[13]

When data was collected from 211 Kotia women residing in Vishakapatnam, consanguineous marriages made up just over a quarter of the total and of these, Father's Sister's Daughter (FSD) were more common than Mother's Brother's Daughter. The mean inbreeding co-efficient for the sample (F) was 0.0172. Women in consanguineous marriage had lower mean number of total conceptions, live births and living off-springs (net fertility) than women in non-consanguineous marriage .[14]

Another survey was conducted in South India on 377 mothers of which 156 (41.40%) were consanguineous and 221 (58.60%) were non-consanguineous. Consanguinity was more prevalent among Hindus than among Muslims or Christians. The number of pregnancies and live births were higher in consanguineous than in non-consanguineous. The mean number of living children was not significantly different in the two groups. Although the intrauterine wastage showed no significant difference between the two groups, extra uterine loss of life especially the death rate of children was higher in the consanguineous marriage .[15]

A study was conducted on 183 marriages in Southern India. Among the 183 marriages 93 (51.00%) were consanguineous. First cousin was the commonest form of consanguinity (27.00%) and uncle – niece marriage was not uncommon (11.00%). There were 3.8 pregnancies per women in non – consanguineous group and 4.2 pregnancies in the consanguineous group. This difference was not statistically significant (P = 0.21). In consanguineous group loss occurred in 10.00 % in utero and in the immediate neonatal period and in 13.40% during infancy and childhood. These differences were not statistically significant. The total fetal and child loss was 20.50% in the non-consanguineous group and 23.40 % in the consanguineous group. This was also not statistically significant (P = 0.35) .[16]

When a study was conducted on 1000 consecutive pregnant women in Pondicherry, consanguinity was found in 30.80% and majority of consanguineous marriages were between first cousin (47.40 %). The neonatal and infant mortality for the whole group were higher in consanguineous mating, compared to non-consanguineous mating. However, the difference was statistically significant only for the infant mortality (97.80 Vs 59.70 $p < 0.05$). The mean total fertility rate per couple was 2.8 in both consanguineous and non-consanguineous marriage, showing that consanguinity did not affect fertility. The frequency of illness was significantly higher in off-springs of consanguineous marriage as compared to non-consanguineous marriage (176.1 / 1000 Vs 67.2 / 1000, $p < 0.001$). Consanguineous marriage showed a higher frequency of malformations in the off-spring, compared to the non-consanguineous marriage. However, this did not reach statistical significance ($p = 0.3$).[17]

One study was conducted in Dubai and Al Ain on 2200 women aged 15 years and above. There were no significant differences in the rates of abortions, previous

still births and neonatal deaths between consanguineous and non-consanguineous mating. When diseases in the off-springs were considered it was found that 381 out of 1026 (37.60 %) and 292 out of 1007 (29.00%) consanguineous and non-consanguineous couples, respectively, had at least one child affected. The occurrence of malignant neoplasm, leukemia, congenital abnormalities, mental retardation and physical deformity was significantly more common in off-springs of consanguineous marriages.[18]

Another study was undertaken in South India. The findings of this study were that the total incidence of congenital malformations was 39.1 / 1000 births with a significantly higher incidence among the consanguineous group (8.01 %) as compared with the non-consanguineous group (2.42 %) ($p < 0.001$) . The incidence of malformations was higher in the uncle–niece mating (9.34 %) as compared with the first cousin marriage (6.18 %) ($p < 0.01$ %). Malformations of the central nervous, gastrointestinal, musculoskeletal, cardiovascular and genito-urinary systems were significantly higher in consanguineous group.[19]

Data was collected in Egypt using country's Demographic Health Survey 2000. They found that risk of infant mortality was higher in case of consanguineous couples even after controlling for selected non-genetic predictors of infant mortality. The risk of mortality was 30.00% higher and this was statistically significant in case of close consanguineous couples; it was higher by 19.00% among remote consanguineous couples but was not significant. The risk of child mortality was higher among the close consanguineous couples by 50.00 % (odds ratio = 1.52) and among remote consanguinity by 27.00 % (odds ratio =1.27) as compared to no relation couples. The effects were found statistically significant .[20]

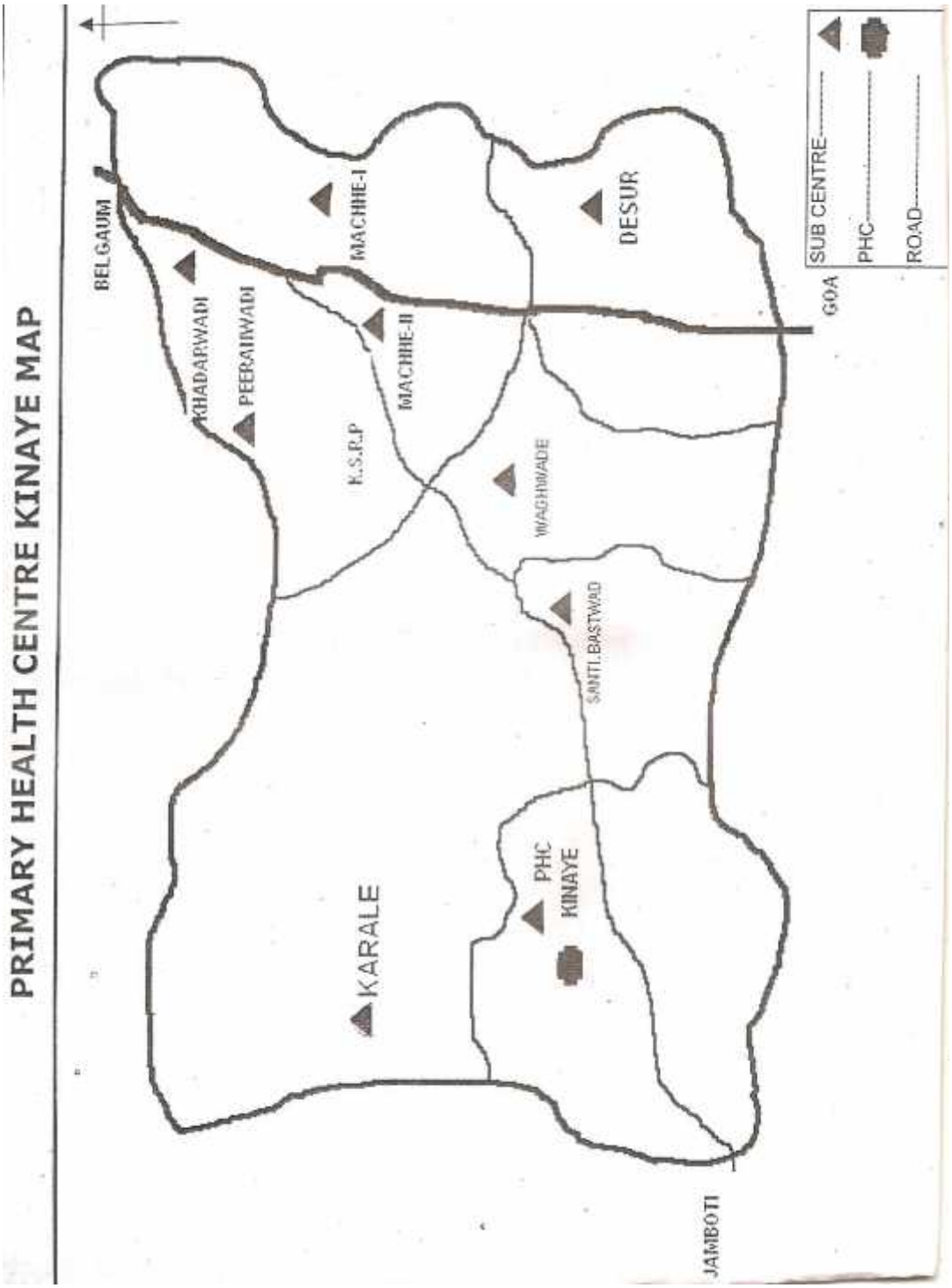
A study was conducted in North India to know the Inbreeding effects and it was observed that a total of 14 different congenital disorders were identified in the study. The incidence of congenital malformations among the consanguineous was significantly higher ($p < 0.001$) than that among the non-consanguineous marriage.[21]

A study was done in Iran and it was observed that congenital malformations were 3.5 times more common in consanguineous versus non-consanguineous marriage ($p < 0.0001$). The genito-urinary system was the most commonly affected involving 32.10 % of the 109 malformations. There were 16 (14.70%) infants with congenital heart diseases (4.53 /1000 live births). The most common anomalies were ventricular septal defect, tetralogy of fallot and endocardial cushion defect (4.70%, 1.90% and 1.80% respectively).[22]

In another study conducted to know the effects of consanguineous marriage on reproductive outcomes it was observed that the reproductive wastages showed no significant differences in frequency of abortions and still births between the three groups (first cousin, distant relatives and unrelated). This was also true for total prenatal losses (abortions + stillbirths). However, significant differences between the groups were found for infant death rates. There were a significantly higher proportion of congenital malformations as the cause of neonatal death and total wastage in the group of first cousin marriage compared to the group of unrelated parents.[23]

A survey was done in Kerala in the tribal population. The results of the study showed that perinatal mortality differentials are highly significant in the Mudugars and Irulars tribal groups. Levels of postnatal mortality in both the present tribal groups were significantly higher in the consanguineous groups, the figures being 26.23 % in Mudugars and 13.05 % in the Irulars.[24]

A few other studies have suggested that prolonged inbreeding may lead to "cleaning of the gene pool" of the lethal genes through increased rates of elimination of recessive affected off-spring by selective survival and thereby lowering the mortality differential. Also the World data of inbreeding – related mortality rates have displayed two trends, either the prenatal mortality in excess than the post natal or the other way round.[24]


PRIMARY HEALTH CENTRE KINAYE MAP
BELGAUM
KHADAPWADI
PEERAIWADI
MACHHE-I
MACHHE-II
K.S.R.P
DESUR
GOA
WAGHWADE
SANTI.BASTWAD
KARALE
PHC
KINAYE
JAMBOTI
SUB CENTRE
PHC
ROAD

METHODOLOGY

Material and Methods

The present study was a one year cross-sectional study. The study area was Khaderwadi village which is one of the villages under Primary Health Centre (PHC) Kinaye, adopted by J.N. Medical College, Belgaum.

The Khaderwadi village, where subcentre is located in this village, has a population around 3400 and it is situated 12 kilometers from J .N. Medical College towards Jamboti-Chorla road. The common languages spoken by the people in the village are Marathi and Kannada. For the health care of the villagers there are Health Care Workers – Female and Male, Anganwadi workers and Private Practioners of Indian system of medicine. For the education, the children go to the anganwadis and schools. There are 4 Anganwadis, 1 Primary school and 1 High school in the village.

Study Period

It is a one year cross-sectional study from 1st January 2008 to 31st December 2008 . A pilot study was conducted on 20 married women and their under –five year children, after obtaining informed consent (Annexure I), with pre-designed proforma with structured questionnaire (Annexure II). After analysis of the pilot study, the proforma was modified accordingly.

Sample Size

Total population of Khaderwadi village was 3400

Taking sex ratio as 933 : 1000

$$\text{Women population} = \frac{933 \times 3400}{1933}$$

$$= \quad 1641 \approx 1650$$

65 % of 1650 are women above 15 years

$$65\ \%\ \text{of}\ 1650 \quad = \quad 1072.5$$
$$\approx \quad 1080$$

70 % of 1080 are married = 756 married women.

Children: 14 % of the total population was under - five year children

$$= \frac{3400 \times 14}{100} = 476$$

Estimated sample size of the all married women = 756

Estimated sample size of the under–five children = 476

Inclusion Criteria

1) Married women including widows who are residing more than one year in the study area.
2) Children less than 5 years who are residing more than one year in the study area.

Exclusion Criteria

Married women and their children more than five year who are residing less than one year in the study area.

Data Collection Tools

A predesigned and pretested structured questionnaire (Annexure II) was prepared and administered to eligible women by house to house survey. The married women were interviewed in their home and the proforma was filled regarding the age, religion, education, occupation, number of males, females, under- five year children,

socio-economic status, consanguinity type, reasons for consanguineous marriage , family planning practices and pregnancy outcomes were collected using pre-designed questionnaire. Detailed clinical examination of their under-five year children was done to assess the health status and presence of any congenital malformations. Data was also collected from medical records. Reasons for neonatal, infant and under-five year deaths were collected based on history given by the mother.

Data Analysis

Codes were prepared for each options of the questionnaire. Data was entered in Excel sheet to prepare master chart. SPSS software was used for analysis of the data. Tables and graphs were prepared by using Microsoft Windows 2007 software. The prevalence of consanguineous marriage and different diseases among children below five years was computed. The data was analyzed using proportions, percentages, Chi-square test and Fisher exact test.

Definition of Variables

Age - Age was recorded to the nearest completed years.

Educational status

- Illiterate - A person aged more than 7 years who cannot read and write.
- Primary school – Person who has studied from 1^{st} to 7^{th} standard.
- High school – Person who has studied 8^{th} to 10^{th} standard.
- Pre-university / Diploma – Person who has studied up to PUC 2^{nd} year or a diploma course.
- Graduation – Person who has obtained any degree.

Occupation

- Agricultural labourer – A person who works in farm field.
- Housewife – A woman who takes care of the household day to day duties.
- Factory worker – A person who works in a small or large scale industry.
- Coolie – A person who makes living on daily wage bases.
- Any other Profession – A person who is employed in any profession other than these like shop owner, tailor, clerk etc.

Socio-economic status:

Information regarding per capita income (in Rupees / month) was collected and socio-economic status was classified using Modified B G Prasad's classification for the study period (2008-09) and it was calculated by Multiplication factor (2008-09) with 1961 Prasad's classification values.[25]

Social-economic class.	**Prasad's classification 1961 (per capita income in Rs/month)**	**Modified Prasad's classification In study period 2008-09 (per capita income in Rs/month)**
I	100 and above	2166 and above.
II	50—99	1083 – 2165
III	30-49	650 – 1082
IV	15-29	325 – 649
V	<15	below 325

Average consumer price index for year 2008 - 09 = 439.33 [26]

Modification was done with aid of multiplication factor (M.F), which was obtained as below:

$$M.F. = \frac{\text{Average consumer price index for the study period (2008-09)}}{100} \times 4.93$$

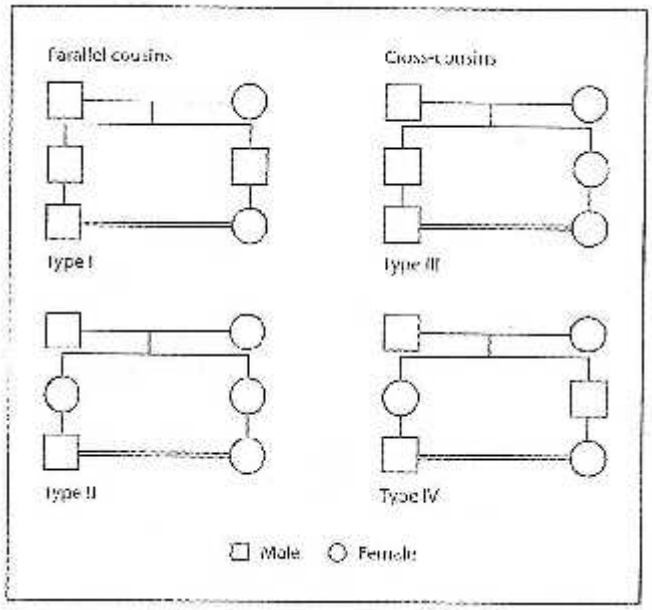
$$= 439.33 / 100 \times 4.93 = 21.66$$

Consanguineous Marriage: According to WHO, a consanguineous is defined as a marriage between people who are second cousin or more related.

Marriages were classified into four types

- Spouses who were first cousin (Cross Cousin) – a man marrying his Mother's brother's daughter or Father's sister's daughter.
- Parallel Cousin – a man marrying Mother's sister's daughter or Father's brother's daughter.
- Spouses related closer than first cousin mainly Uncle-Niece.
- Spouses whose relationship was beyond first cousin were designated as Others.
- Spouses who were not related to each other before marriage were designated as Non-Consanguineous.

Types of first –cousin marriages[28]



Patterns of Consanguinity[27]

Relationship (between shaded individuals)	*Degrees of consanguinity*
Sibs	First
Parent-child	First
Uncle (aunt) – (niece) Nephew	Second
Half-Sibs	Second
First cousins	Third

Abortion – Termination of pregnancy before the period of viability which is considered to occur at 28th week.

Still Birth – A birth of a newborn after 28th completed weeks

(Weighting 1000 grams or more) when the baby does not breath or show signs of life after delivery.

Neonatal Death – Deaths occurring during the neonatal period, commencing at birth and ending 28 completed days after birth.

Infant Death – Death of child less than 1 year of age.

Under Five Year Death – Death of children aged under-five years.

Morbidity – Any departure, subjective or objective, from a state of physiological well-being.

Fertility – The ability of man and woman to reproduce.

Photograph 1: View of Study Area

Photograph 2: Interviewing married woman

Photograph 3: Examining health status of under five year child

Photograph 4: Interviewing married woman and examining health status of under five year child

RESULTS

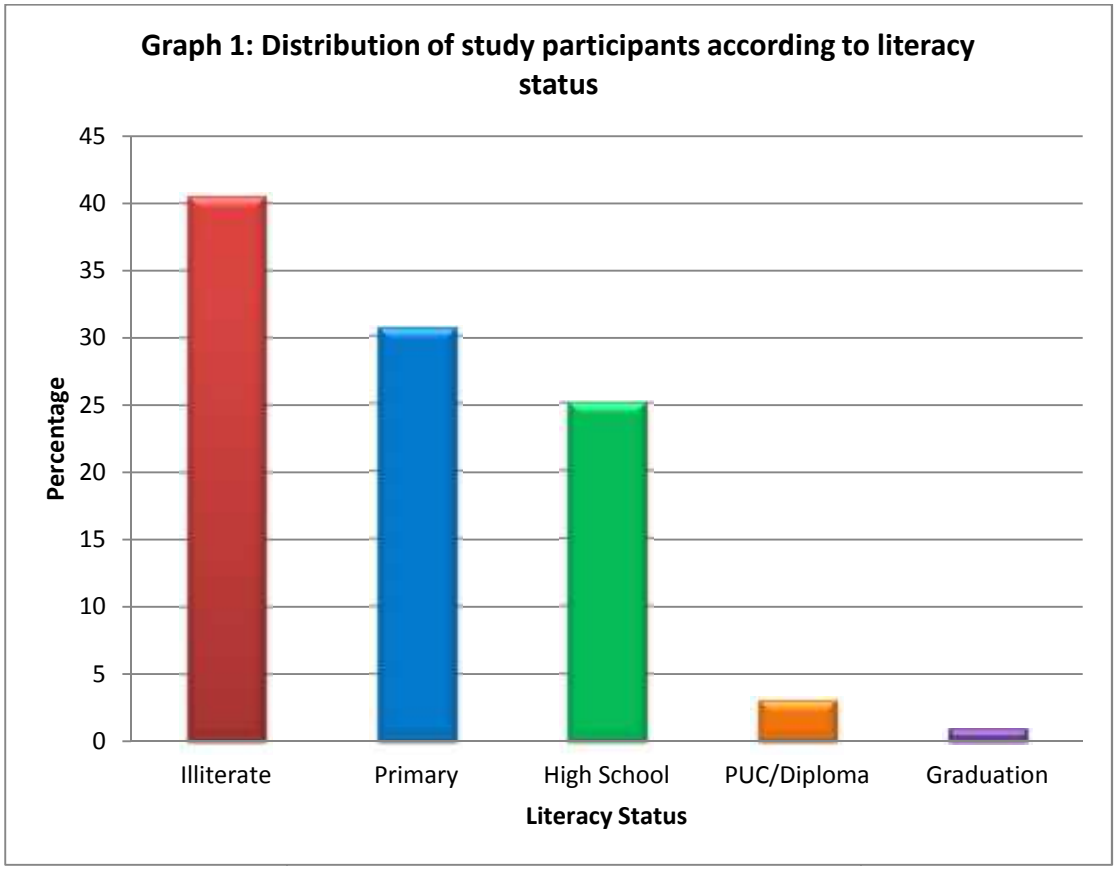
Table 1: Age distribution of study participants

Age in years	Number	Percentage
<19	38	5.03
20-29	185	24.50
30-39	167	22.12
40-49	149	19.74
50-59	90	11.93
>60	126	16.68
Total	**755**	**100.00**

In our study, among 755 married women 38 (5.03%) were <19 years, 539 (71.39%) were in the reproductive age group of 15-49 years and 126 (16.68%) were above the age of 60 years.

Table 2: Distribution of study participants according to literacy status

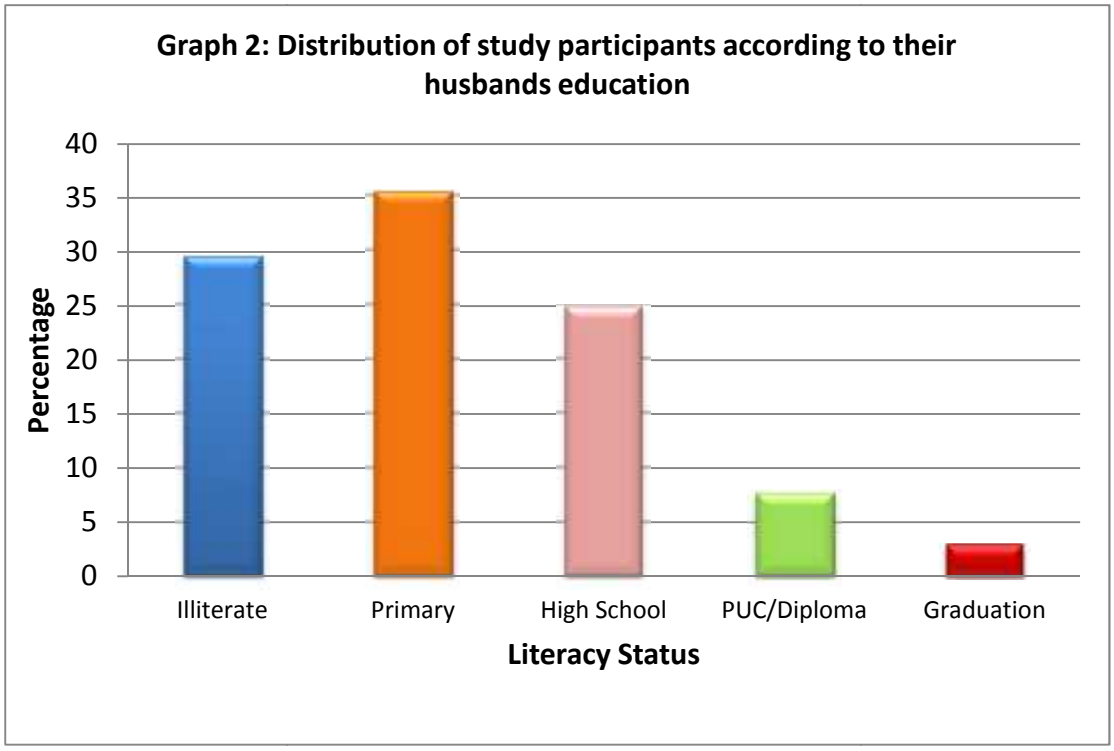
Literacy status	Number	Percentage
Illiterate	306	40.52
Primary	231	30.61
High school	189	25.03
PUC College/Diploma	23	3.05
Graduation	06	0.79
Total	**755**	**100.00**



The literacy status of our study participants showed that 231 (30.61%) had studied till primary level, 189 (25.03%) upto high school level, 23 (3.05%) upto PU College/Diploma, only 6 (0.79%) were graduates and remaining 306 (40.52%) were illiterates.

Table 3: Distribution of study participants according to their husbands education

Literacy status	Number	Percentage
Illiterate	222	29.41
Primary	267	35.37
High school	187	24.76
PUC College/Diploma	58	7.68
Graduation	21	2.78
Total	**755**	**100.00**



In our study, 222 (29.41%) husbands of the participants were illiterates and 533 (70.59 %) were literates ,out of which 267 (35.37%) had studied upto primary level,187(24.76%) upto high school level, 58 (7.68%) upto PUC college/Diploma and 21 (2.78%) had graduated.

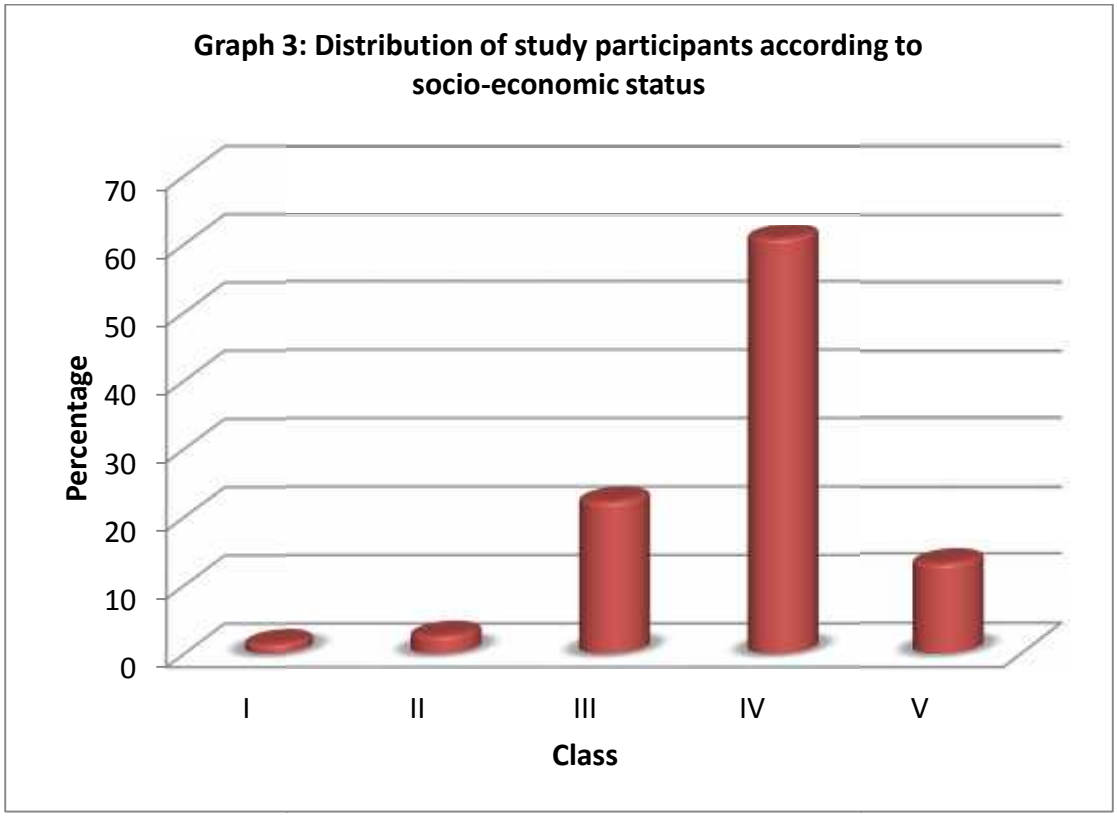
Table 4: Distribution of study participants according to occupation

Occupation	Number	Percentage
House wife	490	64.91
Agricultural labours	188	24.91
Factory workers	44	5.82
Coolies	05	0.65
Others	28	3.71
Total	**755**	**100.00**

In this study, 490 (64.91%) were housewives and 265 (35.09%) were employed. Among the employed women, 188 (24.91%) were agricultural labours, 44 (5.82%) factory workers, 5(0.65%) coolies and remaining 28 (3.71%) were other workers like shop owners , tailors, clerks etc.

Table 5: Distribution of study participants according to socio-economic status

Class (per capita per month in Rupees)	Number	Percentage
Class I (2166 and above)	11	1.46
Class II(1083 – 2165)	20	2.65
Class III(650 – 1082)	168	22.25
Class IV(325 – 649)	458	60.66
Class V(below 325)	98	12.98
Total	**755**	**100.00**



A majority 458 (60.66%) participants belonged to Class IV Socio-economic status in our study.

Table 6: Distribution of study participants according to type of family

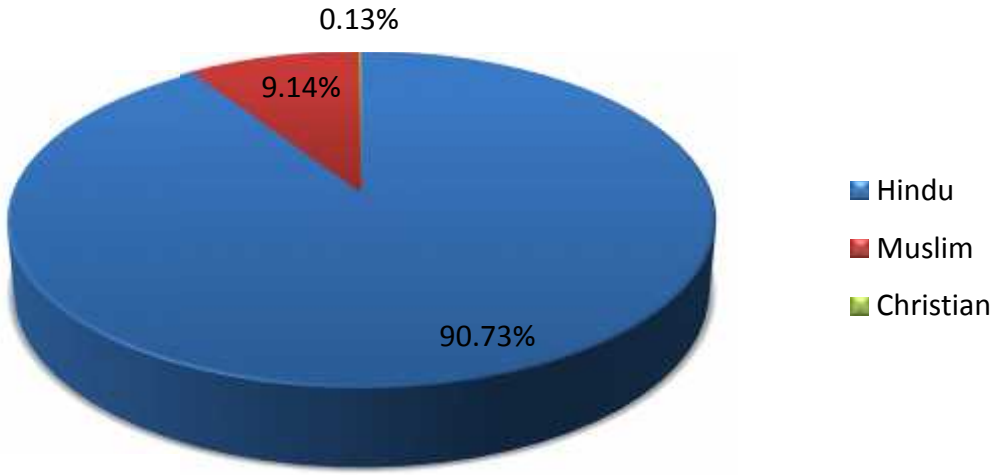
Family Type	Number	Percentage
Nuclear	335	44.37
Joint	402	53.25
Three-Generation	10	1.33
Broken	08	1.05
Total	**755**	**100.00**

In the present study, majority 402 (53.25%) lived in joint family followed by 335 (44.37%) in nuclear family; broken and three generation family was seen in 18(2.38%) of the participants.

Table 7: Distribution of study participants according to religion

Religion	Number	Percentage
Hindu	685	90.73
Muslim	69	9.14
Christian	01	0.13
Total	**755**	**100.00**

Graph 4: Distribution of study participants according to religion



In this study , majority 685 (90.73%) were Hindus , 69 (9.14%) were Muslims and only 1 (0.13%) participant was Christian.

Table 8: Distribution of study participants according to age at marriage

Age in years	Number	Percentage
10-19	577	76.42
20-29	178	23.58
Total	**755**	**100.00**

In this study, 577 (76.42%) of the study participants were married in the age group of 10-19 years.

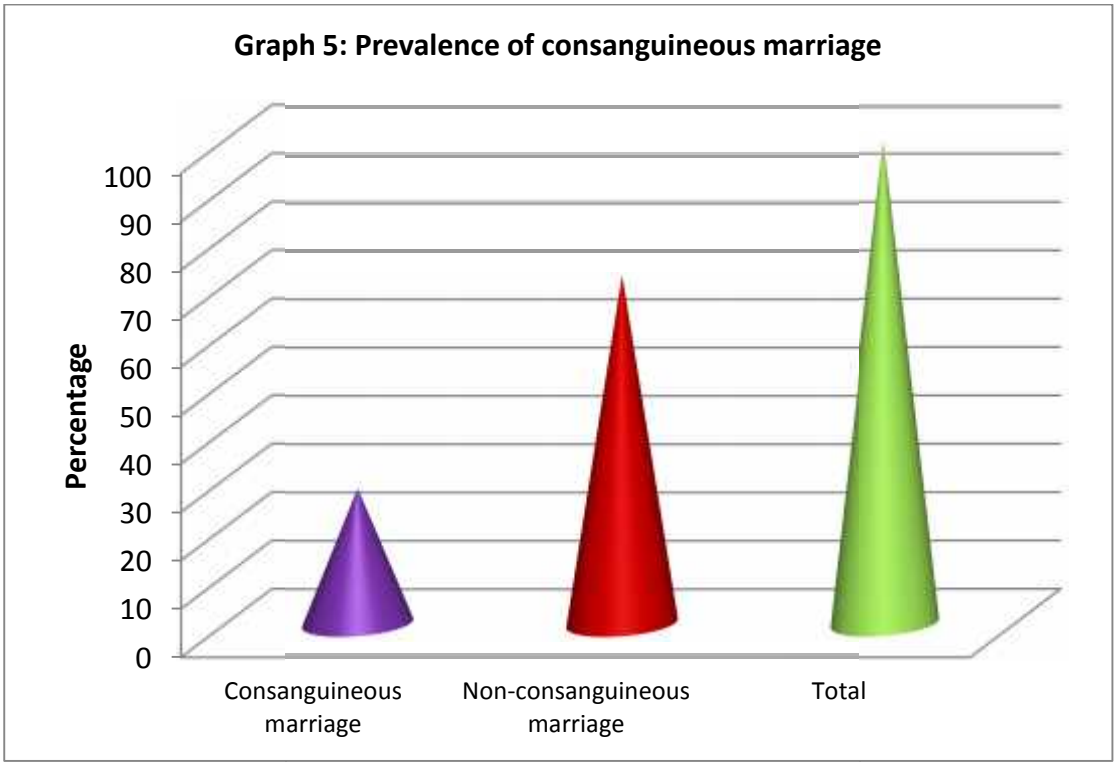
Table 9: Distribution of study participants according to age at marriage of their husbands

Age in years	Number	Percentage
10-19	176	23.31
20-29	572	75.76
30-39	07	0.93
Total	**755**	**100.00**

In our study, majority 572 (75.76%) husbands of the participants were married in the age group of 20-29 years.

Table 10: Prevalence of consanguineous marriage

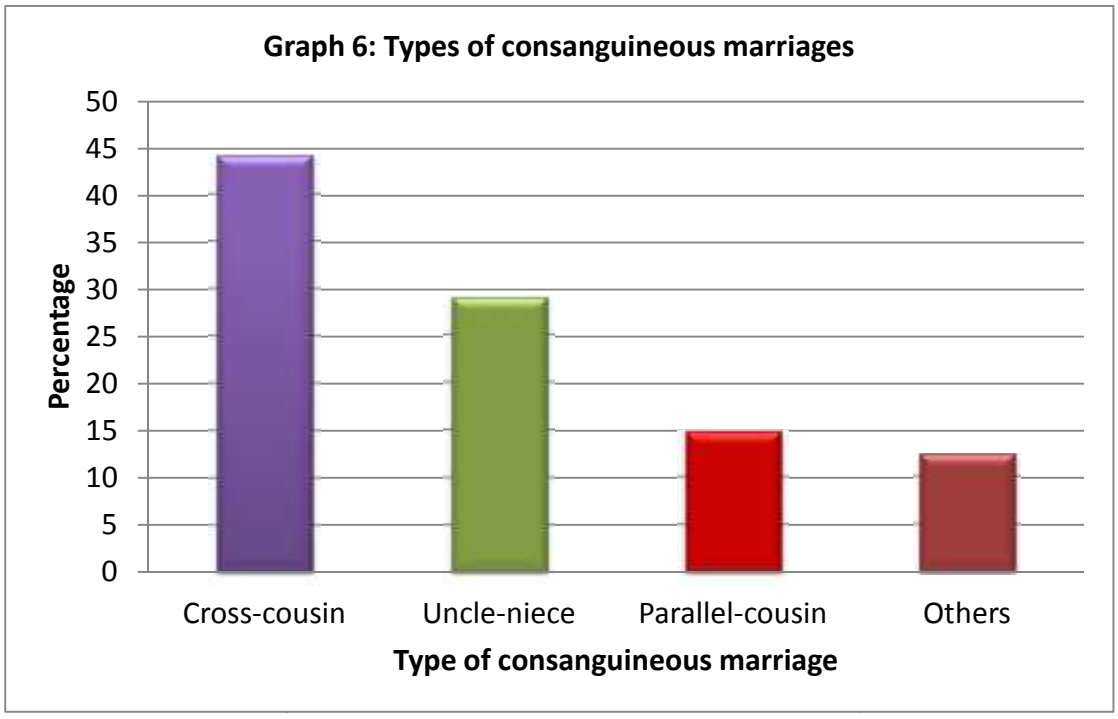
Consanguineous marriage		Non-consanguineous marriage		Total	
Number	**Percentage**	**Number**	**Percentage**	**Total number**	**Percentage**
211	27.94	544	72.06	755	100



In our study, out of 755 married women 211 were in consanguineous marriage and 544 in non-consanguineous marriage. Therefore, the prevalence of consanguineous marriage was 27.94%.

Table 11: Types of consanguineous marriages

Type of consanguineous marriage	No. of women	Percentage
Cross-cousin	93	44.08
Uncle-niece	61	28.90
Parallel-cousin	31	14.69
Others	26	12.33
Total	**211**	**100.00**



In our study, the most common type 93(44.08%) of marriage was between cross-cousin followed by uncle-niece 61 (28.90%), 31 (14.69%) between parallel-cousin and remaining 26 (12.33%) were other than these types of marriages.

Table 12: Distribution of married women according to degree of consanguinity

Degree of consanguinity	No. of women	%
1st degree	00	00.00
2nd degree	61	28.90
3rd degree	124	58.77
Beyond 3rd degree	26	12.33
Total	**211**	**100.00**

In our study, 124 (58.77%) had 3rd degree of consanguinity followed by 61 (28.90%) 2nd degree and 26 (12.33%) were beyond 3rd degree. None of the participants in our study had 1st degree of consanguinity as it is not practiced in a highly respectable religious country like ours.

Table 13: Distribution of study participants according to various reasons for consanguineous marriage

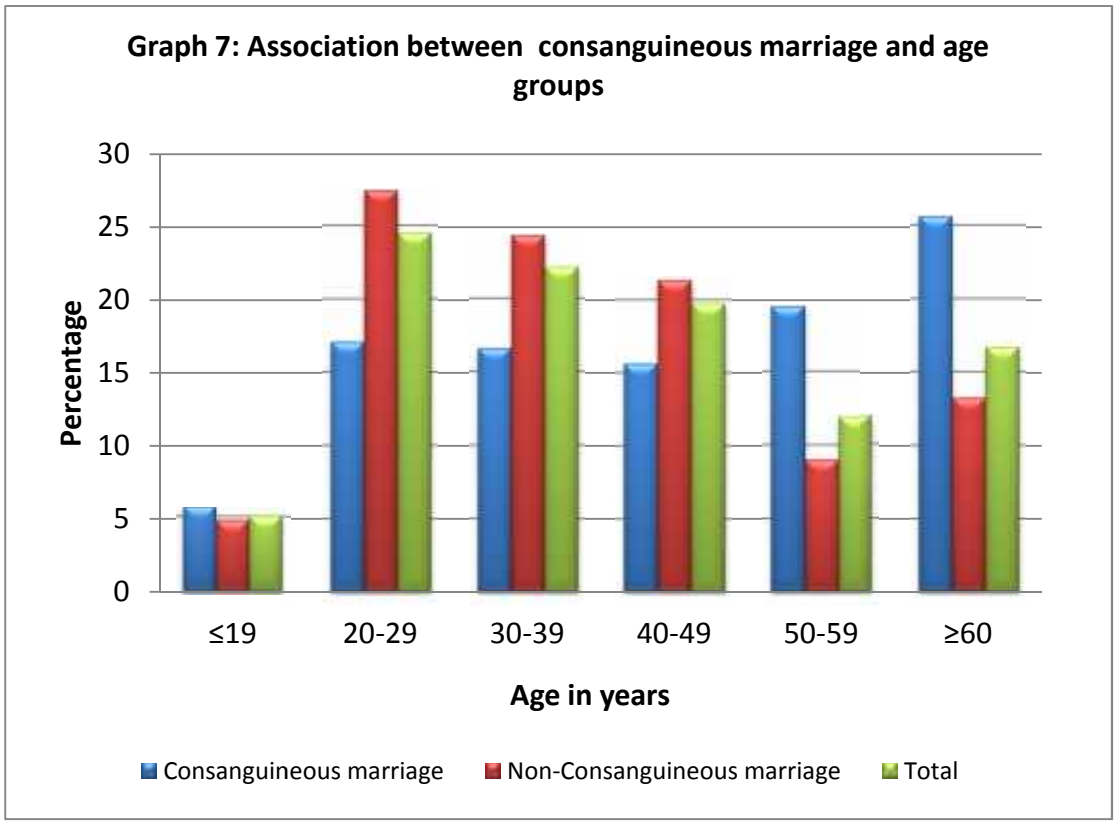
Reasons	Total number	Percentage
1) Preference of mates within kin group	60	28.43
2) Preference of mates within kin group and greater marriage stability	36	17.06
3) Strong family tradition and greater marriage stability	18	8.54
4) Strengthening of ties and strong family tradition	16	7.58
5) Preference of mates within kin group and strong family tradition	12	5.69
6) Strengthening of ties and greater marriage stability	11	5.21
7) Strong family tradition	9	4.26
8) Greater marriage stability	8	3.79
9) Strengthening of ties, preference of mates within kin group and strong family tradition	7	3.32
10) Other combined reasons together	34	16.12
Total	**211**	**100.00**

In our study, the most common reason for consanguineous marriage was preference of mates within kin group 60 (28.43%) followed by preference of mates within kin group and greater marriage stability observed in 36 (17.06%) of participants.

Table 14: Association between consanguineous marriage and age groups

Age in years	Consanguineous marriage		Non-Consanguineous marriage		Total number	Percentage
	Number	Percentage	Number	Percentage		
≤19	12	5.69	26	4.77	38	5.03
20-29	36	17.06	149	27.39	185	24.50
30-39	35	16.59	132	24.27	167	22.12
40-49	33	15.64	116	21.33	149	19.74
50-59	41	19.43	49	9.00	90	11.93
≥60	54	25.59	72	13.24	126	16.68
Total	**211**	**100.00**	**544**	**100.00**	**755**	**100.00**

$\chi^2 = 41.175$ DF = 5 p = 0.000

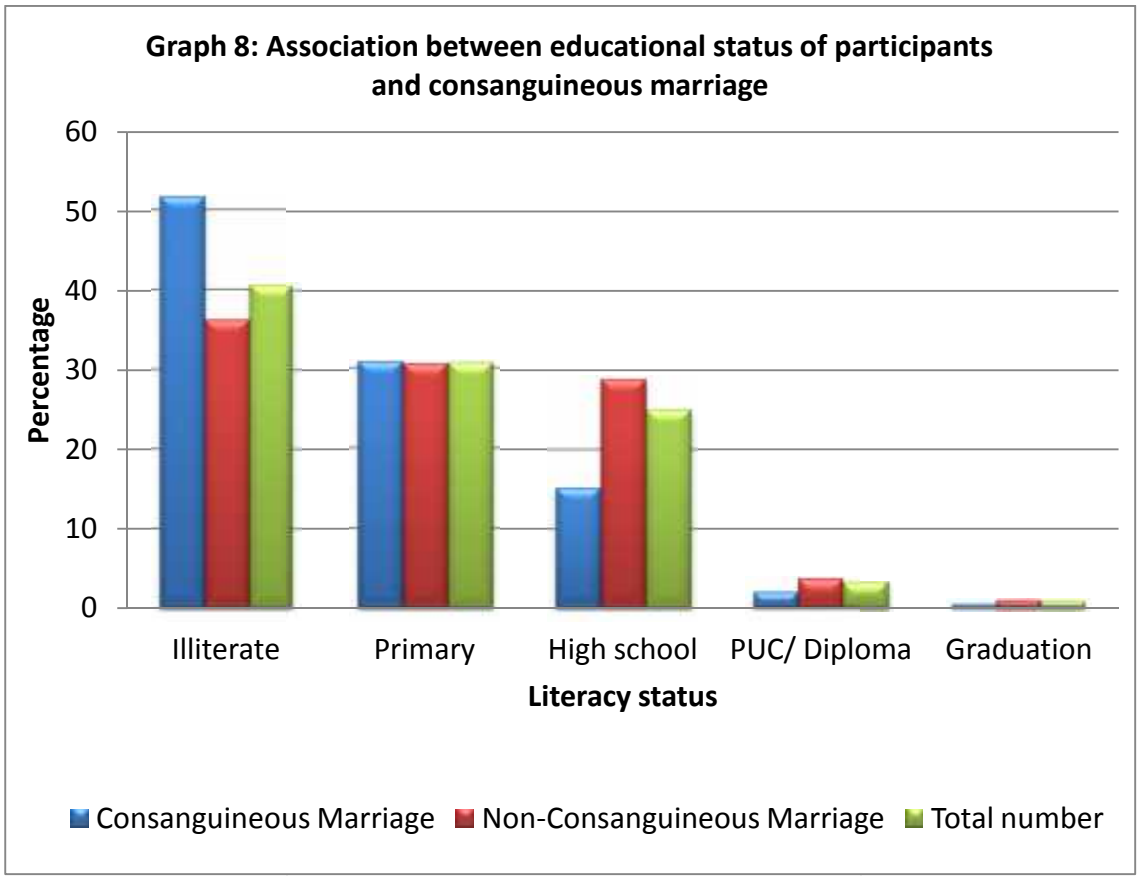


In our study, significant association was found between age of study participants and consanguinity. Consanguinity was observed to be highest 95 (45.02%) among women above the age of 50 years and least 12 (5.69%) among women ≤19 years. Majority of the study participants belonging to consanguineous 116(54.97%) and non-consanguineous marriage 423(56.02%) were in the reproductive age group of 15-49 years.

Table 15: Association between educational status of participants and consanguineous marriage

Literacy status	Consanguineous Marriage		Non-Consanguineous Marriage		Total number	Percentage
	Number	Percentage	Number	Percentage		
Illiterate	109	51.66	197	36.21	306	40.52
Primary	65	30.81	166	30.51	231	30.61
High school	32	15.17	157	28.87	189	25.03
PUC College/ Diploma	04	1.89	19	3.50	23	3.05
Graduation	01	0.47	05	0.91	06	0.79
Total	**211**	**100.00**	**544**	**100.00**	**755**	**100.00**

$\chi^2 = 21.994$ DF = 4 p = 0.000

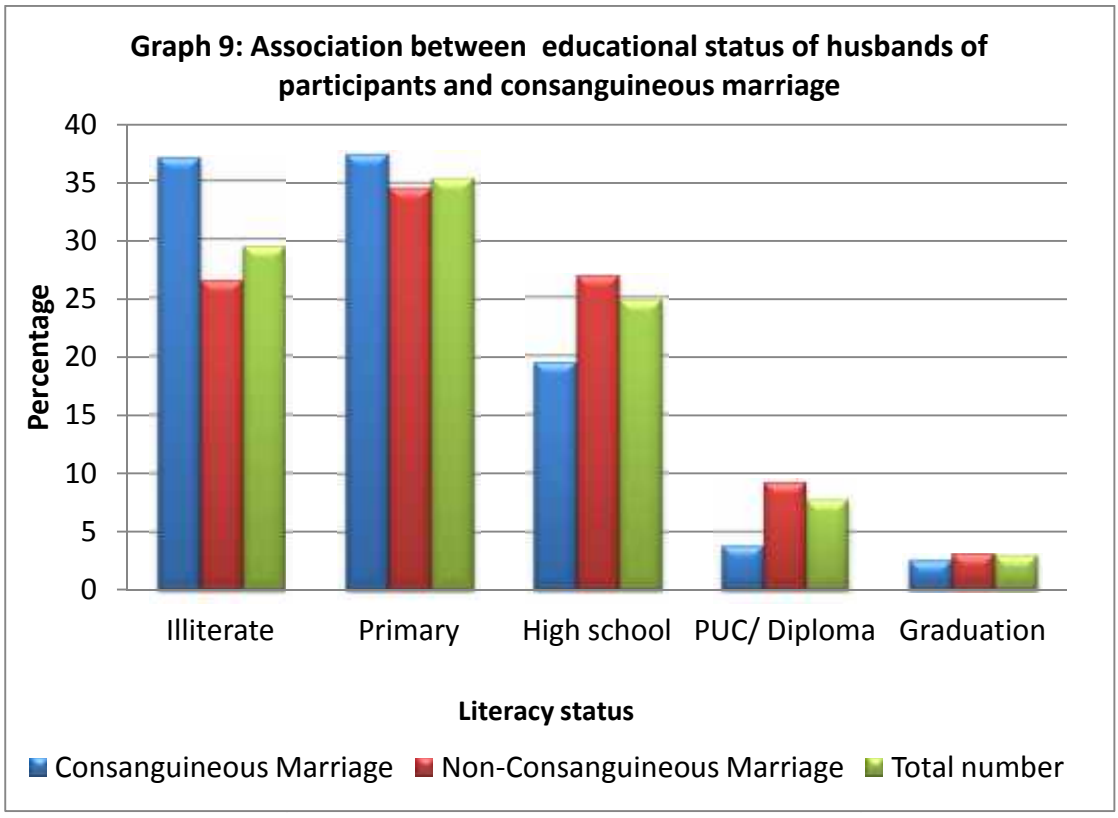


In our study, significant association was observed between education of the women and consanguinity. Consanguinity was higher among illiterate women 109 (51.66 %) compared to women in non –consanguineous marriage 197 (36.21%).

Table 16 : Association between educational status of husbands of participants and consanguineous marriage

Literacy status	Consanguineous Marriage		Non-Consanguineous Marriage		Total number	Percentage
	Number	Percentage	Number	Percentage		
Illiterate	78	36.97	144	26.47	222	29.41
Primary	79	37.44	188	34.55	267	35.37
High school	41	19.43	146	26.84	187	24.76
PUC College/ Diploma	08	3.79	50	9.19	58	7.68
Graduation	05	2.37	16	2.95	21	2.78
Total	**211**	**100.00**	**544**	**100.00**	**755**	**100.00**

$\chi^2 = 15.370$ DF = 4 p = 0.004



In our study, 78 (36.97%) husbands of participants in consanguineous and 144 (26.47%) in non-consanguineous marriages were illiterates. Majority of the husbands in both consanguineous 79 (37.44%) and non-consanguineous marriages 188 (34.55%) had studied till primary level of education. A significant association was observed between education of husbands of participants and consanguinity.

Table 17: Association between family type of participants and consanguineous marriage

Family type	Consanguineous Marriage		Non-Consanguineous Marriage		Total number	Percentage
	Number	Percentage	Number	Percentage		
Nuclear	90	42.65	245	45.03	335	44.37
Joint	116	54.98	286	52.57	402	53.25
Three-generation	03	1.42	07	1.30	10	1.33
Broken	02	0.95	06	1.10	08	1.05
Total	**211**	**100.00**	**544**	**100.00**	**755**	**100.00**

$\chi^2 = 0.415$ DF = 3 p = 0.937

In our study, among consanguineous marriage 116 (54.98%) belonged to joint family, 90 (42.65%) nuclear family, 3 (1.42%) three generation and 2 (0.95%) to broken family. Whereas, in non - consanguineous marriage 286 (52.57%) belonged to joint family, 245 (45.03%) nuclear family, 7 (1.30%) three generation and 6 (1.10%) to broken family. However, no association was observed between type of family and consanguinity.

Table 18: Association between socio-economic status of participants and consanguineous marriage

Class	Consanguineous Marriage		Non-Consanguineous Marriage		Total number	Percentage
	Number	Percentage	Number	Percentage		
I	01	0.47	10	1.84	11	1.46
II	06	2.84	14	2.54	20	2.65
III	48	22.75	120	22.02	168	22.25
IV	132	62.56	326	60.00	458	60.66
V	24	11.38	74	13.60	98	12.98
Total	**211**	**100.00**	**544**	**100.00**	**755**	**100.00**

$\chi^2 = 2.772$ DF = 4 p = 0.597

According to modified BG Prasad's classification of socio-economic status, consanguinity was higher 132 (62.56%) among married women belonging to Class IV. Similarly, majority 326 (60.00%) of married women in non-consanguineous belonged to Class IV. Our study, however, showed no association between consanguineous marriage and socio-economic status.

Table 19: Association between religion of participants and consanguineous marriage

Religion	Consanguineous Marriage		Non-Consanguineous Marriage		Total Number	Percentage
	Number	Percentage	Number	Percentage		
Hindu	176	83.42	509	93.56	685	90.73
Muslim	35	16.58	34	6.25	69	9.14
Christian	0	0.0	01	0.19	01	0.13
Total	**211**	**100.00**	**544**	**100.00**	**755**	**100.00**

$\chi^2 = 19.893$ DF = 2 p = 0.000

In our study, among the consanguineous marriage, 176(83.42%) were Hindus, 35(16.58%) were Muslims. In the non-consanguineous marriage 509(93.56%) were Hindus, 34(6.25%) were Muslims and only 1(0.19%) participant was Christian. A significant association was observed between Muslim religion and consanguineous marriage.

Table 20: Association between religion and types of consanguineous marriages

Religion	First Cousin		Uncle-Niece		Others		Total	%
	Number	%	Number	%	Number	%		
Hindu	93	75.00	61	100.00	22	84.61	176	83.41
Muslim	31	25.00	0	0.00	04	15.39	35	16.59
Total	**124**	**100.0**	**61**	**100.0**	**26**	**100.00**	**211**	**100.00**

$\chi^2 = 18.500$ DF = 2 p = 0.000

Among Hindus, first cousin 93(75.00%), uncle-niece 61(100.00%) and other marriages 22(84.61%) were more common compared to first cousin 31(25.00%), and other marriages 4 (15.39%) in Muslim. Thus, a significant association was observed between type of consanguinity and religion.

Table 21: Association between age at marriage of participants and consanguineous marriage

Age in years	Consanguineous Marriage		Non-Consanguineous Marriage		Total number	Percentage
	Number	Percentage	Number	Percentage		
10-19	170	80.56	407	74.82	577	76.42
20-29	41	19.44	137	25.18	178	23.58
Total	**211**	**100.00**	**544**	**100.00**	**755**	**100.00**

$\chi^2 = 2.792$ DF=1 p = 0.095

In our study, majority 577 (76.42%) of the study participants were married in the age group of 10-19 yrs, in both consanguineous marriage (80.56%) and non-consanguineous marriage (74.82%) . However, no significant association was observed between age at marriage of women and consanguinity.

Table 22 : Association between age at marriage of husbands of participants and consanguineous marriage

Age in years	Consanguineous Marriage		Non-Consanguineous Marriage		Total Number	Percentage
	Number	Percentage	Number	Percentage		
10-19	61	28.90	115	21.14	176	23.31
20-29	148	70.15	424	77.94	572	75.76
30-39	02	0.95	05	0.92	07	0.93
Total	**211**	**100.00**	**544**	**100.00**	**755**	**100.00**

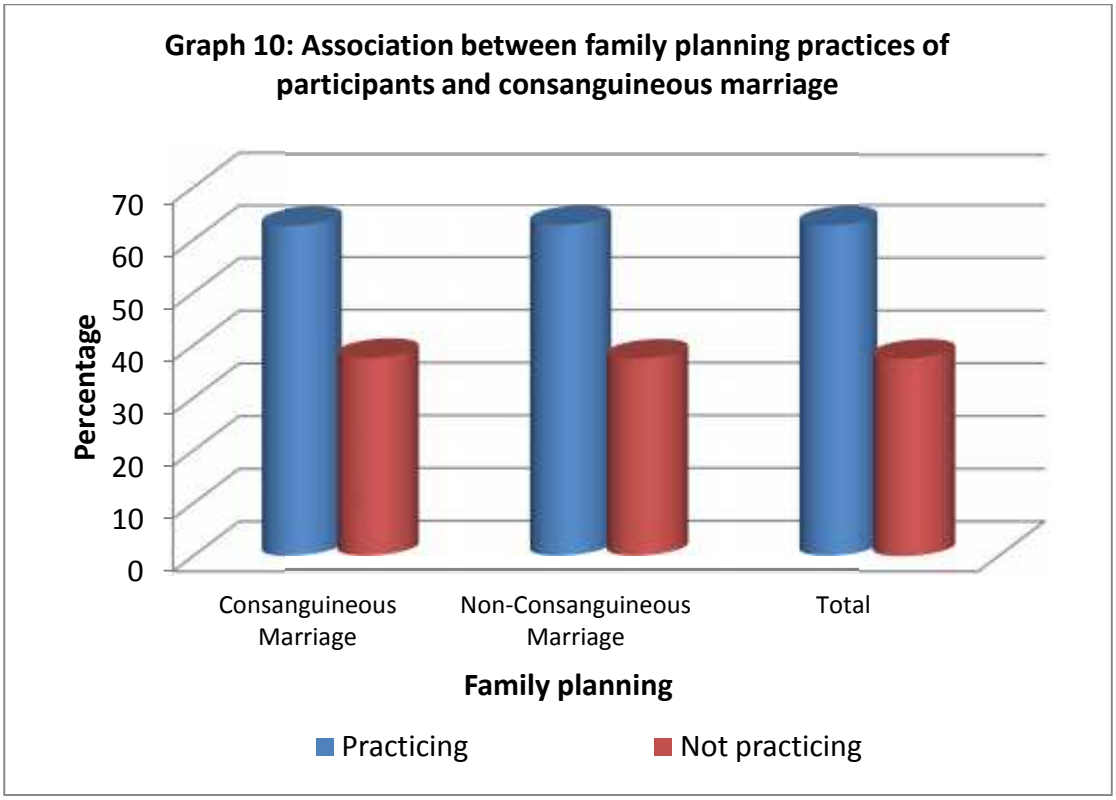
$\chi^2 = 5.160$ DF = 2 p = 0 .076

Majority of the husbands of participants in both consanguineous 148 (70.15 %) and non-consanguineous marriage 424 (77.94 %) were married in the age group of 20-29 years. Our study did not show any significant association between age at marriage of husbands of participants and consanguinity.

Table 23: Association between family planning practices of participants and consanguineous marriage

Family planning	Consanguineous Marriage		Non-Consanguineous Marriage		Total number	Percentage
	Number	Percentage	Number	Percentage		
Practicing	132	62.55	341	62.68	473	62.54
Not practicing	79	37.45	203	37.32	283	37.46
Total	**211**	**100.00**	**544**	**100.00**	**755**	**100.00**

$\chi^2 = 0.001$ DF = 1 p = 0.975

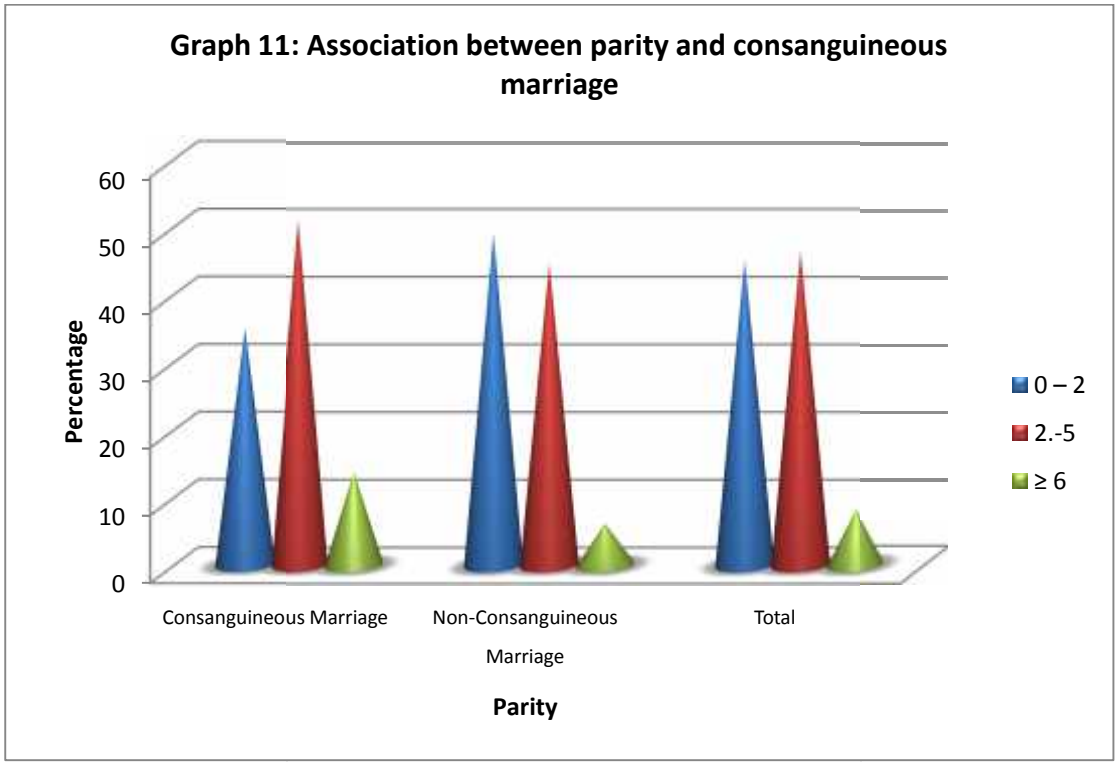


In this study, majority of married women in both consanguineous 132 (62.55%) and non-consanguineous marriage 341 (62.68%) were practicing any type of family planning methods. However, no association was observed between family planning practices and consanguinity.

Table 24 : Association between parity and consanguineous marriage

Parity	Consanguineous Marriage		Non-Consanguineous Marriage		Total number	Percentage
	Number	Percentage	Number	Percentage		
0 – 2	74	35.07	267	49.08	341	45.16
2 - 5	108	51.18	243	44.67	351	46.49
≥ 6	29	13.75	34	6.25	63	8.35
Total	211	100.00	544	100.00	755	100.00

$\chi^2 = 18.288$ DF = 2 p = 0.000



In the present study, parity ≥ 6 was higher among married women 29 (13.75%) in consanguineous marriage compared to non-consanguineous marriage where it was 34 (6.25%). This difference was found to be statistically significant.

Table 25: Mean number of pregnancies (fertility pattern) among participants

Consanguineous Marriage	Non-Consanguineous Marriage
3.6 ± 2.05	2.9 ± 1.672

T = 4.957 DF = 753 p = 0.00

In our study, significantly higher mean number of pregnancies was seen in consanguineous when compared to women in non-consanguineous marriage.

Table 26: Association between pregnancy outcomes and consanguineous marriage

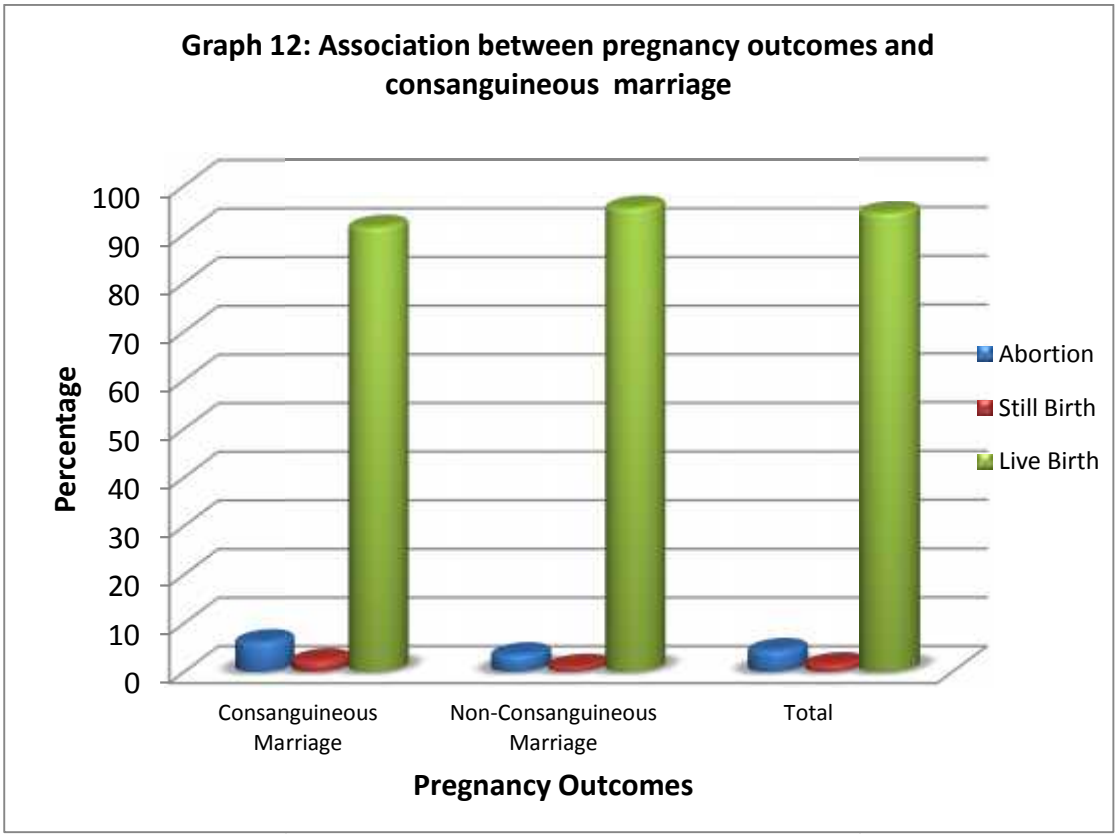
Pregnancy Outcome	Consanguineous Marriage		Non-Consanguineous Marriage		Total Number	Percentage
	Number	Percentage	Number	Percentage		
Abortion	48	6.25	57	3.57	105	4.45
Still Birth	18	2.33	17	1.06	35	1.48
Live Birth	704	91.42	1520	95.37	2224	94.07
Total	**770**	**100.00**	**1594**	**100.00**	**2364**	**100.00**

$\chi^2 = 14.776$ DF = 2 p = 0.001

Z = 2.96 p = 0.003

Z = 2.39 p = 0.0017

Z = 3.81 p = 0.000



In the present study, significant association was observed between consanguinity and pregnancy outcomes. The total number of pregnancies in consanguineous marriage was 770 out of which 48 (6.25%) had abortions, 18 (2.33%) still births and 704 (91.42%) live births. In non-consanguineous marriage the total number of pregnancies were 1594 out of which 57 (3.57%) had abortions, 17 (1.06%) still births and 1520 (95.37%) live births.

Table 27: Association between pregnancy outcomes and types of consanguineous marriages

Pregnancy outcome	First-cousin		Uncle-niece		Others		Total Number	%
	Number	%	Number	%	Number	%		
Abortion	25	5.42	17	7.92	06	6.38	48	6.24
Still birth	09	1.95	07	3.25	02	2.14	18	2.33
Live birth	427	92.63	191	88.83	86	91.48	704	91.43
Total pregnancies	**461**	**100.00**	**215**	**100.00**	**94**	**100.00**	**770**	**100.00**

$\chi^2 = 2.771$ DF = 4 p = 0.597

In this study, the number of abortions in first-cousin, uncle-niece and others were 25(5.42%), 17(7.92%) and 6(6.38%) respectively. Similarly, 9(1.95%), 7(3.25%) and 2(2.14%) still births were observed in first-cousin, uncle-niece and others respectively. Also, the number of live births in first-cousin, uncle-niece and others were 427(92.63%), 191 (88.83%) and 86(91.48%) respectively. However, no significant association was observed between types of consanguineous marriages and pregnancy outcomes.

Table 28: Causes of abortions in consanguineous and non-consanguineous marriages

Causes	Consanguineous Marriage		Non-Consanguineous Marriage		Total number	%
	Number	%	Number	%		
Fall / accident	01	2.08	02	3.50	03	2.86
Stress (lifting of heavy weight)/Travel	02	4.16	06	10.53	08	7.62
Congenital anomalies	11	22.92	05	8.78	16	15.23
Unknown reason	34	70.84	44	77.19	78	74.29
Total	**48**	**100.00**	**57**	**100.00**	**105**	**100.00**

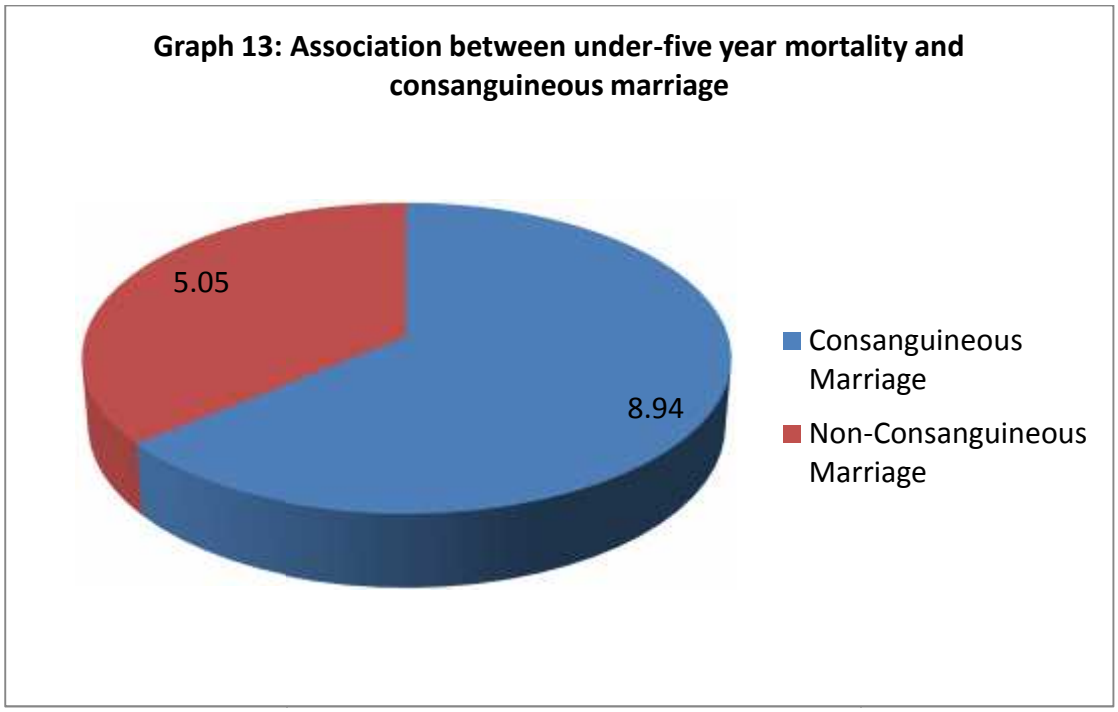
In the present study, majority 78 (74.29%) of the study participants did not know the reason for abortions in both consanguineous and non-consanguineous marriages. Congenital anomalies were higher 11(22.92%) in consanguineous marriage compared to non-consanguineous marriage 5 (8.78%).

On further analysis, none of the study participants knew the reasons for still births.

Table 29: Association between under-five year mortality and consanguineous marriage

Under-five year Mortality	Consanguineous Marriage		Non-Consanguineous Marriage	
	704 Live births	63 (8.94%)	1520 Live births	77 (5.05%)

$\chi^2 = 12.299$ DF = 1 p = 0.000



In our study, significantly higher 63 (8.94%) number of under five mortality was seen in children in consanguineous marriage compared to 77 (5.05%) in non-consanguineous marriages.

Table 30: Pattern of under-five children mortality

Pattern of under-five year mortality				
	Consanguineous marriage		**Non-Consanguineous marriage**	
	Number	**Percentage**	**Number**	**Percentage**
Neonatal Mortality	36	57.14	37	48.05
Infant Mortality	16	25.40	22	28.57
1-5 years Death	11	17.46	18	23.38
Total	**63**	**100.00**	**77**	**100.00**

$\chi^2 = 1.263$ DF = 2 p = 0.532

Z = 1.07 p =0.284

Z = 0.42 p =0.42

Z = 0.86 p =0.390

In the present study, among the consanguineous marriage, 36(57.14%) were neonatal mortality, 16(25.40%) infant mortality and 11(17.46%) were 1-5 years deaths. In the non-consanguineous marriage 37(48.05%) were neonatal mortality, 22(28.57%) infant mortality and 18(23.38%) were 1-5 year deaths. However, the pattern of under- five mortality was not found to be statistically significant in the two groups.

Table 31 : Association between under-five mortality and types of consanguineous marriages

	First-cousin		Uncle-niece		Others		Total Number
	Number	**%**	**Number**	**%**	**Number**	**%**	
Under five mortality	36	8.40	19	9.94	08	9.30	63

$\chi^2 = 0.388$ DF = 2 p = 0.824

The under five-mortality in first-cousin was 36(8.40%), uncle-niece 19(9.94%) and others 8(9.30%). In our study, no significant association was observed between types of consanguineous marriages and under-five mortality.

Table 32: Reasons for under-five children mortality of study participants

Reason	Consanguineous Marriage		Non-Consanguineous Marriage		Total number	%
	Number	%	Number	%		
Acute Diarrheal Disease (ADD)	06	9.53	08	10.39	14	10.00
Acute Respiratory Tract Infection(ARI)	03	4.76	05	6.49	08	5.71
Fever with/without rash	05	7.92	07	9.09	12	8.57
Congenital Anomalies	21	33.34	10	12.98	31	22.14
Birth Asphyxia	04	6.35	05	6.49	09	6.46
ADD & Fever with/without rash	04	6.35	09	11.68	13	9.28
ARI & Fever with/without rash	05	7.92	10	12.99	15	10.71
Any other reasons	15	23.83	23	29.89	38	27.14
Total	**63**	**100.00**	**77**	**100.00**	**140**	**100.00**

In our study, higher number of participants gave congenital anomalies as the reason for under-five mortality in consanguineous marriage 21(33.34%) compared to non-consanguineous marriage 10 (12.98%).

At present, 641 children of different ages were living in consanguineous marriage out of them 130 were under-five years. Similarly, 1443 children of different ages were living in non-consanguineous marriage out of them 344 were under-five years.

Table 33: Congenital morbidities in under-five year children of the study participants

Morbidities	Consanguineous Marriage (n = 130)		Non-Consanguineous Marriage (n = 344)	
	Number	Percentage	Number	Percentage
Mental Retardation &Epilepsy*	4	3.07	0	00
Mental Retardation*	3	2.30	1	0.29
CHD(1 VSA,2 ASD)#	3	2.30	0	00
Deaf mute	2	1.53	0	00
Cleft lip	2	1.53	0	00
Epilepsy*	1	0.80	0	00
Total	**15**	**11.53**	**1**	**0.29**

*Fisher exact test p=0.000 χ^2_{YC}= 14.406 DF=1 p=0.000

#Fisher exact test p=0.020

Fisher exact test p=0.075

In the present study, 130 were under-five children in the consanguineous marriage and 344 in non-consanguineous marriage. Out of 130 children in consanguineous marriage 4 (3.07%) had mental retardation and epilepsy, 3 (2.30%) mental retardation only, another 3 (2.30%) had CHD, 2 (1.53%) deaf mute, 2 (1.53%) had cleft lip and 1(0.80%) child had epilepsy. Out of 344 children in non-consanguineous marriage only 1(0.29%) child had mental retardation. A significant association was observed between mental retardation, epilepsy and / or both CHD and Consanguineous marriage. However, no significant association was observed between deaf mute and cleft lip and consanguineous marriage.

DISCUSSION

Table 1: Age distribution of study participants

In our study, 755 married women were interviewed. Among them 5.03% were ≤ 19 years, 71.39% were in the reproductive age group of 15-49 years and 16.68% were ≥ 60 years.

Table 2: Distribution of study participants according to literacy status

In the present study, 40.52% of the married women were illiterates. About 30.61% had studied up to primary level, 25.03% up to high school level, 3.05% had gone to PU college and only 0.79% were graduates.

In a study on Qatari population showed 56.40% were illiterates in consanguineous marriage and 47.60% in non-consanguineous marriage.[28]

Table 3: Distribution of study participants according to their husbands education

In this study, 29.41% husbands of the participants were illiterates, 35.37% had studied up to primary level of education, 24.76% up to high school level, 7.68 % had been to PU college and 2.78% were graduates.

Table 4: Distribution of study participants according to occupation

In this study, 64.91% of the participants were housewives, 24.91% employed as agricultural labours, 5.82% were employed as factory workers, 0.66% worked as coolies and remaining 3.71% were shop owners, tailors, clerks etc.

A study conducted showed that 76.10% in consanguineous and 74.80% in non-consanguineous marriage were housewives.[28]

Table 5: Distribution of study participants according to socio-economic status

In the present study, majority 60.66% of the study participants belonged to Class IV socio-economic status, 22.25% to Class III, 12.98% to Class V, 2.65% to Class II and only 1.46% belonged to Class I.

A study conducted in Mumbai, 33.30% women in lower economic class were consanguineously married while the proportion was 27.40% for those with upper lower economic class and 25.00% for those with lower middle, upper middle or upper economic class.[7]

Table 6: Distribution of study participants according to type of family

In our study, 53.25% belonged of joint family followed by nuclear family 44.37%, 1.33% lived in three generation family and only 1.05% had broken family.

A study done at Yemen, 61.50% and 38.50% lived in nuclear family in consanguineous and non-consanguineous marriages.[5]

Table 7: Distribution of study participants according to religion

In this study, 90.73% of the participants were Hindus, 9.14% were Muslims and only 0.13% was Christian.

In a study done in Belgaum district, 92.40% of the participants were Hindus and remaining 7.60% were Muslims. [13]

Table 8: Distribution of study participants according to age at marriage

In the present study, 76.42% of the married women were in the age group of 10-19 years and remaining 23.58% in the age group of 20-29 years.

In a study done in Mumbai, 51.50% were married in the age group of 10-14 years in consanguineous marriage and 48.50% in non-consanguineous marriage.

Nearly, 30.20% had married ≥20 years in consanguineous and 69.80% in non-consanguineous marriage.[7]

Table 9: Distribution of study participants according to age at marriage of their husbands

In our study, 75.76% husbands of the participants were married in the age group of 20-29 years, 23.31% in the age group of 10-19 years and 0.93% between 30-39 years.

Table 10: Prevalence of consanguineous marriage

In our study, the prevalence of consanguineous marriage was 27.94%. The findings are comparable with various studies done in Mumbai (28.70%) and Pondicherry (30.80%).[7,17] However, it is less when compared to studies done in Karnataka (36.00%), other parts of TN (51.00%) and North India (37.98%).[13,16, 21] This could be attributed to urbanization, modernization and the gradual shift to smaller family sizes imposing constrains on consanguineous marriage.[36]

Table 11: Types of consanguineous marriages

In this study, 58.77% of the marriages were between first cousin (cross-cousin and parallel-cousin) followed by 28.90% between uncles – niece and 12.33% were other than these types of marriages.

A study was done in Belgaum district and it was observed that 55.44% were between first cousin followed by 33.80% between uncle – niece and 11.60% between other types of consanguineous marriages.[13]

Most studies have reported that first cousin is the most common type of marriage among consanguineous unions.[5,6,7,9]

Table 12: Distribution of married women according to degree of consanguinity

In this study, first degree consanguinity was not found as mating between biological first – degree relatives (i.e. father – daughter, mother – son, brother – sister) is defined as incest. There is no published data on the number of off-springs produced from incestuous unions between first degree relatives.[29] Nearly 28.90% were second degree consanguinity and 71.10% of the marriages were third degree and beyond in our study.

A study conducted in members to know the proportion of consanguineous marriage it was observed that 73.50% were married between third degree relatives (first cousin), 20.60% were married with second cousin or other relatives and 5.90% were married with second degree relatives (uncle – niece, aunt – nephew).[7]

Table 13: Distribution of study participants according to various reasons for consanguineous marriage

In our study, 28.43% had preference of mates within kin group, 17.06% preference of mates within kin group and greater marriage stability, strengthening of ties and strong family tradition (7.58%) , strengthening of ties and greater marriage stability (5.21%) , 4.26% said strong family tradition as the reason , 3.79% felt consanguineous marriage had greater marriage stability.

In a study conducted in Karachi, Pakistan it was observed that 53.60% of respondents gave the reason for consanguineous marriage as the security of knowing the mate in the family before marriage, 31.10% for cultural, religious reason, 2.80% said that they had more information about mate before marriage and 2.10% said that there was more trust available within family.[30]

Table 14: Association between consanguineous marriage and age groups

In the present study, 25.59% of the study participants had consanguineous marriage above the age of 60 years followed by 19.43% between 50 – 59 years. Consanguinity was least 5.69% in women ≤ 19 years and was observed to be highest 45.02% among women above the age of 50 years. Majority of the study participants belonging to consanguineous 54.97% and non-consanguineous marriages 56.02% were in the reproductive age group of 15-49 years.

The frequency of consanguinity 60.60% was higher in women above 40 years compared to women below 40 years seen in only 39.34%. This could be due to the increasing modernization because of which the chances of such marriage could have declined as individual begin to enjoy greater freedom in the process of mate relation.[29,30]

Table 15: Association between educational status of participants and consanguineous marriage

In our study, a significant association was observed between the educational status of study participants and consanguinity. More consanguineously married women 51.66% were reported to be illiterates compared to non–consanguineously married women seen in only 36.21% ; conversely women with high school and higher level of education are less likely to marry between relatives (17.53 % of consanguineous marriages compared to 33.34% of non – consanguineous marriages).

The findings were comparable to a study done on Qatari population where 56.40% were illiterates in consanguineous marriage. Women with university education were less likely to be married to cousins (12.10% of non – consanguineous compared to those in 6.70% in consanguineous).[28]

In another study, 63.00% of subjects who were either illiterates or had completed primary education only were married to a relative compared to 46.00% who had higher education.[31]

Table 16: Association between educational status of husbands of participants and consanguineous marriage

In the present study, higher 36.97% consanguineously married women had husbands who were illiterates compared to 26.47% in non – consanguineous unions. About 37.44% of husbands in consanguineous unions had completed primary level of education compared to 34.55% in non – consanguineous. Husbands who had studied up to high school and higher were less likely to be married within relatives (25.59% in consanguineous and 38.98% in non – consanguineous).

A possible reason for this could be greater knowledge of the adverse effects of consanguineous marriage among husbands who had higher education.

A similar pattern between consanguinity and husband's education was observed in a study conducted on Qatari population, although the difference was not statistically significant.[28]

Table 17: Association between family type of participants and consanguineous marriage

In this study, no significant association was seen between the type of family and consanguinity though higher (54.98%) consanguineously married women lived in joint families compared to non – consanguineous marriage (52.57%). This is similar to a study done in Arab, where consanguineous marriage was found to be higher in extended family.[5]

Table 18: Association between socio-economic status of participants and consanguineous marriage

Our study did not show any difference in the socio-economic status between the consanguineous and non – consanguineous marriage. Majority (60.66%) of the study participants in both groups belonged to Class IV socio-economic status.

The finding is similar to a study done in Mumbai, where the proportion of consanguineous marriage with respect to the economic status of the family was not found to be statistically significant.[7] However, findings are in contrast to other studies done where it was found that the higher the socioeconomic background of respondents, lower the incidence of consanguineous marriage.[5,6]

Table 19: Association between religion of participants and consanguineous marriage

In our study, among the consanguineous marriage, 83.42% were Hindus, 16.58% were Muslims. In the non-consanguineous marriage 93.56% were Hindus, 6.25% were Muslims and only 0.19% participant was Christian. A significant association was observed between Muslim religion and consanguineous marriage.

The findings of this study are in contrast to studies done in other places where consanguinity was found to be higher among Hindus compared to Muslims.[15,17]

The probable reasons for higher consanguinity among Muslims in our study could be due to poverty, illiteracy and religious reasons.

A study done in Belgaum district, it was observed that consanguinity was higher among Muslims 39.40% as compared to Hindus 35.70% .[13]

Consanguineous marriage is common in all Indian Muslim communities. Variations are, however, seen in the levels of consanguineous union contacted in different branches of Islam and between specific communities, and these differences emphasize the important inference of local and regional customs in the arrangement of marriage contacts.[10]

Table 20: Association between religion and types of consanguineous marriages

In this study, first cousin marriage was the most common type of consanguineous marriage among Hindus (75.00%) and Muslims (25.00%). Uncle–niece was seen only among Hindus (100.00%).

A similar observation was made in studies where first cousin was the most common followed by uncle–niece.[16,17,19] First cousin unions are culturally preferred. The reason in case of marriage decision making when the potential spouse is well – known and considered to be part of the "extended family". And these marriages also tend to reinforce social and kin bonds from one to the next generation.[3]

Uncle – niece marriage was seen only among Hindus and this preference seemed to be related to certain socio-cultural norms that ensured family stability.[19] In Muslims, uncle–niece marriages are not permissible being regarded as incest relation.[5]

Table 21: Association between age at marriage of participants and consanguineous marriage

In the present study, although higher 80.56% of the consanguineously married women were seen in the age group of 10 – 19 years compared to 74.82% in non – consanguineous marriage, no statistical significance was observed between age at marriage of women and consanguinity. A probable reason for this could be greater awareness of the consequence of consanguineous marriage.

Many studies have found that the proportion of consanguineous marriage was significantly higher among women who got married at an early age.[5,7,32]

Table 22: Association between age at marriage of husbands of participants and consanguineous marriage

In this study, no significant association was seen between age at marriage of husbands of participants and consanguinity. Although higher 28.90% of marriages had occurred in the age group 10–19 years in consanguineous marriage compared to 21.14% in non - consanguineous marriage, no significant difference was observed.

A study done at Turkey showed that father's age at first marriage was 22.85 ±0.191 years for consanguineous marriage and 24.14±0.131 years for non - consanguineous marriages and this difference was significant.[40]

Table 23: Association between family planning practices of participants and consanguineous marriage

In this study, 62.55% of married women in consanguineous marriage and 62.68 % in non–consanguineous marriage were practicing any type of family planning methods. However, this difference was not found to be statistically significant. A probable reason for this could be better family planning practices among consanguineous married couples after completing the family.

Table: 24 and 25 Association between parity and consanguineous marriage and mean number of pregnancies (fertility pattern) among participants

In this study, consanguineously married women showed higher parity. Nearly 51.18% and 13.75% had 2–5 and ≥6 parity respectively in consanguineous marriage compared to 44.67% and 6.25% in non - consanguineous marriage. This difference was found to be statistically significant. Significantly higher (3.6 ± 2.05) mean

numbers of pregnancies were seen in consanguineous marriage compared to women in non - consanguineous marriage (2.9 ± 1.67). The increased fertility could be due to early age at marriage and a longer reproductive life span.[17]

The findings are similar to studies done in other places like Punjab province of Pakistan and Tunisia were higher fertility outcomes were reported in consanguineous marriage.[32,37]

A study done in South India, did not show any significant effects of inbreeding on fertility. The interpretation of the inbreeding effects on fertility are made difficult because of differences in age and marital factors in the groups under comparison, and in the methodology adopted.[34]

Table 26 and 27: Association between pregnancy outcomes and consanguineous marriage and types of consanguineous marriages

In our study, significant association was observed between pregnancy outcomes and consanguinity. In the consanguineous marriage the frequency of abortions (6.25%) and still-births (2.33%) were higher compared to non-consanguineous marriage (3.57% abortions and 1.06% still births). The number of live births were comparatively higher (95.37%) in non-consanguineous marriage compared to consanguineous marriage (91.42%).

Abortions were found higher in consanguineous marriages in other studies also.[13,17,18,24] Similarly studies have shown higher still-births among consanguineous marriages.[8,22,40] However, there are studies that have showed no association between consanguinity and pregnancy outcomes like abortions and still-births.[15,23,37]

The increased rates of loss of life in consanguineous marriage could be due to the homozygosity of detrimental (lethal) genes brought about by the marriages of close relatives.[16]

On further analysis with the types of consanguinity and pregnancy outcomes, no significant association was observed. A probable reason for this in our study could be small number of uncle-niece marriages.

This finding is similar to a study done in Israel, where the analysis of reproductive wastages showed no significant differences in frequency of abortions and stillbirths between the three groups (first cousin, distant relatives and unrelated) .[23]

Table 28: Causes of abortions in consanguineous and non-consanguineous marriages

In the present study, frequency of congenital anomalies were higher (22.92%) in consanguineous marriage compared to non-consanguineous marriage (8.78%). Fall / accidents were almost the same in consanguineous and non-consanguineous marriages (2.08% and 3.50%); stress like lifting of heavy weight or travel was 4.16% in consanguineous and 10.53% in non - consanguineous marriage. Nearly 70.84% participants in consanguineous marriage and 77.19% in non - consanguineous marriage were not aware of the reasons for abortions.

Table 29 and 30: Association between under-five year mortality and consanguineous marriage and pattern of under-five children mortality

In this study, 8.94% and 5.05% under-five mortality were observed in consanguineous and non - consanguineous marriages. This difference was statistically significant. This shows that post-natal mortality is higher in consanguineous marriage;

however, on further analysis of pattern of under-five mortality in consanguineous and non–consanguineous marriage regarding neonatal mortality, infant mortality and 1-5 years death, no statistically difference was found.

A number of studies have shown that post-natal mortality is higher in the pregnancy of consanguineous unions at least in part to the expression of deleterious recessive genes.[10,15,23,24,35]

Table 31: Association between under-five mortality and types of consanguineous marriages

The under five-mortality in first-cousin was 8.40%, uncle-niece 9.94% and others 9.30%. In our study, no significant association was observed between types of consanguineous marriages and under-five mortality. This could be due to small number of uncle-niece marriages.

Table 32: Reasons for under-five children mortality of study participants

In the present study, 33.34% of the study participants in the consanguineous marriage gave congenital anomalies as the reason for under–five year mortality compared to 12.98% in non-consanguineous marriage. A possible reason for this could be the higher expression of lethal genes in consanguineous marriage. There was no much difference in non–genetic factors like infectious disease (ARI, ADD, Fever with / without rash), birth asphyxia and other reasons as the cause for under -five year mortality in consanguineous and non-consanguineous marriage.

A study conducted in Dubai and Al Ain and it was observed that incidences of malignancies, congenital heart diseases, congenital abnormalities, mental retardations and handicaps were higher in the off-spring of consanguineous couples. The incidence

was found to be 5.80% in consanguineous marriage and 1.20% in non-consanguineous marriage.[18]

Table 33: Congenital morbidities in under-five year children of the study participants

In our study, total percentage of congenital morbidities seen in children in consanguineous marriage was 11.53 and 0.29 in non-consanguineous marriage. In a study done to know the frequency of congenital malformations, it was observed that 7.00% of the children in consanguineous marriage had congenital abnormalities.[22,40]

Another study was conducted in North India; the percentage of congenital disorder in consanguineous marriage was 10.08 compared to non-consanguineous marriage 2.70.[21]

In another study, the prevalence of congenital malformations among the off-spring of related parents in Israel population was 15.1-15.8%.[23]

In the present study, mental retardation and/or epilepsy were higher 6.17 % in consanguineous marriage compared to non-consanguineous marriage 0.29%.

In a study conducted in Iran to know the effects of consanguineous marriage on congenital malformations, 39.80% had mental retardation, 13.90% had epilepsy, and 13.50% had blindness and deafness.[33]

In this study, 2.30% of children had CHD, 1.53% were deaf mute and another 1.53% had cleft lip. In a study, 14.70% infants had CHD in consanguineous marriage and the most common anomalies were VSD, TOF, endocardial cushion defect.[22] Another study showed that the frequency of CHD was 15.40% among the genetic disorders.[38]

A study was done in South India, it was observed that first cousin marriage (44.68%) and uncle-niece marriage (46.81%) were equally significant in increasing CHDs. The subtypes of CHDs associated with consanguinity were found to be ASD and PDA.[39]

In another study done in developing countries it was observed that there was significant association between parental consanguinity and CHD .[41]

CONCLUSION

The present study revealed that more than one fourth (27.94%) of the marriages were between relatives. The consanguinity was associated with adverse pregnancy outcomes like abortions and still births. There was significant association between congenital morbidities and consanguinity. The under-five mortality was observed to be higher among the consanguineously married couples.

SUMMARY

The present study was a cross-sectional study undertaken to know the prevalence of consanguineous marriage, its effect on fertility pattern, pregnancy outcomes and health status of under-five year children in Khaderwadi village which is one of the villages under Primary Health Centre (PHC) Kinaye adopted by J.N.Medical college. The duration of the study was for one year from 1st January 2008 to 31st December 2008.

The study population consisted of 755 married women and 474 under-five children. After taking informed consent, all the married women including widows and their children less than five years who are residing more than one year in the study area were included in the study.

Majority 71.39% of the study participants were in the reproductive age group of 15-49 years and 40.52% of participants were illiterates. Nearly 64.91% participants were housewives, 53.25% of study participants lived in joint family and 60.66% belonged to Class IV socio-economic status. Majority 90.73% of the study participants were Hindus. About 76.42% of the participants were married between 10-19 years and among them 62.54% were practicing any type of family planning methods.

There was no significant association between consanguinity and socio-economic status, age at marriage and type of family. No association was observed between consanguinity and family planning methods. Consanguinity was higher among illiterate women 109 (51.66%) compared to women in non-consanguineous marriage 197 (36.21%).

The prevalence of consanguineous marriage was 27.94%. The most common type of marriage was between first cousin 58.77% (44.08% cross-cousin and 14.69% parallel-cousin) followed by uncle-niece 28.90% and remaining 12.33% were other than these types of marriages. The most common reason for consanguineous marriage was preference of mates within kin group (28.43%).

Significantly higher (3.6 $\pm$ 2.05) mean number of pregnancies were seen in consanguineous when compared to women in non-consanguineous marriage (2.9 $\pm$ 1.67).

A significant association was observed between consanguinity and pregnancy outcomes. The total number of pregnancies in consanguineous marriage was 770 out of which 48 (6.25%) had abortions, 18 (2.33%) still births and 704 (91.42%) live births.

Congenital anomalies as the reason for abortion were higher 11 (22.92%) in consanguineous marriage as compared to non-consanguineous marriage 5 (8.78%).

Significantly higher 63 (8.94%) number of under-five mortality was seen in children in consanguineous marriage compared to 77 (5.05%) in non-consanguineous. However, on further analysis, no statistical significance was observed regarding neonatal, infant and 1-5 year deaths and consanguineous marriage.

Higher number of participants gave congenital anomalies as the reason for under-five mortality in consanguineous marriage 21(33.34%) compared to non-consanguineous marriage 10 (12.98%).

In consanguineous marriage 4 (3.07%) had mental retardation and epilepsy, 3 (2.30%) mental retardation only, another 3 (2.30%) had CHD, 2 (1.53%) were deaf

mute, 2 (1.53%) had cleft lip and 1(0.80%) child had epilepsy. In non-consanguineous marriage only 1(0.29%) child had mental retardation.

A significant association was observed between mental retardation, epilepsy and / or both and CHD and consanguinity. However, no such association was observed between deaf mute and cleft lip and consanguineous marriage.

LIMITATIONS

- None of the study participants knew the reason for abortions and still births.
- The exact cause of death could not be asserted as consanguinity was one of the reasons for increasing the mortality in children.
- It was not possible to do any investigations due to high cost.

RECOMMENDATIONS

- The findings of this study brings an attention to the policy makers in Government, social and religious institutions regarding the adverse effects of consanguineous marriage, which has been a long standing cultural practice in India .Great care must be taken that the society understands the issue and voluntarily agrees to avoid any marriage between biological relatives. To ensure this, IEC (Information, Education and Communication) programme is needed on these matters.
- The health worker should make it a routine practice to ask the couples the history of consanguineous marriages. If the health worker comes across any such marriage in a family, he/she should educate the family about this issue in order to help them choose the right option for a subsequent marriage in the family.
- Consanguineously married couples should be questioned regarding any birth defects in the ancestors and their progeny and should be advised about genetic counseling.
- Appropriate and convenient time to instill the importance of preventing consanguineous seems to be the adolescent age. Therefore, it is necessary in every school and college to create awareness amongst adolescents and their parents regarding consanguineous marriage and probable effects..
- In conjunction with community education programmes, new diagnostic, counseling, and treatment skills are needed.

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ANNEXURE-I: INFORMED CONSENT FORM

"EFFECTS OF CONSANGUINEOUS MARRIAGE ON FERTILITY, PREGNANCY OUTCOMES AND ON HEALTH STATUS OF UNDER FIVE – YEAR CHILDREN - A RURAL CROSS - SECTIONAL STUDY".

INVESTIGATORS: DR. S.M. KATTI, DR. VEENA K.

Introduction

You are being invited to participate in this study to find out the Effects Of Consanguineous Marriage On Fertility, Pregnancy Outcomes And On Health Status of under five – year children - In Rural Area of Khaderwadi village, under Kinaye PHC.

Explanation of procedures

In this study you will have to answer a few questions prepared on number of children, pregnancy outcome like abortions, still birth, neonatal death, infant death, child death and any illness among the children's. The entire procedure may take about 30 minutes.

If you agree to participate, you will be continued asking questions but the moment you don't want to continue then you can leave.

Possible Benefits

The investigator does not promise or guarantee that you will receive direct benefit being in the study. It will benefit for the whole community because by this study we will come to know the effects of consanguineous marriage. This study will surely help in future for the development of the community.

Confidentiality

Your identity will not be revealed. All information will be collected and coded so that no one will know your identity.

Withdrawal

Participation in this study is voluntary. If you don't not wish to participate in this study, you will not lose benefits to which you are entitled.

Costs of Participation

The cost of the study will be borne by the researcher. There will be no additional cost to you for participating in this study.

Payment of Participation

There will be no incentives to you for participating in this study.

Risks involved in the Study to the Participants

This survey does not contain any interventions or major procedures hence has no adverse effects on the participants. However, if you have any questions about this study, you should contact Dr.S.M. KATTI and Dr. VEENA K. at 9036056306.

if you have any questions about your rights as a study participant, you may contact Dr V.D. PATIL, Chairman, JNMC Institutional ethics committee on human subjects research at 0831 2741701.

Legal Rights

By signing this consent form, you are not waiving any of your legal rights.

Publication rights

The results of the survey will be used for teaching and medical publications however the participants' identity will be kept confidential .

Consent statement

I volunteer and consent to participate to participate in this study. I have read the consent or it has been read to me. The study has been fully explained to me and I may ask questions at any time.

_____

Signature or Left Hand Thumb Impression

(Volunteer Subject) Date

_____

Signature of Person Obtaining Consent Date

_____

Signature of Witness Date

ANNEXURE-II: PROFORMA

Serial No : **Date of Survey:**

I) Socio-demographic Data

Name : **Present age of woman:**

Age at Marriage: Wife_____yrs **Husband_____yrs**

Education of Wife : Illiterate/ Primary/High school/PUC College / Diploma/Graduation / Post Graduation

Education of Husband: Illiterate/ Primary/ High school/ PUC College / Diploma/Graduation / Post Graduation

Occupation of Wife:

Religion : Hindu/ Muslim/ Christian/ Others_____

Family History: Total No. of Family members : Adults: Male Female

Children 0-5 yrs:

Type of Family :Nuclear/Joint /3 generation

Broken/Problem

Total income of Family : In Rs._____ per month

Per capita income : In Rs. _____ per month

II) History of consanguineous Marriage : **Yes** **No**

If Yes Ist degree : Type: Uncle Niece

IInd degree : Cross Cousin

IIIrd degree : Parallel cousin

Others (specify)_____

Reasons for consanguineous marriage:

- Strengthening of ties.
- Maintenance of family property and land.
- Parental domination.
- Preference for mates within kin groups.
- Strong family tradition of consanguineous unions.
- Financial advantages relating to dowry or bridewealth payments.
- Greater marriage stability & durability.
- Low level of educational attainment.
- Others specify_____

III) Family planning:

Family Planning Practice of any type: Yes No

IV) Obstetric History:

Para (P): Abortion: Living: Dead:

PREGNANCY WASTAGE	**P_1**	**P_2**	**P_3**	**P_4**
Abortion (Yes/No)				
Reasons if Any (Specify)				
Still Birth: (Yes/No)				
If Yes: Reasons (specify)				
Neonatal death: (Yes/No)				
If Yes: Reasons if any				

V) Under five mortality

a) Infant death: (Yes/No)				
If Yes: Reasons (specify)				
b) 1-5yr child death: (Yes/No)				
If Yes: Reasons (specify)				

VI) Under 5 Child Health Status (Notably congenital anomalies)

General Physical Examination of Children				
Systemic Examination of children				
CVS				
RS				
PA				
CNS				
Musculo Skeletal				
Genito urinary				
Any other significant observations				

KEY TO MASTER CHART

1. Serial number - SN
2. Present Age of Woman in years - PAW
3. Age at Marriage of Wife in years - AMW
4. Age at Marriage of Husband in years - AMH
5. Education of Wife-EDN WIFE
   - 1 - Illiterate
   - 2 - Primary
   - 3 – High school
   - 4 - PUC College / Diploma
   - 5 - Graduation
6. Education of Husband –EDN HUSBAND
   - 1- Illiterate
   - 2 - Primary
   - 3 – High school
   - 4 - PUC College / Diploma
   - 5 - Graduation
7. Occupation of Wife-OCC WIFE
   - 1 – House wife
   - 2- Agricultural labour
   - 3 – Factory worker
   - 4 – Daily wages
   - 5 – Any other Profession
8. Religion
   - 1 – Hindu
   - 2 – Muslim
   - 3 – Christian

9. Under five year children Males – UF MALE

10. Under five year children Females – UF FEMALE

11. Type of Family
    1 – Nuclear family
    2 – Joint family
    3 – Three generation family
    4 – Broken family

12. Socio-economic status I , II ,III , IV , V - SES

13. Consanguineous marriage – CON MARRIAGE
    1 – Yes
    2 – No

14. Type of Consanguineous marriage – TYPE OF CONM
    1 – Uncle-Niece
    2 – Cross-cousin
    3 – Parallel -cousin
    4 – Others

15. Reasons for Consanguineous Marriage – REASONS CONM

    1 – Strengthing of ties

    2 – Preferences of mates within kin group

    3 – Strong family tradition of consanguineous

    4 – Greater marriage stability and durability

    5 – Strengthing of ties and Preferences of mates within kin group

    6 – Strengthing of ties and Strong family tradition of consanguineous

    7 - Strengthing of ties and Greater marriage stability and durability

    8 – Preferences of mates within kin group and Strong family tradition of consanguineous

    9 – Preferences of mates within kin group and Greater marriage stability and durability

10 - Strong family tradition of consanguineous and Greater marriage stability and durability

11 - Strengthing of ties, Preferences of mates within kin group and Strong family tradition of consanguineous

12 - Strengthing of ties, Strong family tradition of consanguineous, Greater marriage stability and durability

13 - Strengthing of ties , Preferences of mates within kin group and greater marriage stability and durability

14 - Preferences of mates within kin group Strong family tradition of consanguineous And Greater marriage stability and durability

15- Strengthing of ties , Preferences of mates within kin group Strong family tradition of consanguineous and Greater marriage stability and durability

16 . Family Planning – FP 1 - Yes

2 - No

17 . Total number of pregnancies – TOTAL PREG

18 . Number of Parity - PARITY

19. Number of Live births - LB

20. Number of Still births - SB

21. Number of Abortions - ABORTION

22 . Reasons for Abortion –REASON ABOR

1 – Fall / Accident

2.- Congenital Anomalies

3 – Stress (travelling) / lifting of heavy weight

4 – Unknown reasons

5 – Any other reason

23 . Number of Under-Five Mortality - UFM

24 . Reasons for Under five Mortality – REASON UFM

1 – Acute Diarrheal Disease

2 - Acute Respiratory tract Infection

3 – Fever with or with out rash

4 – Congenital anomalies

5 – Birth asphyxia

6 - Acute Diarrheal Disease and fever with or without rash

7 - Acute Respiratory tract Infection and fever with or without rash

25 . Number of Neonatal Death – N DEATH

26. Number of Infant Death – I DEATH

27 . Number of 1-5 years death – 1-5 YR DEATH

28. General Physical Examination- GPE - 0 – No Abnormality Detected

1- Cleft lip

2 – Deaf mute

3 – Any other problem

29. Cardiovascular System - CVS 0- No Abnormality Detected

1- Congenital Heart Disease

30. Respiratory System – RS	0- No Abnormality Detected
31. Per Abdomen – PA	0- No Abnormality Detected
32.Central Nervous System- CNS	0- No Abnormality Detected
	1- Mental Retardation
	2- Epilepsy
	3-Mental retardation and Epilepsy
33. Musculoskeletal system-MSS	0 -No Abnormality Detected
34. Genito-urinary system - GUS	0 - No Abnormality Detected

ANNEXURE – III: MASTER CHART

SN	PAW	AMW	AMH	EDN WIFE	EDN HUSBAND	OCC WIFE	RELIGION	UFC MALE	UFC FEMALE	TYPE FAMILY	SES	CON MARRIAGE	TYPE OF CON M	REASONS CONM	FP	TOTAL PREG	PARITY	LB	STILL BIRTH	ABORTION	REASON ABOR	UFM	REASON UFM	N DEATH	I DEATH	1-5 YR DEATH	GPE	CVS	RS	PA	CNS	MSS	GUS
1	22	19	21	2	2	1	1	1	0	1	4	1	2	6	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	28	20	22	3	2	1	2	2	0	2	5	1	3	6	2	4	2	2	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0
3	25	18	28	3	4	2	1	1	1	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	55	18	20	1	3	2	1	0	0	2	5	2			1	4	4	4	0	0	0	0	0	0	0	0							
5	25	15	17	1	3	1	1	1	1	2	5	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	58	12	15	1	2	1	1	0	0	2	5	2			1	4	3	4	0	1	4	1	2	0	1	0							
7	40	11	15	1	2	1	1	0	1	1	5	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	45	20	20	1	2	1	1	0	0	1	4	1	2	6	1	5	5	5	0	0	0	0	0	0	0	0							
9	55	19	20	1	2	2	1	0	0	1	5	1	2	3	2	5	5	5	0	0	0	1	2	0	0	1							
10	70	17	20	1	1	2	1	0	0	1	4	1	2	11	1	5	5	5	0	0	0	2	1	0	2	0							
11	60	18	20	2	2	2	1	0	0	1	5	1	2	7	1	5	5	5	0	0	0	0	0	0	0	0							
12	28	18	23	2	3	1	1	1	1	1	4	1	1	5	1	3	2	2	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
13	42	21	30	2	2	1	1	0	0	1	5	2			2	3	3	3	0	0	0	0	0	0	0	0							
14	29	22	24	5	5	5	1	1	1	2	3	2			2	2	1	2	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
15	18	18	27	1	2	1	1	0	0	2	4	2			2	0	0	0	0	0	0	0	0	0	0	0							
16	35	18	20	2	2	5	1	0	1	1	5	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	40	19	25	2	3	2	1	0	0	1	5	2			1	2	2	2	0	0	0	0	0	0	0	0							

18	28	17	19	1	1	1	2	2	1	1	4	2			1	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	32	17	18	2	2	2	1	2	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	30	20	25	2	1	1	1	1	1	2	4	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	48	16	23	2	3	1	1	0	0	1	5	2			2	1	0	1	0	1	4	0	0	0	0	0							
22	45	15	25	1	2	2	1	0	0	1	4	2			1	5	5	5	0	0	0	1	5	1	0	0							
23	21	18	28	4	3	1	1	0	1	1	2	2			2	3	1	2	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
24	21	19	26	3	3	1	1	0	1	1	1	2			2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	35	17	26	1	1	1	1	0	0	1	4	1	2	2	1	2	2	2	0	0	0	0	0	0	0	0							
26	35	16	24	2	2	2	1	1	1	1	3	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	52	17	20	1	3	2	1	0	0	3	3	1	2	9	1	5	5	5	0	0	0	0	0	0	0	0							
28	24	16	21	2	2	1	2	2	0	1	4	1	3	3	2	2	2	1	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
29	23	18	25	3	4	1	1	1	0	1	3	1	2	12	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	50	15	18	2	2	1	1	0	0	1	5	1	2	9	1	2	2	2	0	0	0	0	0	0	0	0							
31	40	18	24	2	2	2	1	0	0	1	4	1	2	6	1	3	3	3	0	0	0	0	0	0	0	0							
32	55	20	22	1	1	1	1	2	1	2	5	1	2	9	1	4	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	40	16	20	3	3	5	1	0	0	1	4	2			2	3	3	3	0	0	0	0	0	0	0	0							
34	40	17	23	2	4	2	1	0	0	2	5	2			1	3	3	3	0	0	0	0	0	0	0	0							
35	55	17	19	2	2	2	1	0	0	1	4	2			1	4	4	4	0	0	0	0	0	0	0	0							
36	21	16	20	3	2	1	1	1	1	2	5	2			2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	32	17	19	1	1	1	1	1	1	1	4	1	1	14	1	4	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	70	15	18	1	1	2	1	0	0	1	4	2			2	3	3	3	0	0	0	0	0	0	0	0							
39	28	20	24	3	3	1	1	1	1	2	4	2			2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	28	19	28	3	3	1	1	1	1	2	4	2			2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	26	18	19	3	2	1	1	1	1	1	4	1	2	14	2	3	3	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
42	21	17	20	2	3	2	1	1	1	2	4	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	62	15	19	1	1	1	1	0	0	2	3	1	1	2	1	2	2	2	0	0	0	0	0	0	0	0							

44	60	17	21	1	1	1	1	0	0	1	4	2			2	1	1	1	0	0	0	0	0	0	0	0							
45	60	14	18	1	2	1	1	0	1	4	3	2			2	5	5	5	0	0	0	0	0	0	0	0							
46	35	20	25	1	2	2	1	2	0	2	4	2			1	2	4	3	1	0	0	1	3	1	0	0	0	0	0	0	0	0	0
47	35	17	19	1	2	2	1	0	0	1	5	2			1	4	4	4	0	0	0	0	0	0	0	0							
48	46	18	24	2	4	1	1	0	0	1	4	2			2	2	1	1	0	1	3	0	0	0	0	0							
49	45	17	22	2	3	2	1	0	0	1	5	2			1	3	3	3	0	0	0	0	0	0	0	0							
50	24	19	22	2	2	1	1	1	1	2	5	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	70	16	20	1	1	1	1	0	0	2	5	2			1	2	2	2	0	0	0	0	0	0	0	0							
52	40	16	20	2	3	2	1	1	1	2	3	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	55	16	19	1	2	5	1	1	1	2	5	2			1	4	4	4	0	0	0	1	4	0	1	0	0	0	0	0	0	0	0
54	35	17	21	2	2	2	1	0	0	1	4	2			1	4	4	4	0	0	0	1	2	0	0	1							
55	55	16	22	2	2	2	1	2	0	2	4	2			2	4	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	19	19	25	3	3	1	1	1	0	2	4	2			2	3	2	2	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
57	30	17	27	3	3	2	1	1	1	1	3	2			2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	65	15	24	2	2	1	1	0	0	2	4	2			2	3	3	3	0	0	0	0	0	0	0	0							
59	45	18	25	3	2	1	1	0	0	2	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
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61	42	18	26	3	4	1	1	0	0	2	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
62	65	16	21	1	1	2	1	0	0	1	4	2			2	9	4	7	0	2	4	1	1	0	0	1							
63	25	24	28	3	3	5	1	1	1	1	3	2			2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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65	35	19	25	1	1	2	1	0	1	2	3	1	2	11	1	4	4	2	0	1	1	1	4	1	0	0	0	0	0	0	0	0	0
66	42	17	21	1	1	1	1	0	0	2	3	2			1	2	2	2	0	0	0	0	0	0	0	0							
67	65	15	25	1	1	2	1	0	0	2	3	1	2	11	2	5	5	5	0	0	0	0	0	0	0	0							
68	19	17	21	2	2	2	1	0	1	2	3	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	28	20	25	2	2	1	1	2	0	1	4	1	2	2	1	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

70	34	21	28	3	3	2	1	0	1	2	4	2			2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	35	20	26	2	2	1	1	0	0	2	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
72	64	16	22	1	1	2	1	0	0	2	4	1	1	10	2	4	4	4	0	0	0	0	0	0	0	0							
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75	30	18	22	1	1	2	1	0	0	2	4	1	1	9	1	2	2	2	0	0	0	0	0	0	0	0							
76	60	16	20	1	1	2	1	0	0	2	4	1	2	11	1	6	6	6	0	0	0	0	0	0	0	0							
77	19	18	22	1	1	2	1	2	0	2	4	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	28	18	23	1	2	1	1	0	2	2	3	1	1	11	1	3	2	2	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
79	32	20	25	2	2	1	1	0	2	1	4	1	1	12	1	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	35	18	21	1	2	1	2	0	1	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
81	19	17	21	3	3	1	1	0	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
82	55	18	28	2	2	2	1	0	0	1	4	2			1	3	2	3	0	0	0	1	5	1	0	0	0	0	0	0	0	0	0
83	20	19	22	3	2	1	1	0	0	1	4	2			2	1	0	1	0	0	0	0	0	0	0	0							
84	50	18	20	2	3	1	1	0	0	1	4	1	1	6	1	4	4	4	0	0	0	0	0	0	0	0							
85	19	17	21	3	2	1	1	2	0	1	4	2			1	5	4	4	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
86	23	18	22	2	3	1	1	0	0	1	4	1	2	2	2	1	0	0	0	1	4	0	0	0	0	0							
87	55	15	20	1	1	1	1	0	0	1	5	2			1	5	5	5	0	0	0	1	3	0	0	1							
88	40	18	26	3	5	1	1	0	0	1	4	1	2	10	1	3	3	2	1	0	0	0	0	0	0	0							
89	25	21	24	4	3	1	1	2	0	1	4	1	1	6	1	3	2	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
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91	40	22	25	2	2	5	1	0	0	2	3	1	2	9	1	2	2	2	0	0	0	0	0	0	0	0							
92	45	19	25	1	1	1	2	0	0	1	4	1	2	9	1	5	5	4	0	1	3	0	0	0	0	0							
93	55	13	18	1	1	1	1	0	0	2	5	1	2	2	1	3	3	3	0	0	0	0	0	0	0	0							
94	44	17	20	2	3	1	1	1	1	1	4	1	2	2	2	4	3	3	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0
95	18	19	25	3	5	1	2	0	0	1	3	1	2	6	2	0	0	0	0	0	0	0	0	0	0	0							

96	29	21	25	3	2	1	2	1	1	1	4	1	3	2	2	3	3	3	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0
97	19	19	28	3	3	1	2	1	1	1	4	1	3	3	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	52	15	19	1	1	5	2	0	1	2	4	1	3	3	1	4	4	4	0	0	0	1	1	1	0	0							
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102	22	20	23	4	2	1	2	2	0	1	2	1	3	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	60	17	24	2	2	1	1	0	0	2	4	1	2	12	1	6	6	6	0	0	0	0	0	0	0	0							
104	61	15	22	2	2	1	1	0	0	1	3	1	4	2	1	2	2	2	0	0	0	0	0	0	0	0							
105	45	18	25	1	2	1	1	0	0	2	5	1	4	2	1	3	3	2	0	0	0	0	0	0	0	0							
106	25	20	25	2	2	1	1	0	2	1	4	1	1	11	2	4	2	2	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0
107	19	18	24	3	2	1	1	0	0	1	4	2			1	3	3	3	1	0	0	0	0	0	0	0	0							
108	24	20	21	2	2	1	1	0	1	1	4	2			2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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111	24	17	19	3	3	1	1	2	0	2	5	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	56	16	18	1	2	1	1	0	0	2	5	2			2	5	5	5	0	0	0	0	0	0	0	0	0							
113	62	16	20	1	1	1	1	0	0	1	4	2			2	2	2	2	0	0	0	0	0	0	0	0	0							
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115	35	19	23	3	2	1	1	0	0	1	4	2			1	3	2	3	0	1	3	0	0	0	0	0	0							
116	45	16	18	1	3	1	1	0	0	2	4	2			1	3	3	3	0	0	0	0	0	0	0	0	0							
117	65	15	18	1	1	1	1	0	0	2	5	2			2	7	7	7	0	0	0	3	7	1	2	0							
118	35	16	22	2	2	1	1	0	0	2	5	2			1	4	4	4	0	0	0	0	0	0	0	0							
119	19	18	26	1	2	1	1	0	2	4	5	2			2	5	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	75	14	19	1	1	1	1	0	0	2	5	2			2	7	7	7	0	0	0	0	0	0	0	0							
121	40	15	19	1	4	1	1	0	1	2	5	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

122	25	21	23	3	4	1	1	0	1	2	5	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	40	18	22	1	4	1	1	0	0	1	5	2			1	4	3	4	0	1	4	0	0	0	0	0							
124	28	26	30	4	3	1	1	1	1	2	2	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	34	21	24	3	1	5	1	0	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126	60	13	15	1	1	1	1	0	0	2	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
127	25	19	22	3	2	1	1	1	1	2	4	2			2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
128	30	18	20	3	4	1	1	0	0	1	4	2			1	3	3	3	0	0	0	1	1	0	0	1							
129	40	19	22	2	1	2	1	0	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
130	29	21	25	2	2	2	1	0	2	2	4	1	4	10	2	5	3	3	0	2	4	1	2	1	0	0	0	0	0	0	3	0	0
131	58	12	15	1	1	1	1	0	0	2	4	2			1	4	4	4	0	0	0	0	0	0	0	0							
132	40	19	23	1	2	1	1	0	0	1	4	2			1	3	3	3	1	0	0	0	0	0	0	0							
133	23	19	22	3	3	2	1	1	1	1	3	2			2	3	2	3	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
134	42	18	24	2	2	1	1	0	0	1	1	1	4	2	1	3	3	3	0	0	0	0	0	0	0	0							
135	28	18	22	1	2	1	2	0	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
136	40	19	22	3	2	1	1	0	1	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	45	18	20	3	2	2	1	0	0	2	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
138	21	20	25	3	4	1	1	0	0	2	4	2			2	1	0	1	0	0	0	0	0	0	0	0							
139	52	18	21	1	1	3	1	0	0	1	4	2			2	1	1	1	0	0	0	0	0	0	0	0							
140	44	20	23	2	3	1	1	0	0	1	2	2			1	2	2	2	0	0	0	0	0	0	0	0							
141	55	17	19	2	2	1	2	0	1	2	5	2			1	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142	19	19	24	3	4	1	1	2	0	1	2	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	26	20	22	3	3	1	1	2	0	2	4	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	60	14	18	1	1	2	1	0	0	2	4	2			1	4	4	4	0	0	0	0	0	0	0	0							
145	38	17	19	3	2	1	1	0	0	2	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
146	36	17	21	1	1	1	2	0	0	1	3	2			2	2	2	2	0	0	0	0	0	0	0	0							
147	19	20	28	2	4	1	1	2	0	2	4	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

148	55	18	22	2	3	1	1	0	0	2	4	2			1	4	4	4	0	0	0	0	0	0	0	0							
149	40	17	19	3	3	1	1	0	0	2	5	2			1	3	3	3	0	0	0	0	0	0	0	0							
150	55	13	18	1	1	1	1	0	0	2	4	2			2	3	3	3	0	0	0	0	0	0	0	0							
151	50	16	20	2	2	1	1	0	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
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153	35	19	22	2	5	1	1	0	0	1	1	2			1	3	3	3	0	0	0	0	0	0	0	0							
154	20	18	24	4	4	1	1	0	1	1	3	2			2	1	1	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
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156	48	18	23	1	2	1	1	0	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
157	21	21	26	3	4	1	1	0	0	2	4	2			2	1	0	1	0	0	0	0	0	0	0	0							
158	68	15	20	1	2	1	1	0	0	1	3	2			2	2	2	2	0	0	0	0	0	0	0	0							
159	60	13	19	1	1	1	1	0	0	2	4	2			1	4	4	4	0	0	0	0	0	0	0	0							
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161	32	18	23	3	3	1	1	0	1	2	4	2			2	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	55	18	22	2	2	2	1	0	0	1	5	2			1	3	3	3	0	0	0	0	0	0	0	0							
163	19	19	20	3	2	1	1	1	1	1	4	1	2	7	1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164	40	18	21	1	1	2	1	0	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
165	24	22	28	4	4	1	1	0	1	2	4	2			2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
166	26	18	22	3	3	1	1	2	1	2	4	2			1	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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169	24	20	25	3	4	1	1	1	1	1	2	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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172	35	18	22	2	1	3	1	0	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
173	45	18	26	1	1	2	1	0	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0							

174	40	16	25	1	1	1	1	0	0	1	5	1	1	6	1	3	3	2	1	0	0	0	0	0	0	0							
175	41	20	26	2	3	2	1	0	0	1	3	1	2	10	1	4	4	4	0	0	0	0	0	0	0	0							
176	25	17	22	3	3	2	1	2	0	1	5	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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178	40	19	23	3	4	3	1	0	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
179	50	15	9	1	1	2	1	0	0	1	3	2			2	5	5	5	0	0	0	1	2	1	0	0							
180	23	21	25	3	3	1	1	0	0	1	3	2			2	1	0	1	0	0	0	0	0	0	0	0							
181	19	15	9	1	2	1	1	0	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
182	24	19	20	2	3	1	1	1	0	1	3	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183	19	19	25	2	2	2	1	2	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
184	60	15	25	1	1	1	1	0	0	2	4	1	3	6	2	4	4	4	0	0	0	0	0	0	0	0							
185	38	19	26	2	3	1	1	0	1	2	4	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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187	44	18	20	3	4	3	1	0	0	1	3	2			1	2	2	2	0	0	0	0	0	0	0	0							
188	37	17	19	2	4	1	1	0	0	1	4	2			1	5	4	3	0	1	2	0	0	0	0	0							
189	50	17	19	2	3	1	1	0	0	1	5	2			2	2	0	2	0	2	2	0	0	0	0	0							
190	32	16	21	3	3	1	1	2	0	1	4	2			2	3	2	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0
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200	65	17	24	1	2	1	1	0	0	2	4	2			2	9	9	9	0	0	0	0	0	0	0	0							
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204	58	17	19	2	2	1	1	0	0	2	3	1	2	2	2	5	5	5	1	0	0	0	0	0	0	0							
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207	19	18	22	1	2	2	1	0	0	1	5	2			2	4	4	4	0	0	0	0	0	0	0	0							
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209	68	16	22	1	1	1	1	0	0	2	4	2			2	1	1	1	0	0	0	0	0	0	0	0							
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226	42	18	22	2	2	1	1	0	0	2	3	1	2	8	1	3	3	3	0	0	0	0	0	0	0	0							

227	35	19	22	2	2	1	1	0	1	2	4	1	2	13	1	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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229	40	20	23	3	2	1	1	0	0	2	4	2				0	0	0	0	0	0	0	0	0	0	0							
230	28	19	25	2	3	1	1	2	0	1	3	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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232	42	18	21	2	2	1	1	0	0	2	4	1	4	2	2	3	2	2	0	1	4	1	4	0	1	0							
233	45	22	25	2	3	2	1	0	0	2	4	2			2	3	3	3	0	0	0	0	0	0	0	0							
234	34	21	23	2	2	1	1	0	0	2	4	1	2	13	1	3	3	3	0	1	2	0	0	0	0	0							
235	35	20	23	2	2	1	1	0	0	2	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
236	21	14	18	2	2	1	1	0	2	1	5	2			2	3	2	2	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
237	66	15	18	1	1	1	1	0	0	2	4	2			2	5	5	5	0	0	0	0	0	0	0	0							
238	30	17	22	2	2	2	1	0	0	2	4	1	1	12	1	3	2	2	0	1	2	0	0	0	0	0							
239	22	18	19	3	2	1	2	0	1	2	4	2			2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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241	35	18	20	1	1	1	2	0	0	1	4	1	3	11	1	4	4	4	0	0	0	1	3	0	1	0							
242	42	19	21	1	1	1	2	0	0	2	5	2			1	7	7	7	0	0	0	3	8	0	3	0							
243	35	19	22	3	3	1	1	0	0	2	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
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245	25	17	25	2	3	1	1	0	0	2	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
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248	35	17	19	3	3	1	1	0	0	2	4	1	2	2	1	4	4	4	0	0	0	0	0	0	0	0							
249	50	19	23	3	5	3	1	0	0	1	3	1	1	14	2	1	1	1	0	0	0	0	0	0	0	0							
250	45	16	18	2	3	1	1	0	0	1	4	2			1	3	3	4	0	0	0	1	4	0	1	0							
251	32	17	22	1	2	1	1	0	0	1	4	2			1	5	5	5	0	0	0	0	0	0	0	0							
252	44	16	21	1	2	1	2	0	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0							

253	45	18	21	2	2	1	2	0	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
254	65	13	19	1	1	1	1	0	0	2	2	1	4	2	1	3	3	3	0	0	0	0	0	0	0	0							
255	45	16	20	1	3	2	1	0	0	2	2	2			1	3	3	3	0	0	0	0	0	0	0	0							
256	25	20	25	4	5	1	2	0	0	1	1	2			2	2	2	2	0	0	0	0	0	0	0	0							
257	40	19	22	1	2	1	2	0	0	1	1	2			1	2	2	2	0	0	0	0	0	0	0	0							
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259	65	15	19	1	1	1	2	0	0	2	1	2			2	10	10	10	0	0	0	4	8	4	0	0							
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263	28	14	16	2	1	1	2	1	1	1	4	1	4	2	2	6	5	5	0	1	4	3	8	3	0	0	0	0	0	0	0	0	0
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265	26	16	22	1	2	1	2	0	0	2	2	1	3	2	1	3	3	3	0	0	0	1	4	0	1	0							0
266	19	20	24	3	5	1	2	0	0	2	2	1	3	9	2	1	0	0	0	0	0	0	0	0	0	0							
267	48	15	21	2	1	1	1	0	0	1	3	2			1	3	3	2	1	0	0	0	0	0	0	0							
268	25	17	19	1	2	1	2	2	0	2	4	1	3	10	1	4	4	4	0	0	0	1	3	0	1	0	0	0	0	0	1	0	0
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271	45	13	21	1	1	1	1	0	0	2	4	2			1	7	6	7	0	1	4	0	0	0	0	0							
272	60	13	18	1	1	1	2	0	0	2	4	2			1	8	8	6	0	0	0	2	5	0	2	0							
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276	60	15	19	1	1	1	2	0	0	1	4	1	3	9	1	4	4	4	0	0	0	0	0	0	0	0							
277	35	18	21	2	2	1	1	0	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
278	48	17	20	2	3	1	1	0	0	1	3	2			1	2	2	2	0	0	0	0	0	0	0	0							

279	30	19	23	3	3	1	1	0	0	2	4	2			1	3	3	3	0	0	0	1	1	0	0	1							
280	58	17	19	1	1	1	1	0	0	2	4	1	1	9	2	4	4	4	0	0	0	0	0	0	0	0							
281	27	19	22	2	3	1	1	1	1	1	4	1	2	12	1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
282	48	18	22	2	2	2	1	0	0	1	4	1	1	6	1	7	7	6	1	0	0	1	5	1	0	0							
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287	40	18	21	1	3	2	1	0	0	2	3	2			1	3	3	3	0	0	0	0	0	0	0	0							
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290	25	21	25	5	5	1	1	0	1	1	3	2			1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
291	29	21	26	3	3	1	1	0	2	1	4	1	2	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
292	45	17	23	1	1	2	1	0	0	1	4	1	4	5	1	3	3	3	0	0	0	0	0	0	0	0							
293	62	14	19	1	1	5	1	0	0	1	4	2			2	0	0	0	0	0	0	0	0	0	0	0							
294	48	19	22	1	1	3	1	0	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
295	42	16	19	1	1	1	1	0	0	1	3	2			1	5	5	5	0	0	0	0	0	0	0	0							
296	55	17	19	1	1	1	1	0	0	1	3	2			1	5	5	5	0	0	0	1	2	0	1	0							
297	31	21	25	3	3	1	1	2	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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303	58	16	19	1	2	1	1	0	0	1	4	1	1	11	1	3	3	3	1	0	4	0	0	0	0	0							
304	38	19	23	1	2	1	1	0	1	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

305	46	17	26	1	3	2	1	0	0	1	4	2			1	4	4	4	0	0	0	0	0	0	0	0							
306	51	18	21	2	3	2	1	0	0	1	4	2			1	6	6	6	0	0	0	0	0	0	0	0							
307	50	15	18	1	3	2	1	0	0	2	4	2			2	4	4	4	0	0	0	0	0	0	0	0							
308	22	16	22	1	2	1	1	0	2	2	4	2			2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309	19	19	23	3	3	5	1	1	0	1	4	2			2	3	2	2	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
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312	60	18	21	1	1	2	1	0	0	2	4	2			2	4	4	4	0	0	0	0	0	0	0	0				0			
313	25	21	25	3	3	2	1	2	0	2	4	2			2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
314	19	19	23	3	3	1	1	0	0	2	4	1	2	1	2	2	0	0	0	1	4	0	0	0	0	0							
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317	19	19	24	3	2	2	1	0	0	2	4	2			2	1	0	1	0	0	0	0	0	0	0	0							
318	35	18	25	2	2	2	1	2	0	2	4	1	1	8	1	4	4	4	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0
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335	30	20	29	2	1	1	1	1	0	1	5	2			1	3	3	2	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0
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376	55	14	17	2	2	2	1	0	0	1	3	2			1	5	5	5	0	0	0	0	0	0	0	0	0							
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391	35	18	22	1	1	2	1	0	0	1	4	2			1	2	2	1	0	0	0	0	0	0	0	0							
392	42	18	21	3	1	1	1	0	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
393	60	16	19	1	1	2	1	0	0	1	4	1	1	2	2	7	7	7	0	0	0	0	0	0	0	0							
394	51	16	18	1	3	2	1	1	0	1	4	1	2	12	1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
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409	33	16	21	1	1	1	1	1	0	2	4	1	1	9	1	3	3	3	0	0	0	1	4	1	0	0	0	0	0	0	0	0
410	60	21	25	1	1	2	1	0	0	2	4	2			1	5	5	2	0	0	0	3	8	2	1	0							
411	30	18	20	2	3	1	1	0	0	2	4	2			1	2	2	1	0	0	0	1	4	1	0	0							
412	19	19	22	3	4	1	1	0	0	2	3	2			2	1	0	1	0	0	0	0	0	0	0	0							
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417	45	15	19	1	2	1	1	0	0	2	4	2			1	4	4	4	0	0	0	0	0	0	0	0							
418	52	15	16	1	1	1	1	0	0	2	4	1	2	7	2	1	1	1	0	0	0	0	0	0	0	0							
419	25	18	20	2	2	1	1	0	1	1	4	2			2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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445	40	17	25	3	3	2	1	0	0	2	4	2			1	4	4	4	0	0	0	0	0	0	0	0							
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723	32	16	18	3	3	2	1	0	0	2	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
724	60	18	22	1	3	1	1	0	0	1	3	2			1	4	4	4	0	0	0	2	0	1	0	1							
725	35	15	20	1	1	2	1	0	0	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0							
726	30	18	20	3	2	3	1	0	0	1	4	2			1	5	5	6	0	0	0	1	6	0	1	0							
727	22	14	17	4	4	1	1	0	0	2	5	2			2	1	0	2	0	0	0	0	0	0	0	0							
728	30	20	22	3	3	3	1	1	1	1	4	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729	34	23	25	5	5	1	1	0	1	1	3	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
730	35	18	21	3	3	1	1	0	1	1	4	2			1	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
731	26	20	22	2	2	1	1	1	1	2	4	2			2	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
732	40	17	25	1	1	2	1	0	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0							
733	70	16	24	1	1	2	1	0	0	1	4	2			2	3	3	3	0	0	0	0	0	0	0	0							
734	60	15	22	1	1	1	1	0	0	2	3	2			2	2	2	2	0	0	0	0	0	0	0	0							
735	25	18	25	3	3	1	1	2	0	1	5	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
736	30	17	23	3	3	1	1	2	1	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
737	28	17	21	1	1	1	1	1	2	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
738	40	19	22	1	2	1	1	0	0	1	4	2			1	5	5	5	0	0	0	0	0	0	0	0							
739	35	19	28	3	2	2	1	1	0	1	4	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
740	65	14	18	1	1	1	1	0	0	3	3	1	1	4	2	4	4	4	0	0	0	0	0	0	0	0							
741	28	21	28	2	3	1	1	0	1	3	3	2			2	2	1	1	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0
742	65	15	19	1	1	1	1	1	0	2	4	2			2	12	12	12	0	0	0	2	8	0	0	2	0	0	0	0	0	0	0
743	30	18	22	2	3	1	1	0	0	2	3	2			1	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
744	62	15	18	1	1	1	1	0	0	2	4	1	2	9	2	8	7	7	0	1	4	0	0	0	0	0							
745	26	21	23	3	3	1	1	0	2	2	3	2			2	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

746	35	16	20	2	2	1	1	2	0	2	3	2			1	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
748	27	18	25	3	4	1	1	0	0	1	4	2			2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
749	32	20	25	2	1	1	1	0	0	1	4	2			1	3	3	2	0	0	0	1	4	1	0	0							
750	60	15	19	1	1	1	1	0	0	2	3	2			2	3	3	3	0	0	0	0	0	0	0	0							
751	32	17	20	2	3	1	1	0	2	1	3	2			1	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
752	45	16	21	2	3	1	1	0	0	1	3	2			2	1	1	1	0	0	0	0	0	0	0	0							
753	61	15	17	1	1	1	1	0	0	1	4	1	2	9	1	4	4	4	0	0	0	0	0	0	0	0							
754	31	18	21	3	4	2	1	0	0	1	3	2			2	1	1	1	0	0	0	0	0	0	0	0							
755	35	19	20	3	4	1	1	0	0	1	2	2			1	2	2	2	0	0	0	0	0	0	0	0							